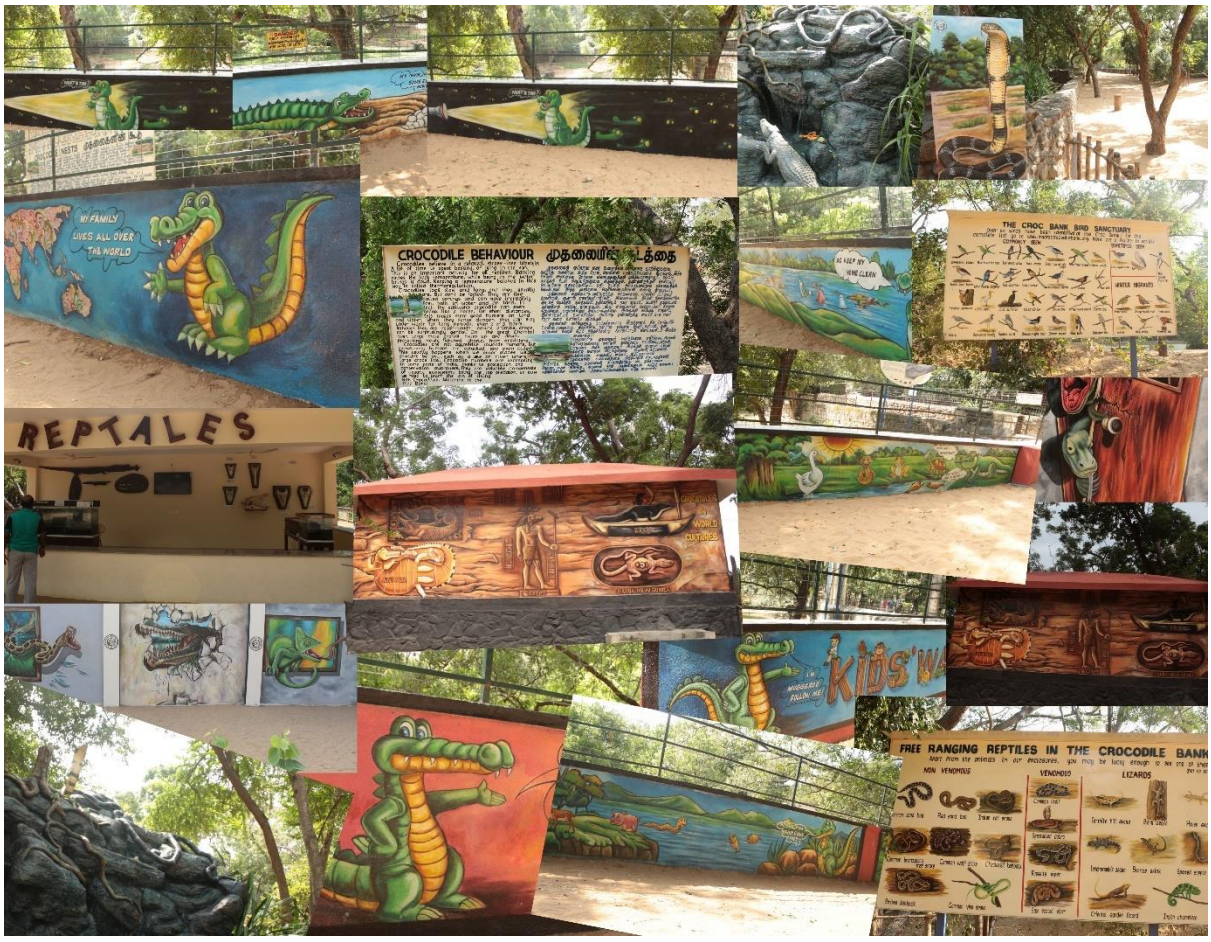
Madras Crocodile Bank Trust

Annual Report- 2017-2018



New signage and exhibits at the Croc Bank…

INTRODUCTION

Another busy and productive year has gone by in the annals of the Madras Crocodile Bank Trust, or "Croc Bank". It was started in 1976 by a group of idealistic conservationists including Rom Whitaker, initially with private funds and a lot of goodwill and support from friends and family, as a desperate effort to save India's dwindling crocodilian populations from extinction. At that time the gharial was particularly endangered, with only 300 or so left in the wild. The mugger and saltwater crocodile were in better shape but hunting and habitat depletion were serious threats for them as well. Today, after 40 years of cutting-edge science/research and grassroots education and awareness building, the Croc Bank is recognized as a world leader in the field of frontline conservation of species and habitats. Its infrastructure and programs include a reptile zoo on the East Coast Road south of Chennai, and field stations and study sites reaching as far afield as the Nicobar Islands. The zoo receives about 4.5 lakh visitors annually, making it one of the popular tourist attractions in the region.

Originally designed to be a living repository of crocodilians for genetic safekeeping, the Croc Bank is now no longer confined to crocodile conservation but includes all reptiles in its mandate and its title includes "Centre for Herpetology". The release of captive bred crocodiles into the wild, which was the original goal, has not happened because of shrinking wilderness areas and the lack of suitable habitats. There are therefore about 2000 crocodiles in residence. The mandate has also extended to crocodilians from other countries, in fact all the world's species, ie 23. Of these, 17 are housed at the Croc Bank currently, the only place in India where such a sizeable chunk of the total species can be seen. Of the 17species represented, 2 are listed as *Critically Endangered* by the IUCN, and 3 as *Threatened.*

In 2003, the Trustees of the Croc Bank decided to expand its mandate and reach, and become a centre for herpetology. Its work now includes the conservation of all reptiles, ie snakes, chelonians and lizards as well. The need for chelonian conservation has grown in recent years and MCBT now breeds several threatened species including 2 that are listed as *Critically Endangered* by IUCN. Field work, namely surveys and ecological studies, are a large part of its activities; in face our core operation is as much a field based conservation outfit as it is a captive gene pool of endangered species.

Over the years, the Croc Bank has developed into a world-renowned conservation NGO with strong community and government support at the local and national level. Apart from its commitment to research and conservation of herpetofauna, it is a recognized resource for environment education and interpretation. Its strength has been to maintain a relatively small but effective operation that is dynamic in action and prolific in results. An example of this is its field station in the Andaman Islands, ANET (Andaman and Nicobar Environment Team).

Shortly after its foundation in 1976, the Croc Bank team realized that there was a serious and urgent need for herpetological surveys and conservation action in the then little-known and neglected Andaman and Nicobar archipelago. ANET was conceived and started, and has since carried out extensive work on marine turtles and marine ecosystems, herpetofaunal

biogeography and many other biological studies. In addition, ANET has also been productively involved in the broader ecological and social spheres, including projects on natural resource utilization, sustainable development and protected areas management. As one of the oldest and most known and trusted NGOs in the Islands, ANET played a pivotal humanitarian role after the 2004 tsunami devastated the region including getting relief supplies to desperate victims. Today, although still active in the herpetological arena, ANET carries out a broad range of environmental work including marine and terrestrial components. It remains the only research base in the archipelago and voices ecological concerns on many local committees which advise government on development policies and assessments. Its education and awareness building work includes programs and presentations for local and mainland schools, colleges and other institutions and groups on the amazing ecology of these islands and the need to conserve it.

This year, the Croc Bank signed a two-year MOU with Dakshin Foundation, Bangalore, to run and develop ANET and this has been a most productive partnership which will have long-lasting benefits for the conservation and research platforms in the Islands.

Another such field station is ARRS, Agumbe Rainforest Research Station. It is situated in Agumbe in the Western Ghats, which was set up by Rom Whitaker in 2005 and is now run by the Croc Bank. It was the result of concern for the king cobra, after field studies on its biology and status. Agumbe is one of the few remaining refuges of the "king". Other iconic herpetofauna in the area, include Draco (flying lizard), pit vipers and several species of endangered amphibians. A black leopard routinely strolls down one of the pathways that adjoins the ARRS campus. Research projects range from frogs to lapwings, and of course the king cobra. A rescue-release project for king cobras is the "call centre" for farms and households in the district, which have now become increasingly tolerant to this occasional visitor, thanks to the public education work being done by ARRS staff. The snake is removed and relocated, and the family/community is given moral support and confidence because superstitions and erroneous fears are negated, and scientific information provided. This has been named the most successful snake rescue services in the country.

2000 kms to the north on the mighty Chambal River, is Garhaita: the base of the Gharial Ecology Project, one of the most long-term and in-depth crocodile studies in the world. Using sophisticated data collection techniques including telemetry, the study is tracking the home ranges and observing the habits of this wonderful and rare animal. Local inhabitants are being trained in these techniques, and the need for conserving the species. Interesting and surprising data and information has emerged about the natural history of the gharial, such as the extensive riverine range of adults and the protection of hatchlings by adult males.

MCBT's education programs include school camps and family activities, as well as hands-on zoo experiences for youngsters such as Zoo Keeper for a Day. There are also presentations in rural schools and this year, with funding from USV Pharmaceuticals, the Croc Bank conducted programs on snakebite and its treatment at schools, colleges, NGOs, government departments and tourist groups. Education is definitely the key to long term sustainable

conservation. We devote a large part of our time and resources towards educating people of all ages and backgrounds on the importance of conserving reptiles and natural ecosystems. Workshops and training programs are also tailor made and carried out for other zoos, schools, colleges, conservation agencies and government departments on topics related to reptile conservation, husbandry and management. These include groups from other countries as well, since we hold husbandry experience for species in those regions (eg the Siamese crocodile).

MCBT's flagship project this year is the snakebite one, which has already made successful inroads in the education, research and data-collection areas. It is in fact one of the most ambitious conservation initiatives we have ever undertaken. There is an extensive report about it in this issue of our 2017-18 Annual Report, which we present with pride and gratitude for our team and partners, supporters and funders.

ADMINISTRATIVE DETAILS-MCBT

Office Bearers

Ex Officio Trustees:

Rom (Romulus) Whitaker (Founder)
Zai (Zahida) Whitaker

Trustees:

Ashish Gupta	Samit Sawhny
Prof Satyajit Mayor, Director, NCBS	Kamini Sundaram
M.M. Venkatachalam	Zhayynn James

Personnel-office and administration

Director	Zai Whitaker
Assistant Director	Allwin Jesudasan
Curator/Research Director, ARRS	Nikhil Whitaker
Assistant Curator/Snakebite Coordinator	Ajay Kartik
Zoo Manager	K K Rajendran
Education Officer	Anjana Srimathi
Zoo Educator	C.V. Arul
Zoo Educator (Feb-April)	Tanaaz Kothawalla
Veterinarian	Dr Arun Pari
ANET -Senior Research Fellow	Dr Manish Chandi
ANET- Operations Manager	Saw John
ANET- Base Coordinator	Adhith Swaminathan
ANET- Marine Research Officer	Mahima Jaini

ANET- Post Doctoral Fellow	Madhuri Ramesh
ARRS- Field Director	Anup Prakash (until May 2017)
ARRS- Research Coordinator	Dhiraj Bhaisare (until August 2017)
ARRS- Education Officer	Ajay Giri
ARRS- Operations	Shankar C.M. (until Sept 2017)
ARRS- Base Manager	S S Jayakumar
ARRS- Research Assistant	Venetia Sharanya
ARRS- Research Assistant	Abhishekh Shirsat
Gharial Ecology Project PI	Dr J.W. Lang
Gharial Ecology Project Coordinator	Jailabdeen A

Accounts, Husbandry and Maintenance

Mr M. Mohan	Accountant
Ms M. Pavithra	Assistant Accountant
Mr K. Kannappan	Senior Ticket Counter Clerk
Mr V. Gangadurai	Chief Reptile Keeper
Mr S. Nagarathinam	Chief Reptile Keeper
Mr S. Sampath	Snake Keeper
Mr R. Thangaraj	Supervisor' Entrance and pen watchers
Mr C. Dhanasekaran	Zoo Educator
Mr L. Gunasekaran	Maintenance Supervisor
Mr V. Mohanasundaram	Curatorial Assistant
Mr T. Mohan	Office Assistant
Mr C. Purushothuman	Senior Office Assistant
Mr N. Selvamani	Ticket checker
Mr R. Gnanamurthy	Ticket checker
Ms M. Indradevi	Senior House Keeper
Ms E. Amutha	Enclosure Maintenance and House Keeping
Ms S. Shanthi	Chelonian Keeper
Ms J. Parimala	Enclosure Maintenance
Mr M. Ramu	Driver
Mr S. Janakiraman	Animal Keeper
Ms N. Pushparani	Croc Shop Operator
Mr G. Ashok Somai Magar	Chief Cook
Mr S. Mohan	Cleaning and Maintenance Asst
Mr G. Gowri Shankar	Animal Keeper
Mr Tek Bahadur Somai Magar	Security Guard
Mr Budibal Somai Magar	Security Guard
Mr Krishna Bahadur Somai Magar	Security Guard
Ms V. Yuvarani	Maintenance and Cook
Ms A. Kumari	Maintenance and Cook
Mr K Elumalai	Maintenance Assistant

Research

Gharial: Dr J.W. Lang, Jailabdeen A, Pankaj Kumar, Ashutosh Tripathi
Human Ecology-Nicobars: Dr Manish Chandi
Snakebite, Venoms: Rom Whitaker, Gerry Martin
Marine Conservation: Muralidaran Manoharakrishnan, Adhith Swaminathan, Ridhi Chandarana, Allisa Barnes, Hari Prasath, Deepa T, Hugo Francisco de Souza, Trisha Gupta

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ACTIVITIES AT THE CROC BANK

Padma Shri award for Rom Whitaker, Founder-Trustee

Rom Whitaker was awarded the Padma Shri award in the 2018 Republic Day honours, for his "exceptional and distinguished service in the field of wildlife conservation." The Croc Bank congratulates him and is delighted to be working with him on several projects. There will be a function on May 21st at the Croc Bank to honour him.

