Madras Crocodile Bank Trust/
Centre for Herpetology

Annual Report 2020-2021

The year of the pandemic…

CROCTOWN IN LOCKDOWN!!

INTRODUCTION

We entered the financial year 2020-21 with uncertainty. The zoo was closed to the public on March 16th, 2020, resulting in a total loss of revenue from ticket sales, which supports the zoo's maintenance. We did not know when the zoo would be allowed to have visitors again, and even once visitors were allowed, the numbers were going to be restricted. Our other major source of revenue –CSR– would also be affected significantly because companies' profits would be impacted by the prolonged lockdown. As many of our donors are foreign zoos, facing similar situations due to the pandemic, it was unlikely that they would be able to continue supporting us. With zero income from ticket sales, decreased income across all other streams, and the looming threat of COVID-19, we were bracing ourselves to face the impact.

Since COVID-19 is here to stay for some time, the first thing we did was to enhance our precautionary and preventive measures and this has become an integral part of our workplace practice. Under the guidelines issued by the Central Zoo Authority, only essential personnel were asked to report to work. Their temperatures were screened daily and only those within the normal range were allowed to work for the day. In addition, all the staff have been provided with PPE including masks, disposable gloves and aprons. All areas of the park that were being used routinely, such as the offices, feed store and laboratories, were disinfected daily, and hand sanitizers were provided at strategic points (entrances, exits, individual rooms/buildings). With all these proactive steps, we ensured that none of our staff were infected with COVID-19, and at the same time took good care of our animals.

Once the health concerns were addressed, we focused on the financial part of the pandemic problem. Everyone got into action; trustees, staff, and well-wishers, reaching out to donors for help during this very difficult period. We organised two fundraising campaigns that received overwhelming support from our patrons. We also focused on improving our social media presence which resulted in generating revenues from newer sources. For example, our YouTube channel started to generate a monthly income in ad-revenues. Further, our paid online programs were a super hit. The pandemic had opened up our zoo not just to those who could visit us in Chennai, but also to people across the globe. Media outlets also publicised ways in which well-wishers could reach out and help us.

The zoo was finally opened to the public on Nov 10th, 2020, almost 8 months after we closed and we emerged from the lockdown much stronger. Online posts and appeals, engagement with the print and tv media, and reaching out to previous donors have been productive, and indicated yet again that the Croc Bank has a strong network of friends and supporters here and abroad. A very grateful thanks to everyone who helped, financially or otherwise.

This kind of support- from friends, family, and conservation-minded well-wishers, has existed from the beginning, when MCBT was started in 1976 by a group of idealistic conservationists including Rom Whitaker and Zai Whitaker, 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 44 years of reptile 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 the Croc Bank, a reptile zoo on the East Coast Road south of Chennai, and field stations and study sites reaching as far afield as the Chambal River. 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”. In keeping with our original goal, over 1500 crocodiles were sent to various states for restocking in wild habitats. However, the release of captive bred mugger or marsh crocodiles into the wild, is no longer happening, 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, i.e. 23. Of these, 16 are housed at the Croc Bank currently, the only place in the world where such a sizable chunk of the total species can be seen. Of the species 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, i.e. 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 fact, 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 the field station it started in the Andaman Islands, ANET (Andaman and Nicobar Environment Team), which is now being very ably run by Dakshin Foundation.

In 1976, it was obvious 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 one of the few environmental research bases in the archipelago and voices ecological concerns on many local committees which advise the 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.

For the last few years, Dakshin Foundation has partnered with the Croc Bank in the administration and development of ANET and this has been most productive and will have long-lasting benefits for the conservation and research platforms in the Islands. In 2019, the roles were reversed, and Dakshin agreed to take over the field station's administration completely, with MCBT playing an advisory and supporting role. The evolution and history of ANET is a good example of how much can be done when organisations come together to work for the common cause; in this case, Dakshin Foundation and Madras Crocodile Bank Trust.

Another such field station is ARRS, the Agumbe Rainforest Research Station. Situated in Agumbe in the Western Ghats, it was set up by Rom Whitaker in 2005, its focus being the biology and conservation of the king cobra. Agumbe is one of the world's last refuges of the "king". Other iconic herpetofauna in this biodiversity hotspot include Draco (flying lizard), pit vipers and several species of endangered amphibians. A black panther has been seen a couple of times, on one of the pathways that adjoin the ARRS campus. Research projects range from frogs to pit vipers, and of course the king cobra. The 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, because it deals with one of the most threatened (and potentially dangerous) species of snake in the world.

2000 kms to the north of MCBT 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 rare and critically endangered 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 again, the Croc Bank conducted programs on snakebite and its treatment at schools, colleges, NGOs, government departments and tourist groups. Education is 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 important husbandry experience and expertise for species in those regions (eg the Siamese crocodile).

We could not do what we do, without the help we receive from innumerable well-wishers. This includes donations, field and program participation, partnerships, and other “in kind” support. The names of this community of Croc Bank friends is extensive and we are extremely grateful to all of them.