Additions to exhibits

Several new exhibits have been added to the zoo, including a reptile-motif sculpture, depicting species that live in the Western Ghats where MCBT has one of its field stations (ARRS). Ten reptiles and amphibians are represented including of course the king cobra. Several small waterfalls run down the rock, giving it a feel of the rain forest.
The Komodo enclosure and its signage was completed, and is now inhabited by Smog, who is enjoying his new spacious home with several different micro habitats where he can avail of sun, shade, shelter and water as and when it suits him. The Komodo selfie wall, adjoining the enclosure, is also a big hit.
A new mural on the Pen 8 wall depicts the natural history of the mugger, written and illustrated especially for children. Murals have also been completed on the water monitor enclosure wall. The entrance to the Croc Bank has been rearranged and looks more spacious and attractive. Other additions are stone pillars with reptile motifs carved by local artisans, a new watchman's bunk and ticket booth, and a parking space for volunteers and guests.

New restaurant underway

Work has been completed on the café above "Reptales", our interpretation centre. With large windows on all sides, it has a great view of crocodiles, birds and trees. It should be open to the public in the near future, and visitors will be able to enjoy a cup of coffee while observing social interactions in Pen 10, or a monitor lizard climbing down from a branch. The interpretation centre, which was closed for several months while the café was being constructed, is now open to the public again.

Accessibility

One of the Croc Bank's information booklets, "Croc Talk", has now been produced in Braille and will be available to visually impaired visitors. The wheelchair is being further modified to improve its manoeuvrability in the sand.

Waste Management

A heap of compost, collected over many years, was finally trucked away to a neighbouring farm, and arrangements made for efficient composting and its use at the MCBT campus. Further, a new system of bio septic tanks were installed at all the toilets including the visitors' toilets, for efficient and hygienic use and maintenance. In all 17 filling and 27 non-filling tanks were installed by KG Cements, between 5th to 20th February. The recommendations made by the William J. Clinton Fellow Avan Antia last year, regarding solid and liquid waste management, are being implemented.

Staff Professional Development

Assistant Director Allwin Jesudasan attended a workshop conducted by Oracle, a conference organised by Deshpande Foundation and a summit organised by Google. At the Oracle workshop he networked with other grantees and learnt about Oracle's expectations from us. Story telling through pictures and videos was a key take- away from the workshop. At the Development Dialogue organised by Deshpande Foundation, Allwin had the opportunity to discuss the ARRS work and aspirations. At the Google summit he learned about several technologies such as ODK, Google Earth Engine, Google Voyage, Google 360, Machine learning and Youtube. We are in the process of using some of the learning at the Croc Bank. For example, the King Cobra telemetry data is being collected using ODK.

Curator Nikhil Whitaker gave a talk on crocodile biology at the Central Marine Fisheries Research Institute, and attended a seminar on wildlife forensics at the Centre for Cellular and Molecular Biology, Hyderabad. On March 16th he gave the plenary lecture on mugger biology and human-croc conflict, at the International Seminar on Coastal and Marine Biodiversity and Conservation (ISCMBC-2018) at the Centre for Advanced Marine Sciences, Annamalai University. Nikhil has started started his PhD study on seasonal movements of size ranges of mugger crocodiles on the Cauvery River. It will include human-croc conflict, and the species' dry season strategies (such as burrows) and isolated water bodies.

Assistant Curator Ajay Kartik attended the ZIMS workshop organised by the Central Zoo Authority, in March. He is coordinating MCBT's snakebite mitigation project.

Zoo Educator Arul V participated in the Herpetology Course run by the Bombay Natural History Society from June 2017 to December 2017, an interesting online course which also has field visits and workshops. One of the field visits was to Amboli, which was a great opportunity to see some of the unique amphibians and reptiles of the Western Ghats.

Education Officer Anjana Srimathi is currently doing the 12-week DESMAN course at Jersey Zoo (Durrell Endangered Species Management Course). This year, there are 15 students participating from Nigeria, Samoa, Canada, Brazil, Sri Lanka, Hong Kong, Indonesia, Armenia, St. Lucia, Seychelles, UAE and India. The course covers a broad range of current conservation topics through theoretical and practical skills. The course is officially validated as a 'Graduate Certificate' by the University of Kent. The students also gain a separate leadership qualification from the Chartered Management Institute, UK. Some of the topics covered are:

- biodiversity and drivers of species decline
- conservation planning and priority setting
- the role of zoos and captive breeding
- principles of animal husbandry
- conservation medicine and wildlife disease
- small population biology and genetics
- in-situ conservation techniques
- management and leadership skills
- facilitation and team skills
- GIS for conservation managers
- captive and field research skills
- education and community conservation
- fundraising and financial management

Mr T. Mohan, Office Assistant, accompanied the Snakebite Mitigation Team to Tirunelveli and assisted with the program and networked with other NGOs in the area.

Workshops and Training at MCBT

Workshops and training programs were conducted for numerous groups at MCBT, ANET and ARRS including for Forestry students from several states.

Visitors

Several media, film, tv personalities and senior government officials visited the Croc Bank this year including Justice Ajay Kumar Sikri, Supreme Court of India, and Dr.Rajendra Kumar I.A.S, Principal Secretary/Industries Commissioner and Director of Industries and Commerce**.**

Publicity and Media

The Croc Bank received substantial publicity and recognition in the media, including newspapers and magazines, television and on-line platforms. MCBT now has 8706 friends on Facebook, 480 on Twitter ad 1040 on Instagram. Our Goodwill Ambassador Yamini Bhaskar continues to play an active part in this and other initiatives connected to our development, for which grateful thanks. Below is a list of some of the articles about the Croc Bank and its work, in the print media.

1. *Battling the Venom* – DNA Magazine, 30 July 2017
2. *50,000 People a Year Die of Snakebite in India* – The Hindu (Tamil), 9 August 2017
3. *Shocking!* Dinamalar (Tamil), 9 August 2017
4. *Training About Snakes for Fire and Forest Department* – Dinamani Thirunelveli (Tamil), 9 August 2017
5. *Snake Awareness Training in Mundanthurai* – Dinamani Thirunelveli (Tamil), 9 August 2017
6. *50,000 People a Year Die of Snakebite in India* – Dinakaran (Tamil), 9 August 2017
7. *Giant Lizard at Madras Crocodile Bank* – Thinamani (Tamil), 22 September 2017
8. *Giant Lizard Arrived at Madras Crocodile Bank* – Dinathanthi (Tamil), 21 September 2017
9. *Giant Lizard Arrived First Time in India at Madras Crocodile Bank* – Dinakaran (Tamil), 20 September 2017
10. *Snakebite Mortality Under – reported in India, Says Romulus Whitaker* The new Indian Express/Tirunelveli, 09 August 2017
11. *Komodo Dragons on Display at Crocodile Bank* – Deccan Chronicle, 15 September 2017
12. *Komodo Dragons from US on Display at Croc Bank* – Times of India, 15 September 2017
13. Exploring the city, Crocodile at Madras Crocodile Bank – The Hindu, 12 September 2017
14. Weather update, mow part of wildlife management – Deccan Chronicle, 14 November 2017
15. *Rain at Bay, But Croc Bank in Disaster Mode* – The Times of India, 22 November 2017
16. *Croc Ahoy!* Child friendly News – Vol.5, Issue.15, 11 January 2018
17. *Six from T.N. honoured with Padma Awards*- The Hindu, 26 January 2018
18. *Let's Do Something About Conservation Instead of Just Talking About It*- Times of India, 02 February 2018
19. *Whitaker Awarded the Padma Shri* - The Hindu, 04 February 2018.

Curatorial

5 gharials and 4 Indian pythons were donated to the Mysore Zoo in September, and several exchanges are underway.

Ajay Kartik has been coordinating the snakebite mitigation project and conducted workshops for the Forest Department staff at the KMTR and Sathyamangalam Tiger Reserve; he also assisted with venom collection work in Maharashtra.

Nikhil Whitaker's note on the reproduction of Northern river terrapins *(Batagur baska*) was published in the Turtle Survival Alliance newsletter. Ajay Kartik's note on *Dryocalamus nympha* reproduction was published in the Herpetological Review (48 (4): pg 851).

"Turtle Haven" is now active and on display, after the exhibits were rebuilt and new signage created. The UV filter was serviced and is in action again, with a new shed to protect it from the elements.

With the purchase of an ultra-sound scanner, the vet lab is now completely equipped, in its new building donated by Ambadi Pvt Ltd.

Several filming teams were helped to get natural history footage including Showrunner Productions.

Komodo target training continues, and is helping to make husbandry tasks easier and safer.

Talks and presentations were given by the Curatorial team to several batches of Forest Dept trainees from different states, and students from colleges and universities.

Education and Awareness Building

Tours and demos: The night safari at MCBT has become popular and we have been getting a steady increase in the bookings, averaging about 130 visitors per month. It provides a unique perspective of reptiles, especially crocodiles. Seeing the orange glow of their eyes in torchlight is an unforgettable experience. Because it is usually a small group led by one of our Education staff, there is plenty of opportunity to ask questions about reptiles and their conservation and people go away inspired. Many have become donors or adopted an animal.

Guided tours were also provided to special guests and visitors .

Docent program: The docent program continues to be an asset to the staff and development of the Croc Bank. We had close to 100 day-visit contributions from docents in 2017. They have been helpful in environmental day celebrations, quizzes, snake walks, camps, and maintenance activities. A new recruitment was held in March. There were ten shortlisted applicants and 7 have been selected. Below is a short overview of the program written by Kaushik Shelat, MCBT's docent coordinator. People like Kaushik, who work gratis for the Croc Bank, are crucial and much appreciated; a big Thank You to them all.

Back when we started the first batch of docents in June 2009, we were a bunch of young enthusiasts who loved animals and wanted avenues to be involved with them. Over the years, many such youngsters have joined the program and found it a great way to learn, share and grow.

The docent program at MCBT is a brilliant way to create outreach and tap into the hearts of many animal lovers who need a platform to cultivate their passion for the 'scaly monsters'. It

has proved to be an effective method to spread awareness and understanding, and even kindle a fondness towards these misunderstood animals.

From my personal experiences at MCBT during the reptile talks, I have seen how people's expression and body language changed to positive, as they learned more about reptiles and realised their importance in our ecosystem.

My high points have been when I see children coming up with questions, and connect our reptile talks to the bits of information they have picked up in school, on television and from stories from friends and family. Some end up nagging their parents to have crocs as pets! The fact that the docent program is able to contribute to an individual's respect and understanding of non-human life is a great achievement.

As for the docents who have come and gone over the years: the program has helped a good number of them find their calling in life. It has provided them with a platform to establish connections, gain experience and knowledge and move ahead with what they love doing. We've had physicists from IIT and those working with large tech corporations, some of whom even leave it all for the lure of the wild. Giggling zoology undergraduates arrive as docents and go on to get a Master's degree and PHD in environment/zoology/ etc…. Some docents are serious techies who help MCBT with experiments and technology. Some are terrified at first, especially about talking to visitors about reptiles and their conservation, but go on to learn important life skills thanks to the support and encouragement at the Croc Bank. Experiences like the trip to Agumbe a few years ago, help docents who want to pursue ecology/zoology related subject careers, and get a glimpse of the life and experiences they would have if they chose to follow their passion in ecology/zoology.

The docent program is probably one of the best ways for outreach, because it allows the Zoo staff, researchers, students, visitors and the regular Joe to interact one to one and share information and the need for conservation while receiving instant feedback through questions and discussion.

We hope to keep developing the docent program and have a team of committed docents who can be called upon to help MCBT with initiatives in the future.

Education programs: The MCBT Education Department runs awareness programs on- site and at schools, colleges, NGOs and other venues with the assistance from the Curatorial Department. Additionally, the volunteer and docent programs encourage and train students and professionals in conservation work. Many volunteers from the past are now in focal positions in research and conservation, and there is constant feedback that the Croc Bank experience was central to their continuing involvement and achievement in this field.

A brief report on the activities conducted this year:

The Junior Herpers for a Day (half day) camp was held on June 4th, 2017, and a Junior Herpers for a Day (full day) camp on August 20th, 2017.

Programs- 2017

1. *What's That Reptile? Series*
    - Snakes and Lizards – May 13th and 14th
    - Juniors – May 23rd and 24th
    - Crocodiles and Chelonians – May 27th and 28th
    - What's that Lizard? – May 14th and 15th
2. What's That Reptile? Junior Series – May 11th and 12th
3. Junior Keeper for a Day camps – April 30th, June 4th, July 30th, August 20th, September 10th, October 22nd, December 24th
4. Zoo Snooze (Adults) – June 24th and 25th
5. Snake Walks – September 17th, November 5th
6. Vruksha Montessori 2 Day camp – September 1st and 2nd
7. George Washington University(GWU) workshop – July 25th
8. PRIST University workshop – July 21st
9. USV Pvt. Ltd. School workshop – August 29th
10. Orchid School camp – April 23rd and 24th, October 20th and 21st
11. Birthday celebrations – July 30th, September 10th, October 7th, December 3rd, December 27th
12. KFI school workshop – September 15th
13. Know Your Reptile sessions and Guided Tours have been conducted for interested visitors throughout the year

Programs- 2018

1. Junior Keeper for a Day camps – February 18th
2. Junior Herpers / Half-day camps – February 25th
3. Snake Walk – January 14th, February 11th

Feeding demos and talks were done on Sundays at 11:30 am, 12:30 am, 4 pm and 5 pm. The JAWS feeding talk was conducted at 4.30 pm every Sunday. Feeding talks for the Komodo have been started as a trial on Saturdays at 3.30 pm. Snake talks were conducted on Saturday and Sunday. Docents assisted in educational talks, husbandry work and maintenance under the supervision of the Curatorial and Education department. Educators were present during the week to interact with visitors. During feeding demos, educators and docents interacted with visitors, giving information and answering questions.

Events and Environmental Days

The following days were celebrated at Croc Bank with scheduled talks and activities

2017

1. Earth Day – April 22nd
2. World Turtle Day – May 23rd
3. World Croc Day – June 17th
4. World Snake Day – July 16th
5. World Tomistoma Day – August 5th
6. Independence Day – August 15th
7. World Wildlife Week – October 2nd to 8th

2018

1. World Wetlands Day – February 2nd
2. World Wildlife Day – March 3rd
3. Valentine's Day - 17th February

Adoption Program

The following animals were adopted this year (April 2017 to March 2018):

S.No:	Species Adopted	Number of individuals	Adoptee name	Amount
1	Tomistoma	1	Amit	13,750
2	Aldabra Giant Tortoise	1	Sushma Bharath	20,000
3	Aldabra Giant Tortoise	1	Owais Hussain	20,000
4	Painted Roof Turtles	2	Momi Mukherjee	5,000
5	Gharial	1	Yamini Bhaskar	10,000
6	Aldabra Giant Tortoise	1	Usha Badrinath	20,000
7	JAWS	1	John Daniel	40,000
8	Green Anaconda	2	Sreeram Ramachandran	30,000
9	Saltwater Crocodile	2	Aaryansh Pandhe	20,000
10	Indian Tent Turtle	3	Anoushka Pandhe	5000
11	American Alligators	2	Saravanan Uddayar	45,000

12	Siamese Crocodile	2	Arul Kirubakaran Mathiazhagan	20,000
13	Indian Star Tortoise	3	Dr. Raj Kumar	18,000
14	Gangetic Softshell Turtle	1	Aahana	5,000
15	Gharial	2	Nithya Sundarraj	20,000
16	Indian Rock Python	3	Pramod Balaji	30,000
17	Reticulated Python	1	Dr. Raj Kumar	15,000
18	Aldabra Giant Tortoise	1	Yuvan Raman	20,000
19	Yacare Caiman	3	Yatish Lele	15,000
20	Nile Crocodile	3	Kumarraj and Sanjith Kumar	25,000
21	Northern River Terrapins	5	Alexandra Creado	10,000

Volunteer and Docent Program

7 volunteers worked on various research projects and education programs.
The list of current docents is below:

S. No:	Name	Batch
1	Kaushik Shelat	2009
2	Dr. Raj Kumar Jayapal	2014
3	Sundar Vignesh	2014
4	Subhiksha Maxima	2015
5	Dhiresh Mohapatra	2012
6	Nikhil Shankar	2017
7	Karthik Ashok	2017
8	Dilip R	2017
9	Manasi Ravindranath	2017
10	Praveen.H.N.	2017

Interns: Edoardo Bardi - Faecal sample collection and analysis of muggers, chelonians from 11th May to 10th June 2017

Kimberley Deridder - Density-based viability of Mugger crocodile (*Crocodylus palustris*) eggs. 1st March to 31st March 2017

I N T H E F I E L D

Agumbe Rainforest Research Station (ARRS)

KING COBRA TELEMETRY PROJECT

An exciting event has started in ARRS, one of the "firsts" in the world of reptile research and conservation in India. Agumbe, in the south-western region of the Western Ghats is an IUCN-designated biological hotspot with many endangered and endemic species including the King Cobra. This is where MCBT's field station ARRS is located.

Ophiophagus hannah is a world-renowned star among reptiles. Apart from its limited and dwindling habitat, its unique life history includes nest-building (the only snake to do so) and feeding on other snakes (mainly spectacled cobras and rat snakes). Like the tiger, the king cobra is a flagship species: an iconic animal of the region, an apex predator, and a crucial indicator of the health of the ecosystem. In the Western Ghats- one of the few king cobra habitats in the world- these snakes inhabit undisturbed patches of rain forest with little or no human disturbance.

But this 5 star habitat that is fast disappearing! However, because of the work of the Madras Crocodile Bank over the last decade, the local community is becoming tolerant and even friendly towards king cobras. Local cultural beliefs plus the Croc Bank's conservation initiatives, has created a community which comfortably shares its home with the "King." These snakes are no longer killed when encountered in houses and fields; instead, a call is put through to the ARRS rescue centre, which responds with a visit, reassurance, and (if necessary) capture and relocation. However, there is more and more acceptance of the leave-it-alone strategy, where nothing is done except observing the movements and location of the snake. This education-based rescue program has saved many king cobra lives, and earned the appreciation of the international reptile conservation community including the global King Cobra Conservancy.

In mid February 2018, another important chapter of the king cobra conservation project began. Permission had been received to carry out the second phase of our research on king cobras using radio telemetry and PIT tags from the Govt. of Karnataka and the PCCF (Wildlife), Karnataka. On Feb 2018, Dr. Arun Pari, MCBT veterinarian, carried out surgeries on two king cobras, a female and a male (F2 and M5), to implant transmitters in them. The two snakes have been released and two teams comprising of two volunteers each are tracking the two radio-tagged snakes, through their activity period to observe day to day activity, movement and interactions. The study will help to gain considerable knowledge on the ecology and behaviour of the species. It will also provide ample opportunity to communicate with communities living in the region and conduct awareness programs on a regular basis while following the king cobras through this largely human -dominated landscape.

Ajay Giri, Education officer at ARRS, is carrying forward his wonderful work on educating people on the ecology of the area, especially that of king cobras. He continues to resolve human-wildlife conflict in the region. A summary of the conflicts resolved is provided in Table

1. Since Jan 2018, he has been implanting PIT tag on rescued king cobras. The PIT tags help in determining habitual conflict animals and potentially determine population. Since January, we have tagged 30 king cobras.

Snake Species	Rescued	Visited/Monitored	Total
King cobra	129	13	142
King cobra hatchlings	15	-	15
Python	12	1	13
Python hatchlings	_	17	17
Spectacled cobra	52	-	52
Krait	1	-	1
Rat snake	5	1	6
Montane trinket snake	1	-	1
Leopard	1	-	1
Total	216	26	248

Table: Conflicts resolved

ARRS' continues its existing partnerships such as that with the National Centre for Biological Sciences. One of their projects concerns the population trends in moths, and every month on new moon day, moths are surveyed on the field station's campus.

A group of 30 MSc students from The Energy and Resources Institute, Delhi came to ARRS between 5th to 10th March 2018, for a field course in ecology. Nikhil Whitaker, Research Director of ARRS, presented and facilitated the course work for the group and also helped them carry out small research projects. At the end of the course, teams presented their research projects to ARRS and TERI staff.

We continue to explore new partnerships in research, education and conservation. Dr. Jason Chapman and Dr. Dave Hodgson of Exeter University visited ARRS to explore the possibility of conducting their field course at ARRS in 2019.

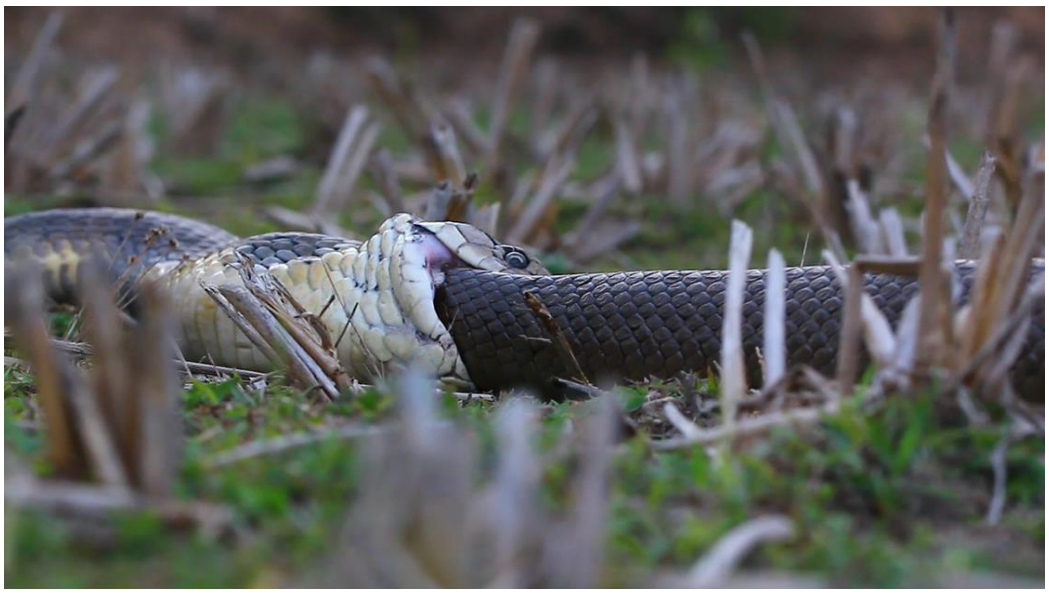
The educational programs have continued this year.