ADMINISTRATIVE DETAILS - MCBT

Trustees:

Ashish Gupta

Samit Sawhny

Prof Satyajit Mayor, Director, NCBS (resigned in October 2020)

M.M. Venkatachalam

Kamini Sundaram

Venu Srinivasan

Meera Anna Oommen (joined in January 2021)

Ex Officio Trustees:

Rom (Romulus) Whitaker (Founder)

Zai (Zahida) Whitaker (Founder)

PERSONNEL- APRIL 2020 TO MARCH 2021

Office and Administration

Managing Trustee	Zai Whitaker
Director	Allwin Jesudasan
Curator	Nikhil Whitaker
Assistant Curator/Snakebite Coordinator	Ajay Kartik (Until July 2020)
Assistant Curator	Ambika Yelahanka (From September 2020)
Zoo Manager	T Senthil
Education Officer	Steffi John
Veterinarian	Dr. Ruchika Lakshmanan
Conservation Officer	Ganesh Muthiah (From December 2020)
Asst Coordinator, Snakebite Mitigation	Gnaneshwar Ch
ARRS- Field Director	Ajay V Giri
ARRS- Research Associate	Yatindra Kalki
ARRS- Base Manager	S S Jayakumar
Gharial Ecology Project- PI	Dr J.W. Lang
Gharial Ecology Project -Coordinator	Jailabdeen A

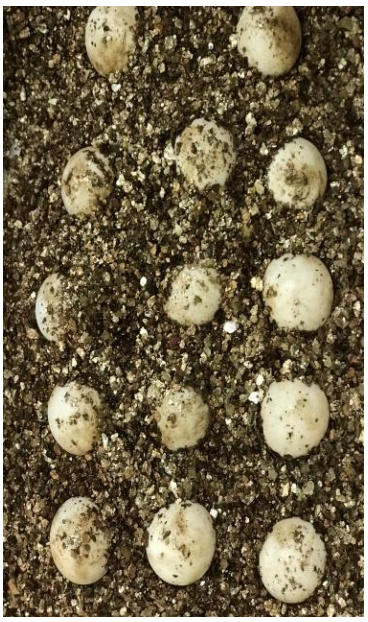
Accounts, Husbandry and Maintenance

M. Mohan	Accountant
M. Pavithra	Assistant Accountant
V. Gangadurai	Chief Reptile Keeper
S. Nagarathinam	Chief Reptile Keeper
R. Thangaraj (Retired on 14th June 2020)	Supervisor, Entrance and pen watchers
C. Dhanasekaran	Zoo Educator
L. Gunasekaran	Maintenance Supervisor
V. Mohanasundaram	Curatorial Assistant
T. Mohan	Office Assistant
C. Purushothuman	Senior Office Assistant
N. Selvamani	Ticket checker
R. Gnanamurthy	Ticket checker
M. Indradevi	Senior Housekeeper
E. Amutha	Enclosure Maintenance and Housekeeping
J. Shanthi	Chelonian Keeper
S. Parimala	Enclosure Maintenance
M. Ramu	Driver
S. Janakiraman	Animal Keeper
N. Pushparani	Croc Shop Operator
G. Ashok Somai Magar	Chief Cook
S. Mohan	Cleaning and Maintenance Asst
G. Gowri Shankar	Animal Keeper
Tek Bahadur Somai Magar	Security Guard
Budibal Somai Magar	Security Guard
Krishna Bahadur Somai Magar	Security Guard
V. Yuvarani	Enclosure Maintenance
A. Kumari	Maintenance and Cook
K. Elumalai	Maintenance Assistant

CURATORIAL AND VETERINARY TEAM REPORT

Conservation Breeding:

Banding in Batagur baska eggs



Aldabra eggs

The remnant Aldabra female laid two clutches of eggs on 24/01/21 & 22/02/21. Based on correspondence with zoos in Europe breeding this species, all eggs appear to be infertile.

A clutch of river terrapin and 4 of red-crowned roof turtles were collected in this period. A single clutch of gharial eggs from pen 24 (temple turtle pond) was laid.

The female blue tongued skink laid unfertilized eggs for the first time. Analysis of exudate from skinks showed live sperm under our light microscope, therefore confirmed the sex of the smaller individual to be male (potential breeding pair). Subsequently our female gave birth to 7 healthy babies on 16/02/21.

Blue tongued skink baby

A three-striped roof turtle (*Batagur dhongoka*) nest was laid on Christmas eve, with a total of thirteen fertile eggs. However, there was no hatching. The green anacondas gave birth on 08/10/2020 to 10 individuals.

Veterinary Care

Pre-treatment

Post-treatment

The reticulated python female was treated for rostral abrasions and stomatitis. The animal was carefully restrained and the wound was cleaned along with application of Silverex ointment (topical application). The reptile was treated further with three doses of intramuscular injection Ceftiofur (antibiotic) and is doing well and feeding.

A small amount of blood was collected from one male Aldabra tortoise. The DNA was isolated and a complete DNA sequence of it was obtained. We have received the data and are in the process of compiling it into a research paper.

The female juvenile green iguana suffered from partial paralysis due to a fall. This was treated using infrared therapy and massaging. The animal has since recovered completely. This data is being compiled into an article for veterinary research.

All lizards were dewormed in September 2020. All tortoises and snakes were administered deworming in the month of December.

Transfers within and out of MCBT

8 yellow anacondas were transferred to Arignar Anna Zoological Park, Chennai as part of an exchange program on 06/10/2020.

African slender-snouted crocodiles were shifted to their new enclosure on 02/11/2020.

The Cuban crocodiles were moved to an on-display enclosure on 04/11/2020.

The Sub-adult *Batagur baska* were weighed, measured, and shifted to a larger enclosure

Curatorial team measuring 2020 hatchlings

Development

Purchase of an endoscope, x-ray, and other vet lab essentials is going forward. The radiography machine arrived in March, 2021 and is being used to monitor egg laying and embryo development in Travancore tortoises. The endoscope has arrived and is awaiting installation.

X-ray image of Travancore tortoise with eggs

Timers have been set up to automatically turn off/on UV lamps for the green anaconda hatchlings and adult Whitaker's boas.

The new on-display enclosure for the big 4 snakes of India is currently under development and is set to be open to the public soon.

New basking areas were constructed for snakes and lizards. This has been useful during winter months to provide access to sunlight.

The on-display rock pythons were shifted to their newly constructed off-display enclosures.

In preparation for cyclone Nivar, trees were pruned and at-risk animals were shifted to indoor enclosures for safety.

Possible reintroduction programs:

Communication is ongoing with the U.P. Forest Department for the transfer of ~ 10 roof turtles (*Batagur kachuga*).

A proposal has been put forth to the Odisha Forest Department, for reintroduction of ~ 15 large juvenile river terrapins (*Batagur baska*).

Publications

Whitaker, N. & M. Srinivasan. 2020. Human crocodile conflict on the Cauvery river delta region, Tamil Nadu, south India. International Journal of Fisheries and Aquatic Studies 8(5): 01-05

Vaidheeswaran, G., G.Muthiah, & N. Tsai. 2020. Effects of anthropogenic noise on crocodilians. Newsletter of the IUCN/SSC Crocodile Specialist Group. 39 (2): 11 - 12.

CONSERVATION

Sea Turtle Conservation Project

Another successful year in the conservation of sea turtles and protection of nests. Records were maintained, of both in-situ and hatchery-based nests, from January 2021 to date along the coast from Kovalam to Nemeli Kuppam Village. MCBT, in association with the Sea Turtle Protection Force (STPF) members of Tree Foundation, and trained youth from the local fishing community, patrolled the beaches throughout the nesting season from January to April. All state health guidelines were followed. Checking poaching, mapping nest locations, recording distance from high tide line, time of nesting, relocating inundated nests, recording environmental parameters, maintaining nest temperature and releasing hatchlings were some of the routines followed.

Olive Ridley nest

Upon sighting nesting turtles, biometric data was recorded in a standardized log book and reported as per existing protocol on a daily basis to the Field Coordinator. Additionally, data regarding nests, nest location, nest relocation - details of number of eggs/hatchlings and the name of hatchery is notified to the District Forest Officer, Conservator of Forest and Project Investigator, of the Tamil Nadu Forest Department. All conservation sites and hatcheries are supervised by them. Thirty-nine Olive Ridley nests were found and more than 2,963 hatchlings were safely released/guided to the sea till date through this activity. An empowerment meeting for STPF members was conducted at the beginning of the season and monthly review meetings were conducted to share their experience and upgrade their knowledge.

Rescued and rehabilitated turtle

Nests laid near the estuary or other potentially vulnerable locations were relocated to avoid possible inundation and predation. Nests near human habitation were protected in-situ. Due to the COVID-19 situation, the Secretary of Environment and Forests for the state of Tamil Nadu is yet to announce a date for the release of the rescued and rehabilitated turtles.

Noise mitigation project

The noise mitigation project at MCBT has picked up pace this year. MCBT has been exposed to impermissible levels of noise on a regular basis, beyond the 'Ambient Air Quality Standards' with respect to noise under the Noise Pollution (Regulation and Control) Act, 2010. As we know, MCBT houses four critically endangered species (*Gavialis gangeticus*, *Crocodylus rhombifer, Batagur kachuga* and *Batagur baska*) and is committed to conserving these animals through captive breeding in a conducive environment. MCBT decided to study the impact of the noise pollution and mitigate it appropriately.

Recording noise levels

On 05.11.2019, an MoU was signed between a neighbouring resort, MCBT and the esteemed Indian Institute of Science, Madras (IITM) to mitigate noise. IITM recorded the noise levels on various occasions and published a report on 'Anthropogenic Noise Levels in Madras Crocodile Bank due to Events at Resorts'. In this report, several measurements made in MCBT during noisy events as well as on days without events hosted within the resort have been documented. It is clear from the data that there is a significant increase in the noise levels in the 50-160 Hz bands and measures have to be taken to reduce these levels by about 20 dB. The next report is expected to be released soon and it will provide details on how to achieve noise reduction. This information could be used as a baseline for policy makers who can work to include zoos and conservation centres in areas of restricted noise pollution.

MCBT is also engaged with the local communities around the zoo, to spread awareness on noise pollution and they are surprisingly very cooperative. About one-third of Vadanemmeli village population have signed a commitment pledge to mitigate noise by avoiding the use of firecrackers during functions and festivals. We hope that other beach resorts will also come forward for similar engagements with MCBT to mitigate noise levels, so that both the zoo as well as they can continue to function comfortably.

ZOO MAINTENANCE AND DEVELOPMENT

Staff Management:

- The safety of employees was ensured during the pandemic.
- Only permanent staff were employed during this period.
- Pen-watchers were briefed daily on COVID-19 safety measures to be followed while interacting with visitors.
- Security measures were improved for better administration of the zoo.
- Employees' problems were addressed on a regular basis.

Zoo Security Camera Maintenance:

More CCTV cameras were installed in areas that were not covered in order to monitor the workers and visitor's activities.

Development work:

Croc Shop and Croc Cafés

Our gift shop was revamped and opened in a new location near the exit gate.

Two Croc Cafes were installed, one inside the zoo and the other near the entrance,
The zoo manager's office was moved and revamped.

Compound wall with barbed wire was constructed on the South and East side.

Hydroponics and organic farming activities were initiated.

Mural work was completed in the following pens: Cuban crocodile (1A), African slender snouted crocodile (1B) and Alley, the alligator (1C). Damaged pens and walls were fixed.

Cuban crocodile enclosure with mural work

New EB room and transformer

Reptile themed carved stone benches

EDUCATION

Education programs

Zoo education programs took a major shift towards virtually engaging participants during the pandemic. The programs were a combination of guided tours around the park, a show & tell with animals, enclosure visits, and venom extraction from the "Big Four" venomous snakes of India. We conducted Snake Walks with a manageable number of people following safety precautions.