Date	Target audience	No. of people Addressed
28/12/2017	High school students and locals	110
19/12/2017	Forest department recruits	140
14/11/2017	High school students, locals and FD	125
09/11/2017	High school students and FD	80
28/08/2017	Local communities	250
27/08/2017	Local communities	250
26/08/2017	Local communities	200
20/06/2017	Forest department recruits	130
	Total	**1285**

Table: Education program details

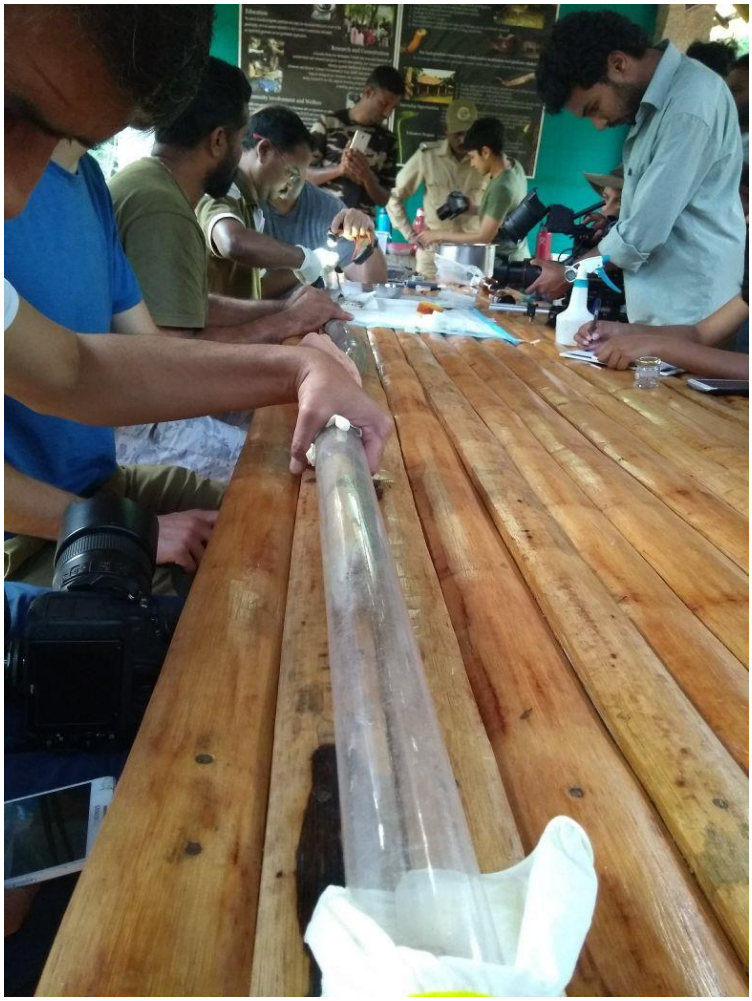
Several renovation works were carried out this financial year. Primarily, the roof-frame of 'Kalinga Mane' was replaced and the walls as well as the floor were repainted.

A group of 20 volunteers from Avirata and Oracle helped plant 500 forest trees of 7 species in ARRS. Some members of the group donated towards a telephone signal amplifier and also a bike to be used during the King Cobra Ecology Project.

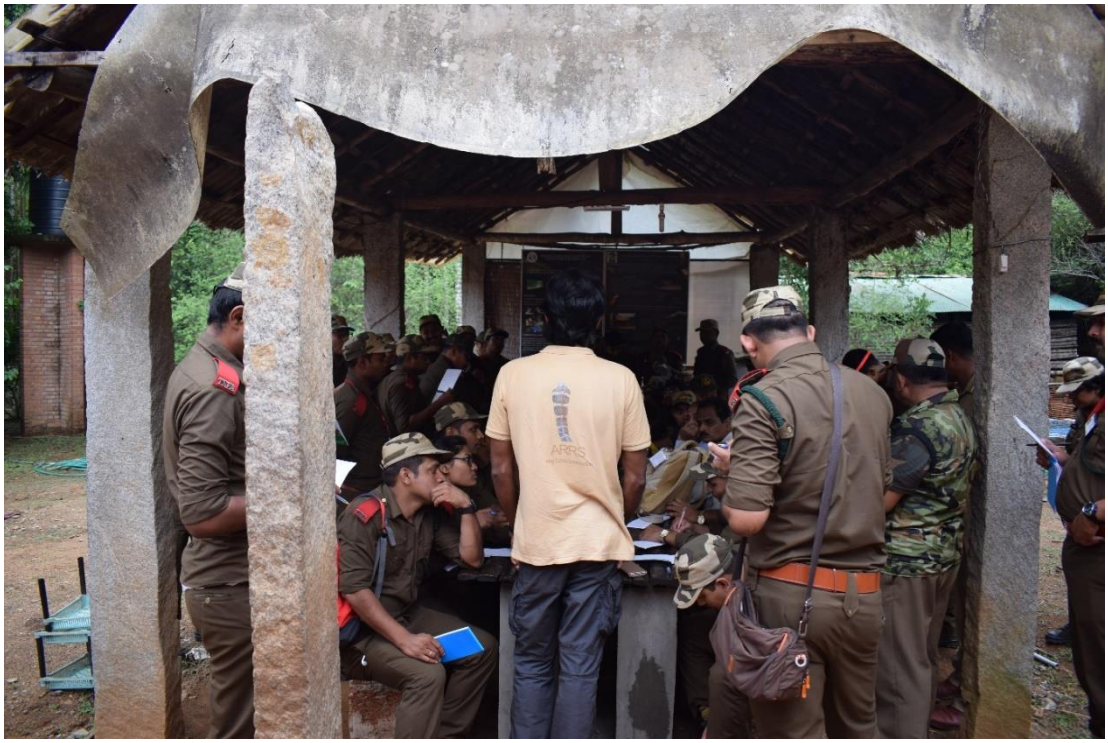


One of the tagged king cobras (F2) eating a rat snake *Photo: Ajay Giri*

On the occasion of the 18th annual celebration program conducted by the Udupi district Forest Department officials, Ajay Giri was felicitated for MCBT's king cobra research, conservation and social work.

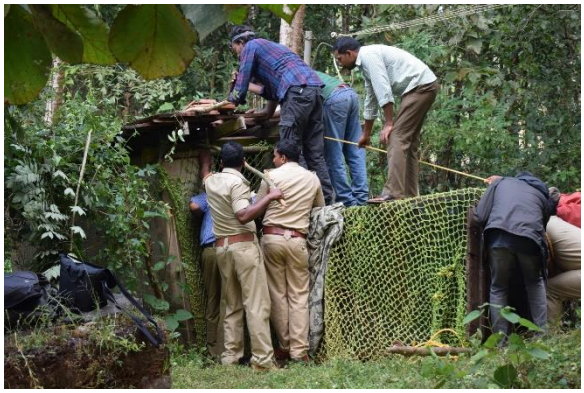


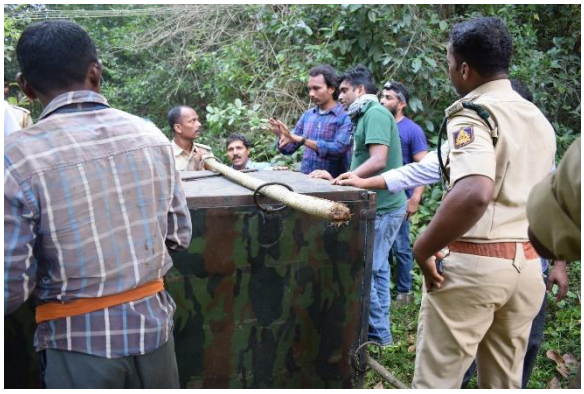
Dr. Arun Pari performing the surgery on a king cobra in the presence of Forest Department staff

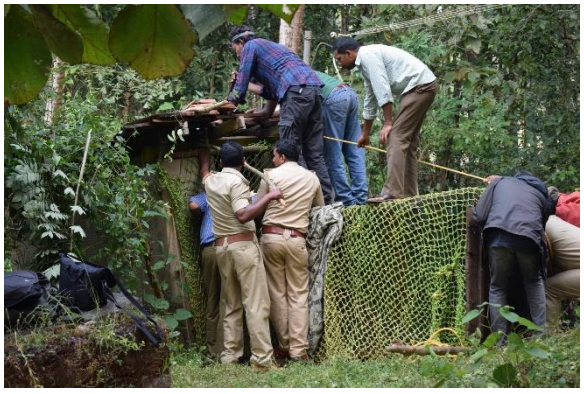


20/06/2017: Interactive session with forest department recruits

Awareness program for school students in Sitanadi Nature Camp







Photos: ARRS

On 18/11/2017, ARRS staff helped during the rescue of a snared sub adult leopard

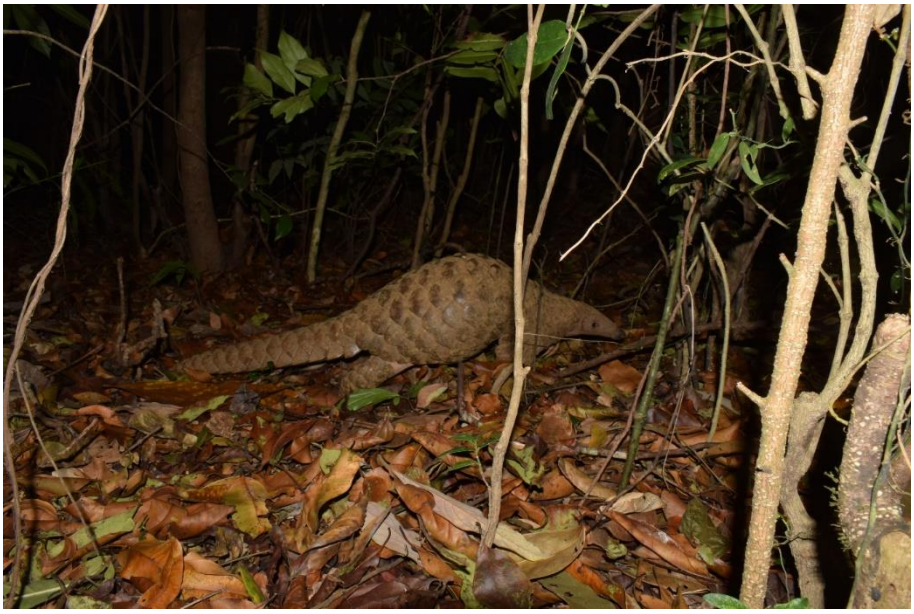


Photo: Ajay Giri

A pangolin was sighted behind Leopard cottage at ARRS on Jan 23

Snake Conservation and Snakebite Mitigation

Snakebite is top on the list of the World Health Organization's Neglected Tropical Diseases and there is precious little being done to mitigate these tragedies that primarily affect the farmers and rural poor of India. Snakebites are accidents that can be avoided and can be treated by the single effective treatment: Antivenom. 50,000 people die of snakebite in India every year. This tragic and shocking number is the result of ignorance (wrong "treatment"), and shortage and lack of efficacy of antivenom. The Croc Bank has been concerned and active in this area since its foundation in the 70s, and now, thanks to USV Pharmaceuticals, INFOSYS Foundation and Deshpande Foundation, it has undertaken a Snake Conservation and Snakebite Mitigation Project that is hard at work on several fronts. These include collecting venom samples from around the country to carry out tests to determine the efficacy of Indian antivenoms, to map the occurrence and abundance of the Big Four deadliest snakes of India (cobra, krait, Russell's viper and saw-scaled viper) creating and disseminating a countrywide education programme and creating phone apps for the location of the nearest source of antivenom and medical help if snake-bitten.

Other solutions to this massive health burden to the rural poor include the improvement of venom production, which is the base ingredient for the production of antivenom and to improve the antivenom produced in India both in cleanliness (to avoid allergic reaction to horse serum) and raising antivenom titre so that less antivenom is needed to treat a bite,

As an important part of our education/outreach programme we have recently produced 3 short videos on the subject which are now being dubbed for distribution in all regional languages in India (links below).

4 Deadliest Snakes of India <https://www.youtube.com/watch?v=0aUl-jQsLWs>

Snakebite <https://www.youtube.com/watch?v=DHXbr9gy6N4>

Snake Rescue – The Expert Way <https://youtu.be/scDGVAFVk4c>

Working with a long list of partners (see Affiliated Institutions), MCBT is navigating this important project with all the expertise, energy and network at its command and the results so far are summarized below:

Education & Outreach

- Summary of school programs conducted about snakebite and its correct treatment.