List of education programs conducted:

Programs	Date	No. of participants
Virtual Reptile Encounter	Aug 23rd 2020	80+
Snakebite Awareness for Juniors	Sep 12th 2020	25
Snakebite Awareness	Sep 19th 2020	16
Behind the Enclosures	Sep 20th 2020	17
Virtual Reptile Encounter & Stories	Oct 1st 2020	22
Virtual Reptile Encounter & Stories	Oct 5th 2020	35
Reptile Genius Event	Oct 18th 2020	50+
Children's Day Special	Nov 14th 2020	62
A Virtual Date	Dec 6th 2020	21
Our Zoo Vet	Dec 20th 2020	14
Snake Walk	Dec 27th 2020	16
Reyaan's Vrtual Reptile Party	Dec 30th 2020	16
Snake Walk	Jan 10th 2021	15
Virtual Encounter (Navkis)	Jan 21st 2021	10
Snake Walk	Feb 7th 2021	14
Can You Guess The Species	Feb 18th 2021	22
Snake Walk (Abacus School)	Feb 28th 2021	17
Snake Walk (Abacus School)	March 7th 2021	18

Program poster

World days: World days were celebrated virtually on social media. We conducted quiz programs, shared pictures and had good social interactions with our followers.

- World Snake Day – July 16th 2020
- World Lizard Day – Aug 14th 2020
- Snakebite Day – Sep 19th 2020

Social media: The following content was prepared for Social Media:

Educational videos
Adoption posts
Program posters
Online quiz
WhatsApp group for the program participants
Going live during park talks

Snake talk with park visitors

Park talks: Since November 10th 2020, when the park reopened, feeding talks and snake talks happened regularly every Sunday. During feeding demos, our Education Officer interacted with the visitors, thereby ensuring that they were kept engaged. This also helped visitors to connect with the staff and know more about our park.

The following timings were followed:

- Snake talk with python - 11 am
- Snake talk with baby green anaconda - 3:30 pm
- Crocodile demo feeding - 11:30 am, 12:30 pm, 04:00 pm and 5:00 pm
- Green iguana feeding - 12:00 pm

Night safari: Night Safari was conducted from Tuesday to Sunday, from November 2020 to March 2021. During this period, 670 individuals (adults and children) participated in the night tour to have a one-of-a-kind experience. The feedback from our participants was positive, and a few participants retook the night safari and brought along a different group of friends. Due to the pandemic, we reduced the number of participants each night to 20.

Adoption board

Adoption program:
We received immense support from our well-wishers during this lockdown. Most of our enclosures were adopted.

From April 2020 to March 2021, we received 162 Individual adoptions and 14 Enclosures.

Volunteer program:
Due to the pandemic, we temporarily paused our volunteering opportunities at MCBT.

Conference & Webinars:

1. Future of Zoos and Aquariums - 75th WAZA annual conference with IZE San Diego 2020. 11th to October 14th 2020, Virtual presentation.
   Topic: Scale & Smile: Stories on Reptile Education in India.
2. IZE - COVID-19 - Stories of Hope for Education – August 20th.
3. Webinar with Sci-Chronicle representing Madras Crocodile Bank Trust on "Mysterious or Misunderstood: The role of education in reptile conservation" - October 17th had over 80 participants.
4. Virtually celebrated International Day of Zoo & Aquarium Educators on 12th of November with IZE members from all around the globe. MCBT was featured as one of the faces of IZE in their social media platform.
5. Webinar lecture with The Children's Garden School Society representing Madras Crocodile Bank Trust on "Introduction to Reptiles" - Feb 6th had over 80 participants.
6. Our Education Officer was an IZE 2020 sponsored delegate. She will be invited to attend the IZE/EAZA virtual conference in 2021. This will take place in October 2021.

IN THE FIELD

The King Cobra Ecology & Conservation Project (KCEC)

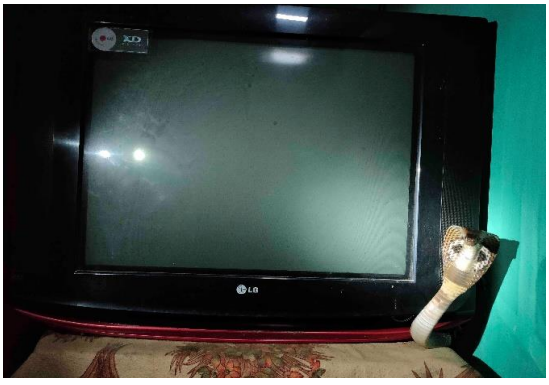
There were restrictions for transportation and other logistics due to the coronavirus pandemic. Permissions were acquired from the authorities in the initial stages to continue tracking King cobras without interruption and attend rescues calls. In July 2020, the KCECP report was submitted to the Forest Department officials of Megaravalli, Thirthahalli, Shimoga, Koppa and Karkala divisions.

King cobra feeding on Malabar pit viper

Male king cobras in combat

Human-Snake Conflict Mitigation Project (HSCMP)

During this period, we received a total of 291 distress calls from the Forest Department and the local community. We rescued 166 King cobras, observed 7 individual King cobras without any disturbance and observed 5 King cobra pairs during their breeding season, rescued 83 Spectacled cobras, 17 pythons and 4 were observed, 2 Trinket snake, 2 Rat snake, 1 Krait, 1 Malabar Pit Viper, 1 Cat snake and 1 Whitaker's sand boa. Every rescue call was an opportunity to create onsite awareness among local communities and we also distributed educational material to them.



Education outreach work

On the occasion of “World Wildlife Week 2020” Karkala & Kudremukh forest divisions organised a cyclothon to create awareness on wildlife and nature conservation. ARRS Education Officer participated in the program, interacted with participants & forest department officials, explained about ARRS work and distributed informative material.

Awareness program with RFO recruits

28/11/2021, ARRS conducted an awareness program for the VFC community of Hebri village.

17/02/2021, ARRS conducted a program for 70 RFO recruits from Telangana state forest department.

19th to 21st March 2021, In collaboration with Mr Jose (Indiansnakes.org), ARRS conducted a workshop in Agumbe for 8 participants.

On 22/09/2020, ARRS received three TVS bikes as a donation for the KCEC project

SNAKEBITE MITIGATION & SNAKE CONSERVATION PROJECT

The Centre for Herpetology/Madras Crocodile Bank's (CFH/MCBT) Snakebite Mitigation and Snake Conservation project has been successful over the past three years. The generous support from USV Pvt Ltd, Infosys Foundation, Oracle, Google, Battle of Buffet, Hamish Ogston Foundation, TVS Motors and Srinivasan Services Trust has enabled us in mitigating this multilayered issue, and some of our key milestones are as follows:

Outreach and capacity building

We partnered with various NGOs and herpetologists to conduct extensive education, outreach and capacity building programs across 7 of the snakebite-prone states of India - Andhra Pradesh, Bihar, Jharkhand, Madhya Pradesh, Maharashtra, Odisha and Tamil Nadu.

This year, a number of outreach programs were put on hold due to Covid-19 and consequent lockdowns. The team conducted 13 programs through virtual platforms. Simultaneously, outreach programs were conducted in three other states, namely, Madhya Pradesh (35 programs), Andhra Pradesh (18 programs) and West Bengal (6 programs). Two training sessions for the staff of Forest and Fire Departments were also conducted.

List of current educational partners

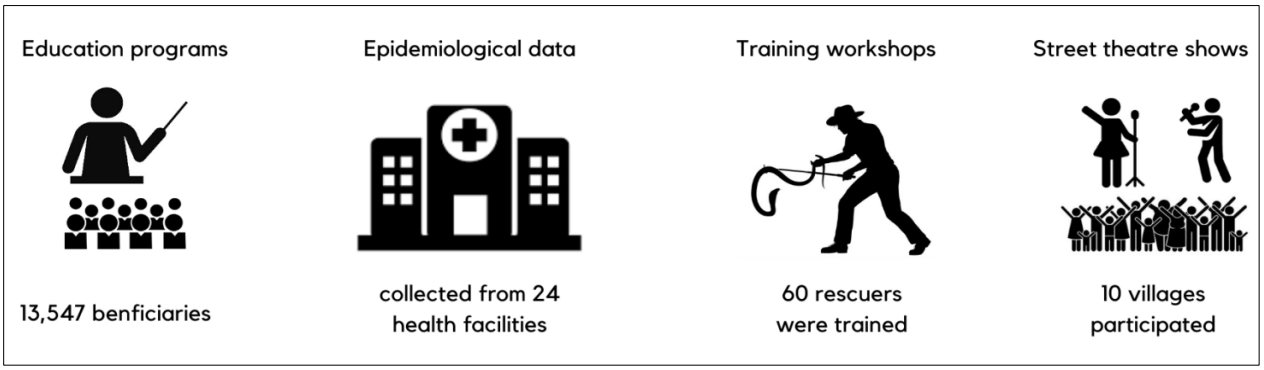
S No	State	Partner
1.	Andhra Pradesh	Eastern Ghats Wildlife Society
2.	Andhra Pradesh	Wildlife Conservation through Research & Education
3.	Karnataka	Haavu Mattu Avu
4.	Madhya Pradesh	Animal Rescue and Protection Force
5.	West Bengal	Society for Nature Conservation, Research and Community Engagement
6.	Bihar & Jharkhand	Wild Bihar

These programs covered school students, farmers, health workers, Forest Department, etc. Over 16,00,000 people have attended our workshops so far. We created simple and concise educational material, including posters, handouts and short films in multiple regional languages to be shared with our participants. In addition, we conducted snakebite awareness talks at MCBT, at 11:00 am and 03:30 pm on Sundays.

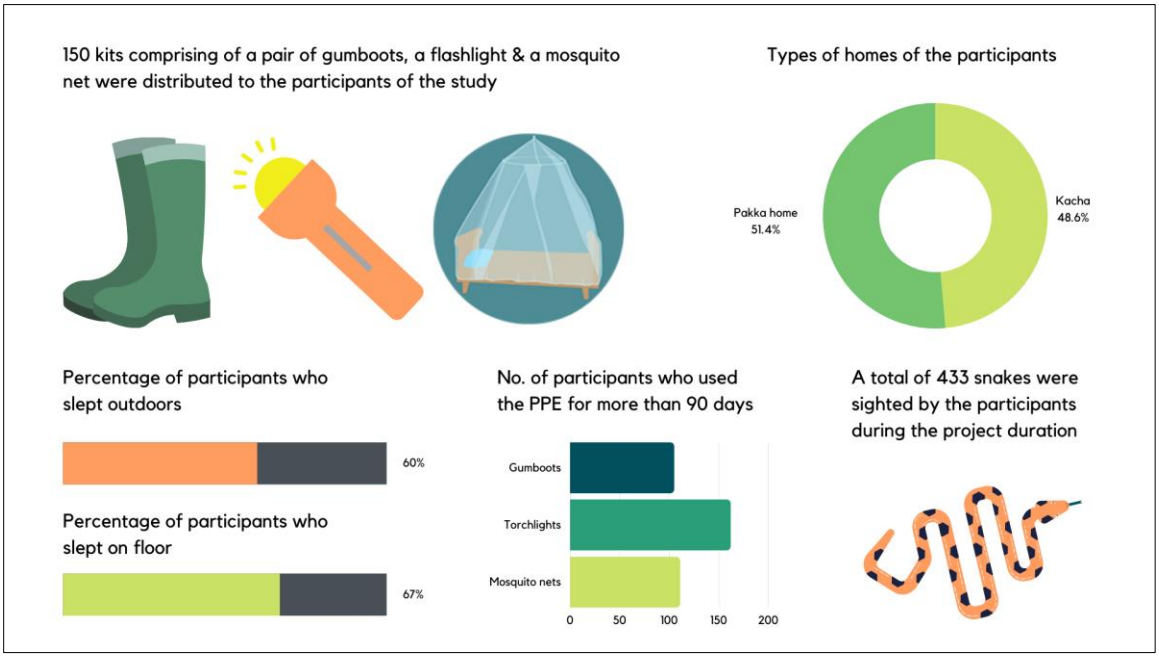
As a part of the Battle of Buffet grant, we conducted a series of educational programs at government schools of Kanchipuram district. This project is extended until May 2020. The