Organization	Location	Number of school programs	Number of attendees in total	Notes
MCBT	Kanchipuram	10	1500	All visits were to government middle and high schools in agrarian areas of Kanchipuram district.
Keystone Foundation	Nilgiris	8	750	
CEE	Chennai and Virudhunagar	3	3700	7 programs were conducted in Virudhunagar for Farmer Producer organizations with 500 farmers attending each session.
ATREE-ACCC	Tirunelveli	11	2200	
SAWWCT	Pondicherry	15	2500	
Wild Wings Trust	Coimbatore	5	450	
KANS	Hosur	10	1500	
Total		**60**	**12600**	

- On 5th October, 2017 MCBT conducted a workshop along with WWF-Western Ghats Landscape team for forest guards and rangers of Sathyamangalam Tiger Reserve which covered all ranges of the Reserve. Over 150 FD staff attended the sessions.
- MCBT and Centre for Environment Education conducted a teacher training workshop on Snakebite Mitigation and First Aid on 22nd November which was attended by 256 teachers.
- MCBT and ATREE together with the Rotary Club conducted a teacher training workshop at Manjamal Hr Sec School.
- 6 second-year MBBS students from CMC, Vellore have taken up snakebite mitigation and education as their rural outreach elective subject, and under guidance from their faculty and MCBT personnel, will work in villages around Vellore for 6 months starting March 2018.
- The education project and its outcomes were presented as a poster in December, at Snake Symp 2017, a Toxicology Society of India conference at CCMB (Centre for Cellular and Molecular Biology), Hyderabad.

Venom Sample Collection & Testing

- Venom samples have been collected in Maharashtra (19th-24th September) and Madhya Pradesh (7th-19th October) as per the permits issued by the respective states.
  Applications for collection permits have been made for the states of Andhra Pradesh, Gujarat, Bihar and West Bengal.

As of now, permits have been received from Andhra Pradesh and West Bengal and sample collection will be carried out in both states over the coming months.

- The latest set of test results from VIT has been summarized in the table below

Summary:

ED_{50} (mg / mg venom)	Bharat Antivenom		VINs Antivenom	
	Dry wt	Prot. Conc	Dry wt	Prot Conc
	6.41	58.44	6.61	78.57

Media highlights:

We officially launched our training video '**Snake Rescue – The expert Way'** to the public via social media channels (Facebook, YouTube) on September 13th and it has gained quite a lot of visibility. Some statistics are below -

Total views (Facebook + YouTube) – 98, 000 and counting
Total shares – over 2000 and counting

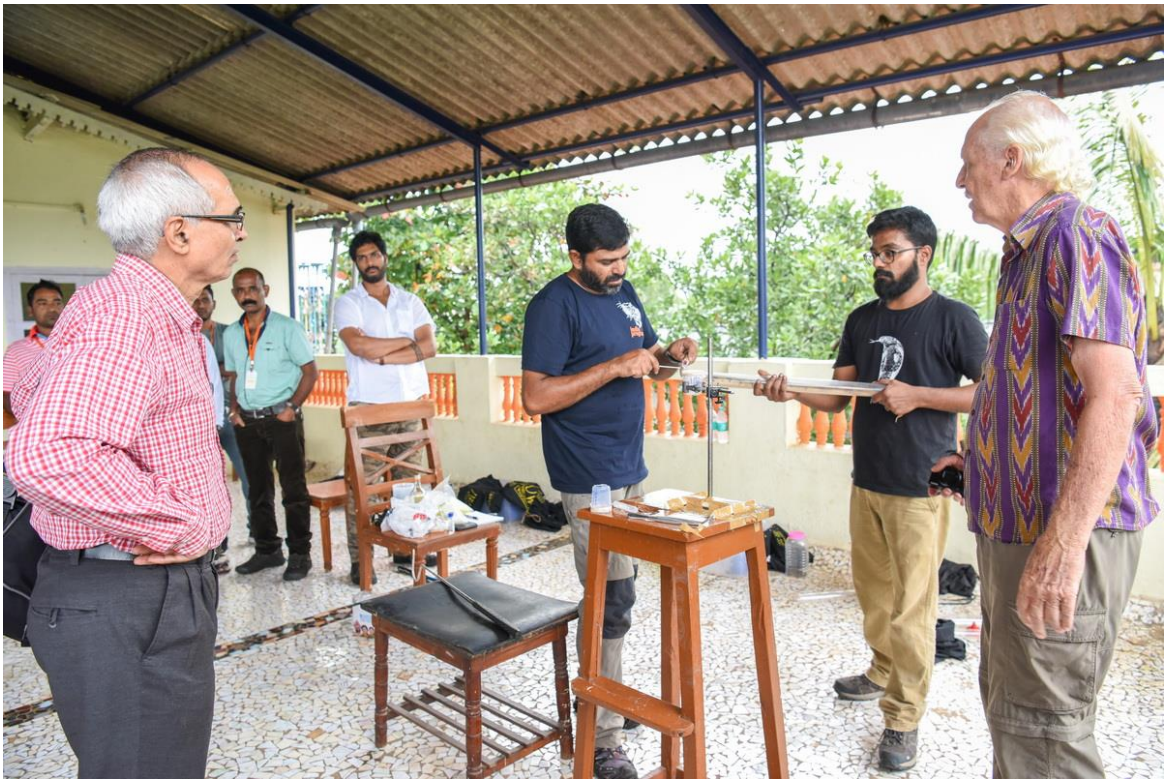
In a special feature, SUN TV telecast a program on Snakebite on August 17th.

Through 'Radio Kotagiri', a community radio initiative of Keystone Foundation which covers over 2000 families in the Nilgiris, radio messages have been created about snakes and snakebites which will be routinely broadcast in between the regular programming.

The Hindu covered MCBT's venom sampling trip to Maharasthra.

http://www.thehindu.com/news/cities/mumbai/search-for-a-highly-potent-anti-snake-venom/article19771374.ece

Training for Forest Department staff in Sathyamangalam Tiger Reserve by MCBT



Venom sampling underway in Maharashtra *Photos: MCBT*

ANET (Andaman and Nicobar Environment Team)

Since April 2017 Dakshin has been sharing the responsibility of administering the Andaman and Nicobar Environment Team (ANET) with the Madras Crocodile Bank Trust (MCBT). The two organizations have worked closely to take ANET forward along its vision-path of research, conservation and education in this ecologically fragile archipelago. It has been a busy and productive year:

Education:

This season ANET conducted 8 school programmes for students from the islands as well as the mainland that ranged from day visits to week long courses. ANET also conducted 2 short college level programmes and 2 longer duration college workshops. Island ecology and sustainability remains a focal theme in all the programmes irrespective of the programme length, class size and age distribution. The programmes stress the importance of field based learning and experiential education and helps inculcate independent thinking and problem solving. In the near future we hope to develop laboratories and work spaces for researchers and research affiliates, which can benefit both the researchers, visiting scientists and students. Details on ANET school and college programmes have been provided in the following table.

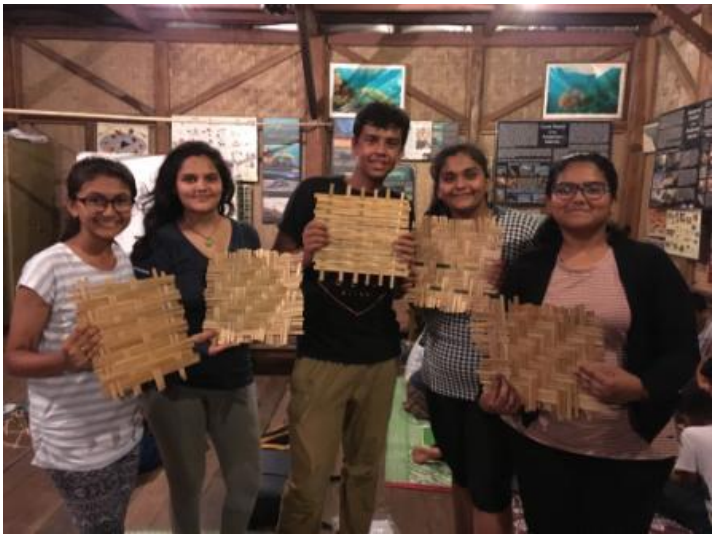
Year & Month	Type	Programme Name	Primary Institution	# of Students	Duration	Stay
2017 August	School	Raksha Bandhan & Environmental Protection	Coastal Green Zone	20	1/2 day	Day visit
2017 September	School	From Farm to Fork	American International School, Chennai	14	1 week	Night stay
2017 October	School	ANET Island Ecology	Travel Stall	27	1 day	Day visit
2017 October	College	ANET Island Ecology	Davidson College, USA	9	2 days	Day visit
2017 October	School	ANET Island Ecology	Carmel Senior Secondary School, Port Blair	19	1 day	Day visit
2017 October	School	ANET Island Ecology	Orchid School, Pune	20	1 week	Night Stay
2017 November	College	ANET Island Ecology	Cotton University, Guwhatti	10	2 days	Night Stay
2018 January	School	Wipro Award Winners	Wipro Earthian & 5 Port Blair Schools	20	4 days	Night Stay
2018 January	School	Foliage	Foliage Outdoors	60	1 day	Day visit
2018 January	School	ANET Island Ecology	Redwood Edutours	27	2 days	Day visit
2018 February	College	Enduring Andamans	University of Technology Sydney	5	2 weeks	Night Stay
2018 March	College	Workshop on Tropical Marine Biology and Ecology	Department of Biotechnology	15	2 weeks	Night Stay

Open Day: to strengthen relationships with local villages, ANET organised its first Open Day on February 4th 2018 to celebrate and communicate 25+ years of research to the local community. The half-day programme saw 15 researchers display their research in a simple, interactive manner along with their respective field assistants. Dakshin's Arts and Community Engagement (ACE) team created a craft corner for the younger visitors. We estimated that approximately 130-150 locals visited ANET during the 4 hours that our gates were open. A photographic timeline depicted ANET's history from 1975 to present day, enabling certain visitors to reminisce about their or their family's associations with ANET over the course of time.

Visiting School Groups -Highlights

Through the course of the 2017-2018 season, ANET saw a total of 8 school programmes come through for varied durations. Programmes were developed for these programmes based on their length of engagement, their age group, and their specific interests. As a first, three local Port Blair schools stayed at ANET as part of Wipro earthian's Continuing Engagement Programme. The camp which ran from the 18th to the 21st of January, was a basic introduction to the ecology of the islands giving students first hand experiences which many of them have never accessed before. An official report has been submitted to Wipro and will be distributed

to the three schools that participated including Carmel Senior Secondary School, Navy Children School and Kamaraj High School all of which had participated in Wipro earthian.

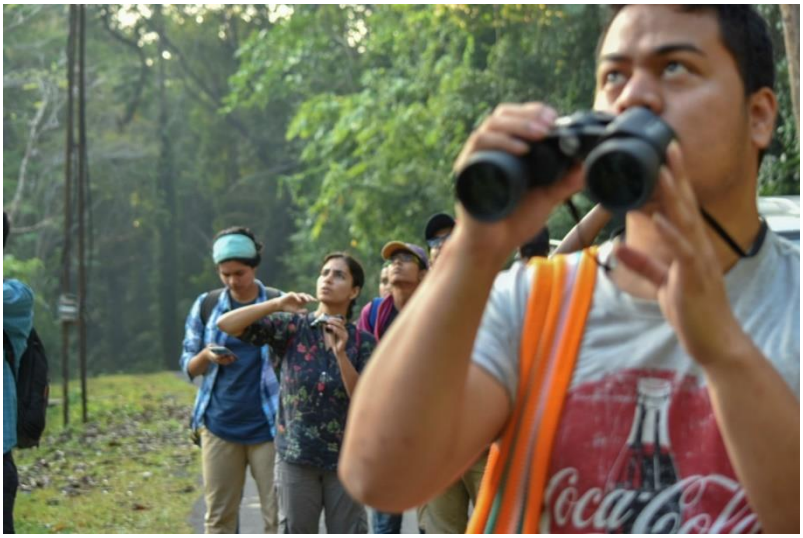


Students display their bamboo mats post a training workshop with the grand master Saw Watha (Agu). Programme: Redwood EduTours - JBCN Borivali, Mumbai. January 2018. ***Photo: Mahira Kakajiwala***

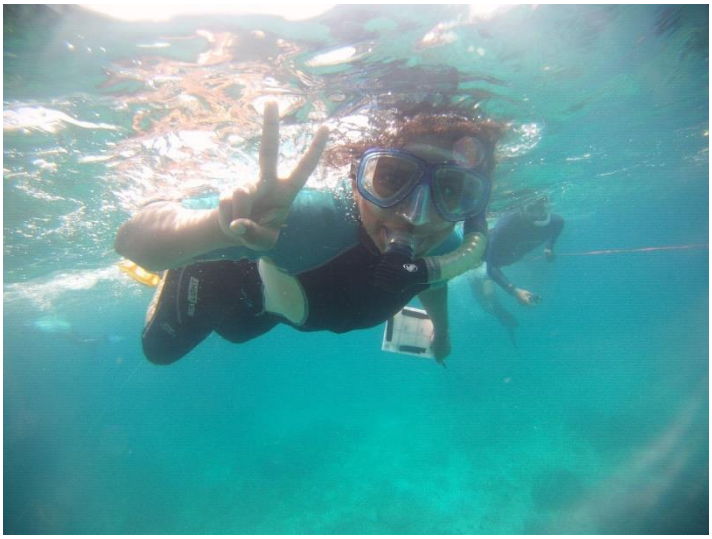
Visiting College Groups-Highlights

Davidson College – our first college group for the 2017 – 2018 season was particularly successful as these US students visiting ANET were already on a semester long study abroad programme in India and were accompanied by their Professor and a course Teaching Assistant. Davidson College runs annual programmes with Madras Christian College and thus ANET did not have to take on additional responsibilities regarding student visa and immigration.