snakebite mitigation project at Thirukarrankudi, in collaboration with Srinivasan Services Trust, was resumed in September 2020. The acceptability of protective equipment i.e. rechargeable torch lights, gumboots and mosquito nets was assessed through a series of surveys and testimonial recording. The team also conducted surveys to assess the knowledge about snakes between participants who attended the outreach programs and those who did not. Some important achievements and findings of the project are as follows.

Results of the project



Results of the acceptability study



Venom collection & research

Through this component, we are studying if snake venoms differ regionally in the same species of snakes. We are also testing the efficacy of antivenom against the venom of different snakes from across India. This data will be extremely useful in the measures being taken to improve the quality and modernize the production of the existing antivenom. We visited Rajasthan and Andamans for venom collection and the samples collected have been transferred to Dr. Kartik Sunagar's Evolutionary Venomics laboratory, Indian Institute of Science, Bangalore where analysis of samples is underway. Three manuscripts have been published and a few more scientific publications are in preparation. Below are the links to the manuscripts.

1. Biogeographic venom variation in Russell's viper (Daboia russelii) and the preclinical inefficacy of antivenom therapy in snakebite hotspots
   https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0009247

2. Biogeographical venom variation in the Indian spectacled cobra (Naja naja) underscores the pressing need for pan-India efficacious snakebite therapy
   https://journals.plos.org/plosntds/article?id=10.1371%2Fjournal.pntd.0009150&fbclid=IwAR0k2TkRjkPgxGZ_L-f5t8bu0pRzOAIxlIeLhWe3gckiO5dYPvfJwTLAYX8

3. A Wolf in Another Wolf's Clothing: Post-Genomic Regulation Dictates Venom Profiles of Medically-Important Cryptic Kraits in India
   https://www.mdpi.com/2072-6651/13/1/69?fbclid=IwAR0td_O4einuz9tOXc_S3Qgs91-vR3Jy8PyGxp-sgspGxb7QPAk1GOeGBeQ

Technological Interventions

Through our tie-up with Jose Louies at the Tropical Institute of Ecological Sciences (TIES), Kottayam & Indiansnakes.org, we aimed to map the temporal and spatial occurrence of the common venomous snakes of India, as well as create a real-time updated database of clinics and hospitals across the country that routinely handle snakebite cases.

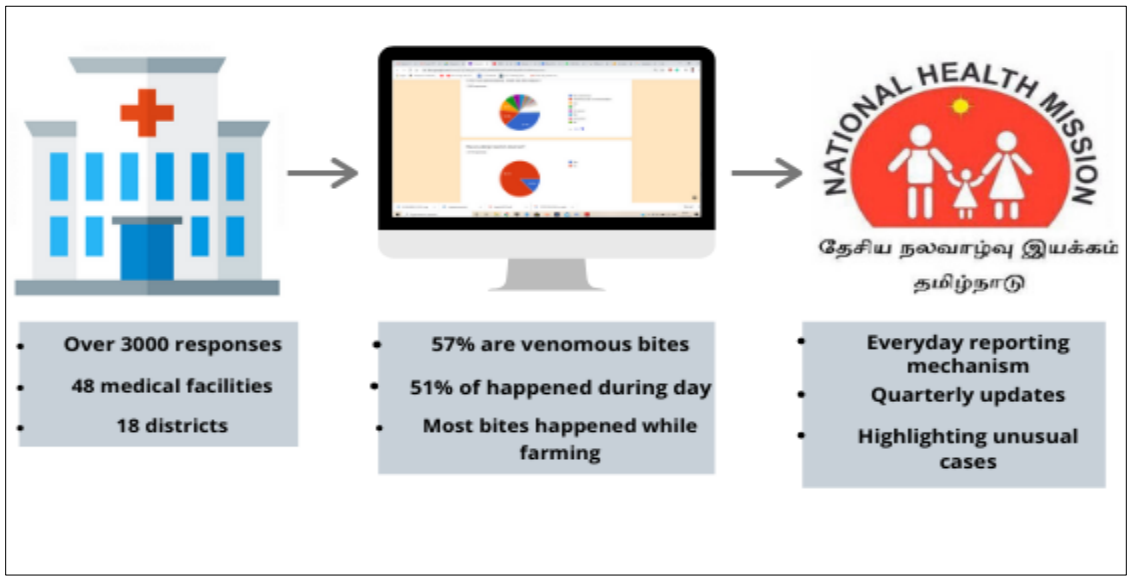
Through our collaboration with Indiansnakes.org, we have developed 'SERPENT', a mobile app for multiple purposes like contacting a snake rescuer, identifying snakes, locating hospitals nearby and watching our educational films. This unique app, a first of its kind in India, was released in December and has about 10000 users so far. It has also shown an increase in numbers of snake rescues. An online guide to Indian snakes and contacts of snakebite experts are the key specialties of this app.

Interfacing with Government

We partnered with the National Health Mission, Tamil Nadu State towards collection of epidemiological data and established a snakebite registry for the state, a project that we hope will be replicated nation-wide. The snakebite registry has now over 4000 entries from various government medical facilities across Tamil Nadu. The multiple parameters of information sourced the registry is further used towards data-driven mitigation measures. Also, we are training the doctors in identification of snakes and understanding their ecology.

We are assisting the Commissionerate of Industries and Commerce to improve the infrastructure of the Irula Snake Catchers' Industrial Cooperative Society such that it abides by standard operating guidelines issued by the World Health Organisation. This will contribute to manufacturing of better effective antivenom and facilitate extensive research.
We are working closely with the Indian Council for Medical Research to prepare a White Paper that illustrates the burden of snakebite and necessary measures to be taken against it, to be submitted to the Office of the Prime Minister. The White Paper has been accepted by the Indian Journal for Medical Research and is expected to be published in July 2021.

Results of snakebite registry



Conferences & workshops attended

1. Allwin Jesudasan presented at the Wildlife Week Celebrations orgsnised by the Andhra Pradesh Forest Department.
2. Ajay Kartik & Gnaneswar Ch presented at a workshop organized by the Andhra Pradesh Forest Department on the occasion of National Snake Day.
3. Gnaneswar Ch presented at the Annual Snakebite Conference organized by the Amrita Institute of Medical Sciences
4. Gnaneswar Ch presented at the National Snakebite Strategy Meeting organized by Medecins Sans Frontieres(MSF)/Doctors Without Borders

5. Gnaneswar Ch presented at a National Level Conference on Human Animal Conflict organized by the Centre for Wilderness, Manipal Hospitals
6. Gnaneswar Ch presented at a workshop organized by the Maharaja Sayajirao University of Baroda
7. Gnaneswar Ch presented at a workshop organized by the Redpath Museum of McGill University, Canada

Going forward:

We are in the process of evaluating our activities and measuring their impact which we will publish as peer reviewed papers with a focus on epidemiology and socio-economic constructs surrounding snakebite. We are aiming to expand into more districts and states while partnering with more NGOs. The team visited Madhya Pradesh, Mizoram, Manipur, Assam & West Bengal to find more partners to collaborate with. It is also working with a filmmaking company, Kucing, in making a film to address the problem of snakebite in North Eastern India. We are in constant touch with the Tamil Nadu government in conducting more education & capacity building programs and collecting data systematically for the upcoming academic year. We have made strong progress in interfacing with the government and through our recent efforts, the Prime Minister Office is likely to broadcast “Mann Ki Baat” on the burden of snakebite.

Online workshop for students

GHARIAL ECOLOGY PROJECT

The Gharial Ecology Project (GEP) is now in its 14th field season, since its initiation in 2008 following the mass die-off of Gharial (Gavialis gangeticus) in the winter of 2007-2008. Our research, supported by the international zoo community and private donations, is sanctioned under the NGO umbrella of the Madras Crocodile Bank Trust (MCBT). The GEP programs are facilitated by the State Forest Departments of Uttar Pradesh, Madhya Pradesh and Rajasthan, as well as the Ministry of Environment, Forest and Climate Change, Government of India. The GEP is the present-day avatar of the Gharial Conservation Alliance, and our media presence has increased through an active Facebook page, YouTube Channel, and soon to be inaugurated new website, now under construction.

Covid constraints: With the onset of pandemic restrictions in early 2020 on international travel, Prof. Lang, GEP's Senior Scientific Advisor, had to cancel his seasonal visits to the Chambal. He stayed in touch with the field team via frequent phone and internet contacts. The GEP field crew, consisting of Jailabdeen A, Pankaj K., Anand K. and "Guddhu" K., plus Ashutosh T., have observed in-country lockdowns and precautions, worn masks, practiced social distancing, riding individually on motorbikes, and related precautions. Despite travel limitations, surveys have been possible for total population counts in the winter months, and for post-hatching nest/hatchling counts at crèche sites before the annual monsoon in mid-summer. The outreach programs for capacity building, teacher-training and community development have been largely curtailed, but outside gatherings have allowed us to conduct a limited number of such programs, despite the pandemic conditions. As of April 2021, international travel has not resumed for most visitors to India, and we continue to plan and coordinate the GEP field activities remotely.

Ghara on male Gharial

Comprehensive surveys: In 2020, the entire Gharial population within the NCS (bottom ~425 km, from Pali to Pachnada) was surveyed and estimated at ~1700 individuals. In the upper Chambal, there are an estimated 400+ Gharial, specifically 35 males, 285 females, 25 sub-adults, 48 juveniles and 23 yearlings. In the lower Chambal, 1274 Gharial were directly observed and tallied by static survey. These consisted of 66 males, 415 females, 428 sub-adults, 261 juveniles and 104 yearlings. Adjusted for accuracy in size categories, these counts included 80 mature males plus 59 "near-mature" males, 525 reproductive and "near-reproductive" females, 435 sub-adults, 295 juveniles and 151 yearlings.

In January-March 2021, various surveys were conducted to make additional actual counts of Gharial in NCS, in the manner similar to those conducted in previous years. In the upper Chambal, there are an estimated ~380 Gharial, specifically 29 males, 210 females, 102 sub-adults, 26 juveniles and 21 yearlings. In the lower Chambal, ~1320 Gharial were directly observed and tallied by the static survey. These consisted of 73 males, 461 females, 399 sub-adults, 248 juveniles and 140 yearlings. Adjusted for accuracy in size categories, these counts included 71 mature males (with ghara) plus 31 “near- mature” males, 671 reproductive and “near reproductive” females, 501 sub-adults, 274 juveniles and 161 yearlings.