In February and March 2018, ANET ran longer (2 week) island ecology and marine biology programmes, the first was for an exchange programme with the University of Technology Sydney and the second was a Department of Biotechnology sponsored workshop on tropical marine biology and ecology. The DBT sponsored programme in March has enabled 15 students from across India to delve into the physical and theoretical aspects of marine biology and conservation, the funding support and contribution of visiting faculty and ANET researchers have opened up opportunities to students previously unavailable in India.



Catching early birds in the Mt. Harriet National Park, South Andaman Island. Programme: Enduring Andamans - University of Technology Sydney, February 2018. Photo: UTS Studen.



Snorkelling the patch reefs at Playground, Allen's Patch, North Wandoor, South Andaman. Programme: Workshop on Tropical Marine Biology and Ecology – Department of Biotechnology. March 2018.
Photo: Mahima Jaini

ANET supported 20 principal investigators this year. Their projects ranged from the study of historical natural resource extractions in the islands to present day herbivory on coral reefs. A list of the projects and their associated researchers is provided below.

Name	Title	Personnel	Institution
Adhith Swaminathan	Monitoring of Leatherback sea turtles in the Andaman & Nicobar Islands	Dr. Kartik Shanker, Dr. Naveen Namboothri, Adhith Swaminathan, Muralidharan M.	Dakshin Foundation & IISc
Akshay Surendra	Patterns of plant biodiversity and carbon recovery in response to selective logging – a case study from the Andaman Islands, India	Akshay Surendra, Dr. Jayashree Ratnam, Vanjulavalli Karthick	NCBS
Ashwini Mohan	Genetic diversity of the infraorder Gekkota on the Andaman and Nicobar Islands: Identifying islands and species of conservation importance.	Ashwini Mohan, Dr. Kartik Shanker	IISc
Anupama Ramakrishnan	Ethnography of migrants in the Andaman Islands	Anupama Ramakrishnan & Dr. Sudha Vasan	Delhi University
Dayani Chakravarthy	Long-term monitoring of forest tree communities, biomass and dynamics in the Andaman Islands	Dr. Mahesh Sankaran, Dr. Jayashree Ratnam, Dayani Chakravarthy, Kartik Teegalapalli	NCBS
Elrika DSouza	Towards recovery of the dugong population in the Andaman and Nicobar archipelago	Dr. Elrika D'Souza, Dr. Rohan Arthur	NCF
Hemant Goyal	Underwater Citizen Science: Designing long-term stakeholder-based monitoring schemes for India's marine systems	Dr. Kartik Shanker, Dr. Naveen Namboothri, Hemant Goyal	Dakshin Foundation
Ishika Ramakrishna	Determining the nature and extent of interactions between the people of Great Nicobar and the Nicobar long-tailed macaque	Ishika Ramakrishna, Dr. Anindya Sinha, Dr. Ajith Kumar	NCBS
Madhuri Mondal	A study on how different socio-ecological interactions affect Coral Reefs of Mahatma Gandhi Marine National Park	Madhuri Mondol, Dr. Johny Stephen	TISS
Madhuri Ramesh	Thinking with Trochus	Dr. Madhuri Ramesh, Dr. Naveen Namboothri, Dr. Meera Oommen	Dakshin Foundation
Manish Chandi	Renewing livelihood resources of *Nypa fruiticans, Pandanus leram* and technological interventions in the Southern Nicobar Islands	Dr. Manish Chandi	MCBT

Nitya Prakash Mohanty	The invasive Indian bullfrog *Hoplobatrachus tigerinus* on the Andaman Islands: Evaluating drivers of distribution, density, and the trophic impact of an early stage invader.	Nitya Mohanty, Dr. John Measey, Dr. Kartik Vasudevan	Stellenbosch University & Centre for Cellular and Molecular Biology
Sachin Vaishampayan	A social perspective of cetacean-fisheries interactions in the Andaman Islands	Sachin Vaishampayan	MCBT
Sadaf Sethwala	Islands of Wisdom: A collaborative education partnership between ANET-Dakshin and WATIS in the Andaman and Nicobar Islands	Mahira Kakajiwala, Sadaf Sethwala, Dr. Naveen Namboothri	Dakshin Foundation
Sahir Advani	Exploring fish commoditization and the values of fishing communities in the Andaman and Nicobar Islands, India	Sahir Advani, Dr. Tony Pitcher, Dr. Mimi Lam, Dr. Naveen Namboothri	University of British Columbia & Dakshin Foundation
Sameer R. Ghodke	Abundance, ecology and conservation status of two species of homalopsines from mangrove habitats in the Andaman & Nicobar Islands	Sameer Ghodke	Independent
Shiba Desor	Assisting locally beneficial initiatives among the Karen community in the Andaman islands	Shiba Desor, Saw John, Manish Chandi, Dr. Naveen Namoothri	Dakshin Foundation
Tanmay Wagh	Assessing the role of herbivore fishes in maintaining the coral-algal balance on coral reefs in the Andaman Islands, India.	Tanmay Wagh, Dr. Vardhan Patankar	NCBS
Dr Vardhan Patankar	Assessing reef resilience in the Andaman Islands	Dr. Vardhan Patankar, Tanmay Wagh, Zoya Tyabji, Nairika Bharucha	NCBS & CWS
Zoya Tyabji	Diversity of elasmobranchs caught in the Andaman Islands	Zoya Tyabji, Tanmay Wagh , Anushka Rege, Dr Vardhan Patankar, Nairika Bharucha .	MCBT

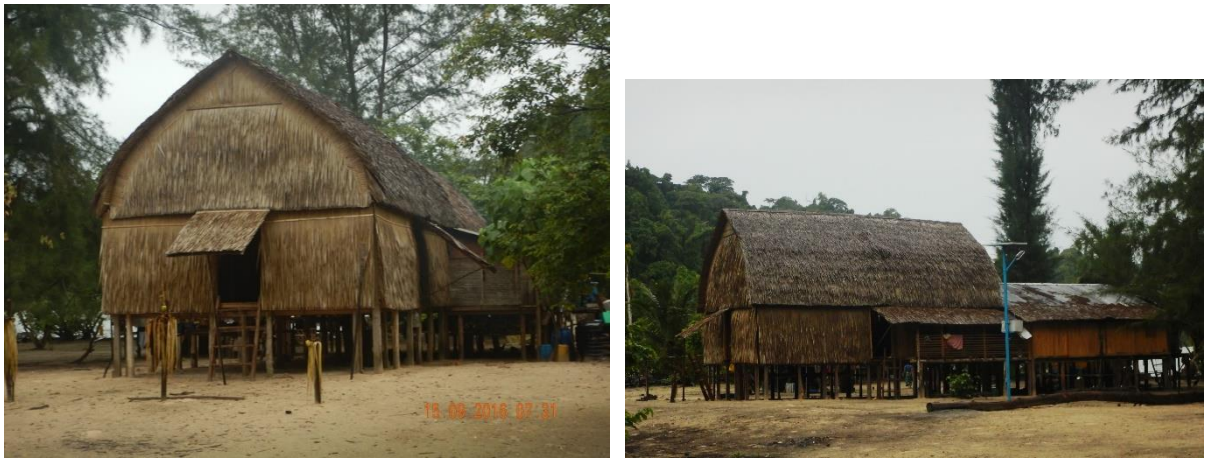
Some project summaries from the Andamans and Nicobars:

Manish Chandi- Renewing livelihood resources of *Nypa fruiticans*, *Pandanus leram* and technological interventions in the Southern Nicobar Islands.

This is Year 3 of this project. Its broad objectives of this project are, to regenerate two native flora species that are used by the islanders of Great & Little Nicobar Islands. The species are *Nypa fruiticans* and *Pandanus* leram. The former tree is a mangrove palm and its leaves are used to thatch traditional houses; the latter species is a traditional source of nutrition that Nicobar islanders used as a staple until half a century ago. It is processed more recently as a source of nutrition for the elderly and young children and supplements diets of others in the absence of market derived alternatives.

Overall the regeneration of floral species has been very successful and has reinvigorated a return to traditional housing and appreciation of traditional sources of nutrition- both of which were set back for a while due to many acculturations experienced as part of the 2004 tsunami reconstruction efforts. The project has come to an end and final reporting and utilisation of funds is to be submitted soon.

Little Nicobar: processing pandanus paste, and a thatch roof made with Nypa fruiticans at Pulo Panja village

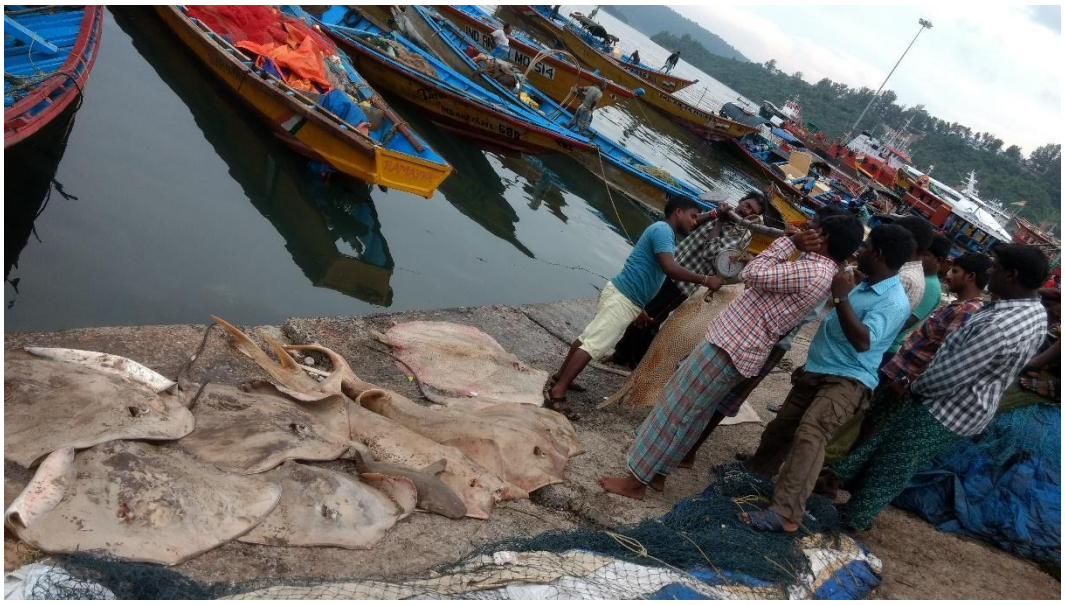


Ceremonial long houses- Afra Bay, Great Nicobar

Regenerating Nypa groves at Pulo Ulon village-Little Nicobar
Photos: Manish Chandi

Zoya Tyabji – The ongoing project aims to assess the current conservation status of elasmobranchs in the Andaman and Nicobar Islands. India. Since January 2017 to the present, 3500+ elasmobranch individuals have been sampled from fish landing sites of South Andaman in order to establish species-specific information on seasonal diversity, maturity, life history and length-weight relationships. Information has been gathered from fishermen on fishing grounds, habitat and gear vulnerability. Additionally, the team has formed a network of key

informants which include fishermen, processing unit owners, divers, and sport fisher owners who help us in generating and documenting elasmobranch information. As India is the second largest shark harvester of the world with targeted shark fishing still occurring in the archipelago, the results will form the basis for future work aiding in efficient management measures.



Elasmobranchs of the Andaman Islands as sampled in fishing landing sites. *Photo - Zoya Tyabji*

Vardhan Patankar – is Assessing reef resilience in the Andaman Islands. Climate change is considered the greatest long-term threat to the coral reefs. Managers must, therefore, focus on supporting the natural resilience of reefs. Factors contributing to resilience are multidimensional and contingent on local conditions. Identifying these factors at managerially-relevant scales is important if resilience principles have to be included in rational reef conservation efforts. Reefs of the Andaman and Nicobar Islands are the most diverse in India and considered a biodiversity hotspot. A multiple series of catastrophic disturbances (including repeated mass bleaching and a tsunami) have impacted these reefs, seriously testing their buffer capacity. In the face of these disturbances, it is important to understand what factors makes certain reef resilient, and incorporate these in the prevailing reef management of the Andaman Islands.

Coral reef resilience: an Acropora coral recruit. Photo: Vardhan Patankar

Tanmay Wagh – is studying the reefs of the Islands, which have been impacted by a series of natural disturbances the most recent being the mass coral bleaching of 2016. Post bleaching events, dead reefs can get colonized by fast growing algal communities which can out-compete the coral larvae for settlement and in turn affect the process of reef recovery.

The objective is to understand the process of herbivory in the islands and the role of herbivores in controlling the alagal growth in terms of biomass and succession. This study fits into larger a project dealing with the assessment of coral reef resilience across the archipelago led by Dr. Vardhan Patankar. Initially the team surveyed sites within and outside the MGMNP. At each site we assessed the herbivore fish community (using underwater belt transects) , benthic cover (by taking photo quadrats) and the bite rates of herbivores (by using underwater cameras to calculate the number of bites taken by each species on algae) as part of the initial stage of the work. The second phase which is currently ongoing, involves setting up herbivore exclosures at four selected sites to see the growth and succession of algal communities in the absence of herbivory.

Herbivorous species of surgeon fish and parrot fish near North Wandoor, South Andaman Photo: Tanmay Wagh

Shiba Desor – is focusing skill diversification and conservation of biocultural diversity among the Karen community residing in the Mayabundar region of Middle Andaman island. A major part of the project is capacity building for the Andaman Karen Crafts (AKC) Cooperative Society which was formed in 2014 with the objective of supporting local livelihoods and conservation based on biocultural heritage. Activities include :

- *Revitalising ties to land*: A community nursery of plants of local value like bamboo, cane and medicinal plants; workshops on environmental awareness and conservation; building local skills and resources.

- *Building and maintaining relevant skills and traditional practices*: promtion of basket weaving, cloth-weaving; manufacture of miniature dungis through AKC; community markets for home-grown and wild produce. .
- *Gathering baseline data on socio-economic profile*: A household level survey ; documenting stories and reflections, socio-cultural changes. Visit https://www.facebook.com/Andaman-Karen-Crafts-2232742603418209/.

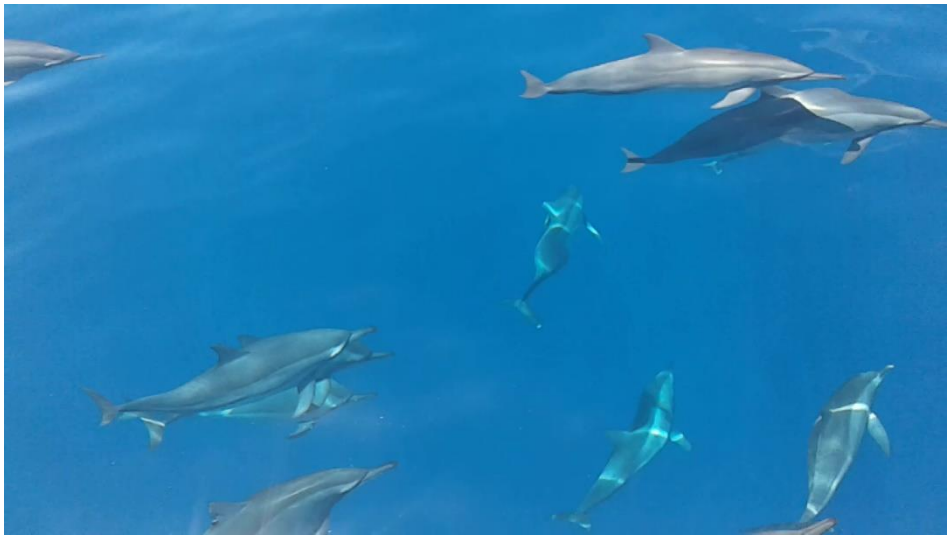
Sameer Ghodke – taxonomy of the snakes of the Andaman and Nicobar Islands. Visit andamannicobarsnakes.com, which contains published/unpublished information on snakes

of the Andaman and Nicobar islands. Currently focused especially on the abundance, ecology and conservation status of two species of homalopsines from mangrove habitats of the Islands. The study species include *Cantoria violacea* (Yellow-banded mangrove snake) and *Gerarda prevostiana* (Glossy marsh snake) and this is revealing interesting information regarding their natural history, dietary preferences, distribution and population threats.

Sahir Advani – is continuing his doctoral research on the values of fishing communities in the Andaman and Nicobar Islands. The communities included in his study are Nicobari, Karen, Bengali and Telugu. Through semi-structured interviews, value prioritization exercises, and expert-driven roundtable discussions, his research intends to provide policy implications for culturally- and locally-contextualised and inclusive fisheries management.

Sadaf Sethwala – has, through support from the Wipro Applying Thought in Schools (WATIS) initiative, launched a foundational learning programme for local students around ANET. With support from the local panchayat, there is an after-school programme for Classes 3-5, which sees about 15 students per class. Additionally, with support from the Government Middle School, Wandoor up a library is being set up for primary school students. Both set-ups have been developed to focus on language, comprehension and expression skills of students in their native language, while introducing and strengthening English language skills.

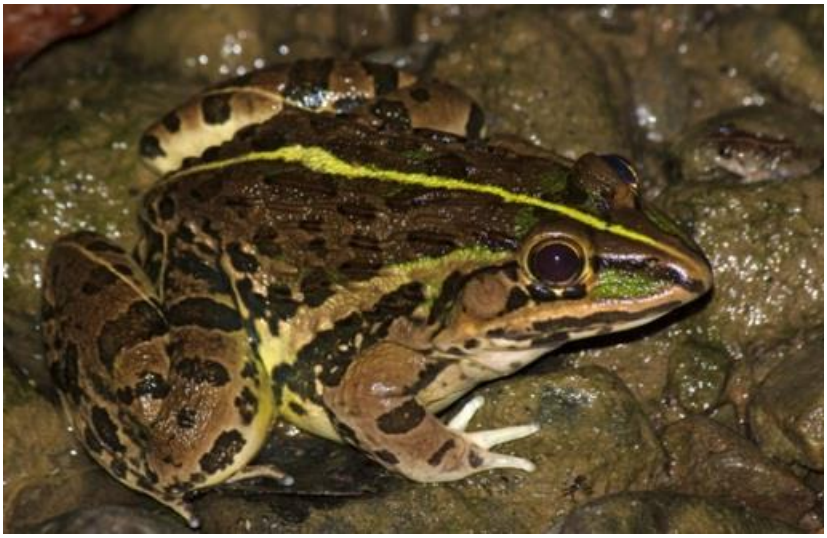
Sachin Vaishampayan – is studying the relationship between cetaceans and fisheries include resource sharing and conflict situations and the fishermens' perceptions of the 9 species present. Information is being gathered on cetacean distribution and seasonality of sightings, use of dolphin presence as indicators of underlying fish stocks, effects of cetaceans on the fish catch, instances of depredation and damage to gear, accidental entanglements and mortality, and general beliefs about marine mammals.



Stenella longirostris from a video shared by fishermen at the Junglighat Landing Centre

Photo: Sachin Vaishampayan

Nitya Mohanty – is assessing the extent and drivers of the Indian bullfrog's recent invasion of the Andaman Islands. The study focusses on the influence of humans on the spread of the bullfrog, its impact on native vertebrates, and effective management scenarios for its eradication.The Indian bullfrog, *Hoplobatrachustigerinus*, naturally occurs in the Indian sub-continent and its large body size, generalist diet, breeding vigour, and synanthropic nature confer it with an ability to outcompete and prey heavily on native anurans and other vertebrates. Given that the Andaman Islands are a global biodiversity hotspot, several endemic species could potentially be safeguarded through management action based on the findings. In tandem with a growing national concern on invasive species in India, the findings of the study would contribute to formulating a general strategy for preventing invasions into island ecosystems of the country.

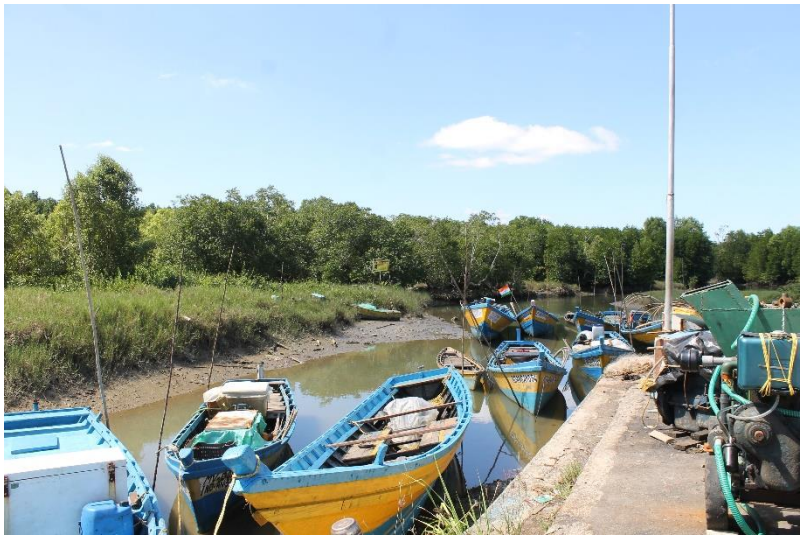


The Indian bullfrog and a native frog of the Andaman Islands. Photo: Harikrishnan S

Madhuri Ramesh – is looking at the ecological and social factors that label products – food, ornaments, wildlife, etc- and guide how we perceive them. As a result, messy power struggles can result and are an inherent part of how we relate to the natural world i.e. politics is an inherent part of ecology. This project is tracing the shifting status of the Trochus snail (also known as the Top shell or *Tecturus niloticus*) in the Andaman Islands to (a) identify how changing categorizations privilege certain factors and their concerns at the expense of others and (b) the consequences for snails and island communities. Overall this project will contribute to an improved understanding of how ecology and economy articulate with each other in the marine space.

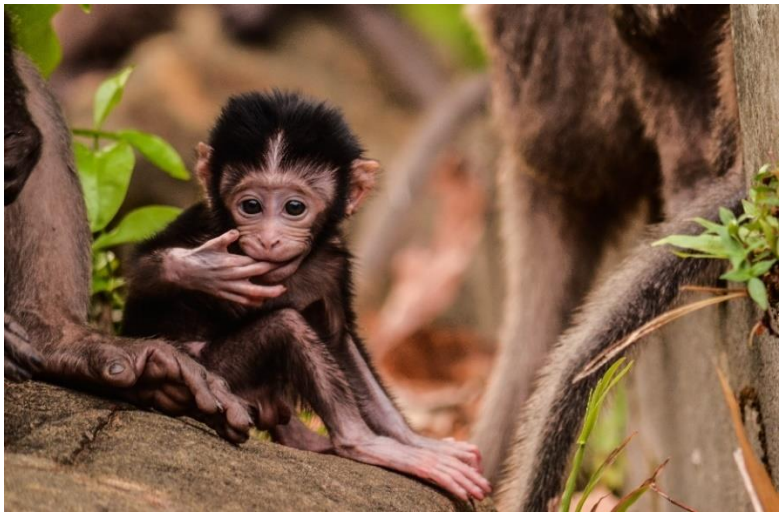
Madhuri Mondol – aims to document and understand the park-community interaction in and around the Mahatma Gandhi Marine National Park and assess the level of resource use and dependence in and around MGMNP and to determine the perceptions of local communities towards the park. The success of a Marine National Park depends on the cooperation of the local community. Knowing the perception of people is important to understand their attitudes towards any conservation policy or actions. Their perception towards a national park is influenced by many factors

including their dependence on the park resources, their socio-economic status and how the park has influenced their livelihoods.



Fishing dungis at Guptapara jetty. *Photo: Madhuri Mondol*

Ishika Ramakrishna – is studying the endemic sub-species *Macaca fascicularis umbrosa* found on Great Nicobar Island which is increasingly becoming a 'weed macaque' like its Southeast-Asian sister species. The locals on this island interact with the Nicobar long-tailed macaque on a daily basis as their areas of residence overlap significantly. Following the tsunami of 2004, this zone of overlap has increased further and the macaques now make use of human-provisioned food like coconuts and areca nut from plantations, and fruits and vegetables from peoples' gardens to supplement their diets. Social surveys are being conducted across the island, collecting citizen science data from the locals and collecting behavioural data on two macaque troops through direct observations. An amalgamation of these data will be used to describe the current situation on the island of Great Nicobar and suggest potential mitigation measures to contain or reduce negative interactions.



Juvenile Macaque, Great Nicobar Island. *Photo: Ishika Ramakrishna*

Elrika D Souza – is nearing the end of the project titled 'Towards Recovery of the Dugong population in the Andaman and Nicobar archipelago'. Material was prepared (posters, signage etc) which will increase awareness about dugongs amongst fishermen, tour-boat operators, tourists and local communities. Posters been designed in English and Hindi. The team is in the process of receiving feedback for improvement, before introducing it to stakeholders.

Dayani Chakravarthy – is part of the ANET-NCBS team which has established long-term forest monitoring plots on Alexandria and Rutland Islands which are part of the South Andamans Archipelago. This is part of the Long-term Ecosystem Monitoring Network (LEMoN India), a country- wide collaborative effort by NCBS. It has established and monitors tree communities, biomass and dynamics in a network of 1 ha forest plots across different forest types of India, and across environmental gradients in order to understand factors regulating long-term forest dynamics and potential responses of these systems to future climate change.

LEMoN Project South Andaman Island. Photo: Venkatesh L.

Ashwini Mohan -has an ongoing project which is assessing the origin, evolution, and diversity of geckos on the Andaman and Nicobar Islands. In this phylogeographic study, gekkonid lizards across 23 islands in both Andaman and Nicobar archipelago have been sampled. Tissue samples are being analysed and results indicate a total of 18 gecko lineages, with potentially six hitherto un-described species. Geckos of the Andamans show Indo-Chinese affinities and those from Nicobar show Indo-Malayan affinities. Among other interesting directions, the study supports, for the first time, the role of historical connectivity on divergence and dispersal patterns among gekkonids in the archipelago. An endemic gecko of the genus *Phelsuma* (Andaman emerald gecko, *Phelsuma andamanensis*) is being investigated further for fine-scale patterns of population dynamics and evolutionary relationships with other species of *Phelsuma* geckos, as part of my her doctoral study.

Anupama Ramakrishanan – studying the ways in which resource politics in the Andaman Islands is expressed through identity assertions by migrant groups. Groups that have a longer history of settlement in the islands claim their right over the islands' resources and accuse later, more recent migrants of unsustainable exploitation of social and natural resources. These political struggles over resource access have only intensified in the context of the neoliberal turn of the state and economy. Through an ethnographic exploration of the resource and identity politics of one such group—descendants of Bengali-speaking, agrarian, refugee settlers in North Andaman, also known as 'Bharti Family'— the ways in which people in the Andaman Islands make cultural and practical sense of their land, natural resources and environment are being investigated.

Akshay Surrendra – is examining the impact of the recent shift in forest management objectives by comparing functional and taxonomic biodiversity, timber value and carbon stocks in twice-logged forests (recent logging under the new regime) against corresponding once-logged forests worked in two decadal durations in the past - 70-80 years ago and 25-35 years ago. Forest recovery is disaggregated by forest type, and edaphic determinants of forest type difference will be examined. The study is being conducted in Baratang and Middle Andaman forest divisions between Nov 2017 and May 2018. Rainforests support high biodiversity and provide direct and indirect ecosystem services. Direct benefits (chiefly timber through selective logging) has been the focus of forest management in the Andaman Islands, India for over 150 years. Only in the last decade has the focus shifted to sustainability.

Adhith Swaminathan – continues to head ANET's leatherback monitoring programme in Little Andaman, now in its 11th year. The two index beaches, South and West Bay, were monitored from 27th December, 2017 to 27th February 2018. During the two months, 63 nests were recorded in West Bay and 7 in South Bay. Our monitoring efforts have been focused in West Bay since 2010 and 5 new nesting females were tagged and one previously tagged turtle from 2014 was encountered. Several capacity building workshops were conducted in South, Middle and North Andaman for the forest department staff to build on the capacities of the field personnel working with sea turtle projects in the region. This will help standardise the protocols for data collection and improve existing conservation programs across the Islands.

A female leatherback turtle nesting in West Bay, Little Andaman. Photo: Adhith Swaminathan

MCBT ACCOUNTS 2017-2018

Donors

Donor name	Name of the project/organisation	Amount (Rs)
Charities Aid Foundation, India	Enriching the Crocodile Bank education program	20,46,129.00
Ocean Park Conservation Fund Hong Kong	Reptile Conservation in Rural Tamilnadu	6,87,372.00
Cholamandalam Investment and Finance Company Limited	For implementation of Phase -2 Chola-Madras Crocodile Bank- protection and conservation of endangered reptiles project	35,00,000.00
Prague Zoo	Gharial Telemetry	9,60,354.00
Give2Asia	Snake Rescue and Snakebite Awareness	9,67,606.00
Give2Asia	General Donation and maintenance	48,499.00
St Augustine Alligator Farm Inc	King Cobra Ecology Conservation	95,735.00
Reptile gardens	King Cobra Ecology Conservation	97,103.00
Wildlife Conservation Society	King Cobra Ecology Conservation	63,760.00
Gemein Schaft Der Fuerderer	King Cobra Ecology Conservation	75.550.00
Stichting Herpetofauna	King Cobra Ecology Conservation	1,51,255.00
Rufford Foundation	VHF technology to monitor movements of an apex predator, the marsh crocodile	3,19,194.00
Nanak Properties pvt ltd	Consultancy fee for setting up a croc farm	1,00,000.00
Eddy J Even	Gharial Telemetry	65,300.00
Muzamil	Snake Rescue Project	50,000.00
John Roger Daniel	Adopt an Animal - Jaws III	40,000.00
Sreeram Ramachandran	Adopt an Animal – Green Anaconda	30,000.00
Saravanan Udayar	Adopt an Animal – Alligator	45,000.00
Pramod Balaji	Adopt an Animal – Indian Rock Python	30,000.00
Kumar Raj	Adopt an Animal – Nile Crocodile	25,000.00
Dr Sundar Rajan	Adopt an Animal – Morelet's Crocodile	30,000.00
USV Private Limited	Snakebite Mitigation	30,00,000.00
National Centre for Biological Sciences	Andaman and Nicobar Environmental Team	12,00,000.00
Danamojo Online Solutions Private limited	Specific projects and general expenses	1,35,520.00

In-Kind Donations

Name	Item
Ashwath & group	Bike - ARRS
Matt Good	Research Equipment - ARRS
Senthil	2 binoculars and GPS - ARRS
Shrunga Prabhudeva	Phone -Micromax Canvas 1 - ARRS
Pratap KS & family	Phone -Redmi 5A - ARRS
Praveen KS & family	Power bank - Philips Power banks 11000mAH - ARRS
Dushyanth Jadeja	Phone - Lava Pixel v1 - ARRS
Deepak Balasubramani	Phone - Redmi Note 3 - ARRS

INCOME AND EXPENDITURE STATEMENT 2017-2018

INCOME

Sl.no	Particulars	INR
1	Ticket Sales	1,95,82,820.00
2	Research Grants	1,23,34,896.64
3	Donations & Rent	8,90,883.67
4	Environment Education	11,90,109.00
5	Adopt an Animal	4,46,750.00
6	Bank Interest	3,55,203.00
7	Croc Shop sales	12,24,705.00
8	ARRS	15,21,493.59
9	ANET	20,72,331.00
	TOTAL	**3,96,19,191.90**

EXPENDITURE

1	Salary and Wages	96,84,176.00
2	Reptile Feed Costs	41,80,974.00
3	Maintenance and Upkeep	32,75,040.00
4	Pen Maintenance and Upkeep	19,93,514.00
5	Research	1,87,61,256.64
6	Environmental Education Expenses	1,32,870.00
7	ANET	16,35,113.55
8	ARRS	25,84,746.24
9	Croc Shop Expenses	6,31,345.00
10	Administrative Expenses	3,81,754.76
	TOTAL	**4,32,60,790.19**

Visitation to Madras Crocodile Bank 2017-2018

Month	Total no of visitors
April'17	35,551
May'17	52,216
June'17	29,776
July'17	29,726
August'17	34,668
September'17	35,240
October'17	38,391
November'17	18,543
December'17	52,163
January'18	50,949
February'18	30,057
March'18	32,943
Total	**4,40,223**

AFFILIATED INSTITUTIONS

(*Committees/ Membership/ Collaboration/ Consultation/ Editorial/ Networking*) The World Conservation Union (IUCN)
IUCN/SSC Crocodile Specialist Group
IUCN/SSC Tortoise and Freshwater Turtles Specialist Group IUCN/SSC Marine Turtle Specialist Group
IUCN/SSC Indian Subcontinent Reptile & Amphibian Group IUCN/SSC Captive Breeding Specialist Group
IUCN/SSC Sustainable Use of Wild Species Group
National Centre for Biological Sciences, Bangalore
Centre for Cellular and Molecular Biology, Hyderabad World Congress of Herpetology
World Wide Fund for Nature (WWF) - India & International Wildlife Institute of India, Dehradun
Bombay Natural History Society, Mumbai
Centre for Environment Education, Ahmedabad Chicago Herpetological Society, USA
Fauna and Flora International, UK
Development Alternatives, New Delhi Chennai Snake Park Trust
Irula Tribal Women's Welfare Society, Chennai
Irula Snake Catchers' Cooperative Society,

Chennai International Association of Zoo
Educators, UK Jersey Wildlife Preservation Trust,
UK
Turtle Survival Alliance
Niligiri Wildlife Association,
Ootacamand Central Zoo Authority of
India, New Delhi
Salim Ali Centre for Ornithology & Natural History,
Coimbatore
Madras Veterinary College, Chennai
Madurai Kamaraj University,
Madurai Pondicherry University,
Pondicherry
Andaman & Nicobar Islands State Wildlife Board, Port Blair
Andaman & Nicobar Islands State Level Environmental Council, Port Blair.
Andaman & Nicobar Islands 'Monitoring Committee for the Working Plan for the South Andaman Division'.
Andaman & Nicobar Coastal Zone Management
Authority. Andaman's Science Association, Port Blair
Society for the Andaman & Nicobar Ecology, Port
Blair Auroville Index Seminum, Tamil Nadu
Ashoka Innovators for the Public, New
Delhi Kalpavriksh, Pune
Coral Reef Monitoring Network- South East Asia, Sri Lanka
Dakshin Foundation, Bangalore Karnataka
Survival International, UK
Trust for Environmental Education (TREE), Chennai
Zoo Outreach Organisation, Coimbatore
The Indian people's Tribunal on Environment & Human Rights, Mumbai
The Wildlife Trust of India, New Delhi
Smithsonian Institution, USA
Marine Conservation Society, U K.
UNEP/Conservation for Migratory Species of Wild Animals, Germany

People Involved with Indian Snakebite Initiative

1. Dr. David Williams (Global Snakebite Initiative/University of Melbourne)
2. Dr.Kartik Sunagar (IISc)
3. Gerard Martin (TGMP)
4. Dr. Jaideep Menon (AIMS, Kochi)
5. Dr. Joseph K Joseph (Little Flower Hospital, Angamaly)
6. Dr. Anand Zachariah (CMC,Vellore)
7. Dr.Harshjeet Singh Bal (CMC,Vellore)
8. Jose Louies (WTI/Indiansnakes.org)
9. Shaleen Attre (WTI/Indiansnakes.org)
10. Kedar Bhide (Natureworks)
11. Priyanka Kadam (she-india.org)
12. Soham Mukherjee (Naja.in)
13. Sumanth Madhav (HSI-India)

14. Jayasimha NG (HSI-India)
15. Ganesh Mehendale (OWLS)

TN – Education Partners

1. ATREE-ACCC
2. Kenneth Anderson Nature Society (KANS)
3. CEE- Tamilnadu
4. Santhi animal welfare and wildlife conservation trust (SAWWCT)
5. WWF-Western Ghats landscape program
6. CMC Vellore
7. Keystone Foundation
8. Wild Wings Trust