We counted 250 nests at 17 sites in the lower stretch of the Chambal, and 180 of these hatched at 16 sites. Overall, there were 401 nests counted in 2020, of which 297 hatched and 105 were lost. Nesting in the NCS likely exceeds 90% of the global total annually. Today, the NCS population is the only remaining population residing in an open riverine, largely protected habitat. Importantly, it is self- sustaining, definitely stable, and appears in recent years to be on the increase. However, major threats loom large, including uncontrolled water extraction, rampant riverside sand mining, and ubiquitous illegal net fishing.

Field team studying drone imagery

Drones deployed: We have been using DJI quadcopter drones to create 2D and 3D maps of riverine habitats, using geo-referenced JPEGs. Drone imagery facilitates species identification (Mugger versus Gharial), quantification of numbers present, as well as more accurate estimates of animal sizes. With regard to locating and counting nests, aerial methodology is reliable when colony size is mid-range - >5 but <20 nests.

Gharial communication: Jailabdeen A has continued his PhD research on acoustic signaling amongst “big ghara” males. These signals consist of underwater “pops” in stereotypic patterns, primarily with “timing” variations, which are individually distinctive as well as context-dependent. Jai is also investigating chemical signaling via secretions produced in the gular and cloacal glands. Samples from wild Gharial of various sizes, ages, and sexes have yielded complex mixtures of distinctive chemical compounds. Such secretions are presumably responsible for the noticeably strong, musky smell produced by large male Gharials during breeding.

Upstream base, downstream office: Our new upstream base at Katrinapur, a small riverside village, is located within a 15-minute walk to the Baroli sandbank on the Chambal River. It took shape in late-2019 as a stand-alone office-workroom with adjoining bath-toilet facilities, and was completed by late 2020. Downstream, we have established an Indian NGO called “Gharial Local and Global,” with a local Etawah office that serves as headquarters for our outreach programs.

Tagging and tracking: In late 2020, our field tracking team joined forces with a trusted cadre of local fishermen to capture and tag Gharials with radio transmitters for tracking. In both years, we have conducted capture

operations in both downstream and upstream stretches of NCS, separated by about 250 km. In November-December 2019, we caught 27 Gharial, and radio-tagged 14, including one with an Iridium (satellite) tag (Fig. 4), and the rest with VHF transmitters in the downstream. In the upstream, in early December 2019, we tagged 10 large Gharial, including a 4.8 m “big ghara” male, and outfitted that animal and another female with satellite tags as well.

GEP field team attaching an Iridium Wildlink transmitter

In November-December 2020, the field team caught and tagged 13 additional Gharial downstream and 13 upstream, including 8 Gharial with satellite tags. One of these was in the downstream, a female, and the remainder in the upstream, including 6 females and another “big ghara” male of 5.3 m TL

Altogether, as of end of March 2021, we are monitoring a total of 9 Iridium tagged Gharial, outfitted with GPS loggers. These units communicate daily location “fixes” of each animal several times a week via satellite link to the internet. A “kml” file is produced for each individual which can be visualized as map locations in Google Earth. To date, noteworthy new findings, using this methodology, have included:

1. Documentation of behavioral interactions among the multiple males’ resident at or near the upstream breeding groups;

2. Discovery of multiple nests on an upstream tributary not previously known to be used by Chambal Gharial;
3. Tracking a downstream resident female up into the mid- stretches of the NCS, where she subsequently bred and will most likely nest nearby in 2021; and,
4. Recovery after 7 years, of a juvenile marked in 2013 with radio in the downstream. Now a sub-adult resident in the upstream, this female appears to have shifted its residency from downstream to upstream, over a total distance of 260 km. Such spatial findings are detailed on our Facebook page, as these seasonal movements occur.

Kuno connection: Discovery of the importance of Kuno National Park (KNP) as seasonal Gharial habitat, through its connections with NCS, has spurred a new-found interest by the Madhya Pradesh Forest Department (MPFD) in Gharial conservation and protection in this specially designated and protected area. KNP is now being used as an additional release site for “head-started" juvenile Gharial from the Deori Eco Centre rearing facility. We have been able to partner with the MPFD, and radio tag a small cohort of these animals being released in this upstream tributary, and in the mainstream Chambal nearby. In December 2020, we tagged 11 head-starts, 6 for release in KNP and 5 for release at the Baroli sandbank on the main Chambal. At the end of March 2021, all 11 of these juveniles are actively being tracked, with most remaining near their release sites. Also, none of the recently tagged Gharial from the mainstream Chambal have ventured into KNP for nesting this year. Water levels are markedly lower than in 2020, and trial nesting has not yet been observed along the Kuno River tributary this season.

Captive-raised Gharial is measured and radio-tagged

Hatchling survival: We outfitted 3-4-month-old young with backpack radios in the post-monsoon period (September-October) Survival of these young Gharial has been about 60% after 3 months, and appear to be lower than the 90% levels of survivorship we have documented for 9-12-month-

old Gharials. In contrast, the first 4-6 weeks for a hatchling appear to be particularly perilous, and our observations of crèche size indicate that at least half of the crèche disappears, presumably directly through predation, before the onset of monsoonal high water.

Head-started versus wild juveniles: We have been working in collaboration with the MPFD to track head-started 2-4-year-old juvenile Gharials, reared at the Deori EcoCentre facility near Morena in Madhya Pradesh. In comparisons of wild resident versus reared “head-starts”, matched for size/age, wild juveniles had higher rates of survival and showed well-defined and stable patterns of residence, with no residency shifts and/or long dispersals. In contrast, fewer “head-starts” survived,

and were more likely to shift residences and/or move long distances. Furthermore, released captive-reared Gharial were more likely to be predated by sub-adult and adult Muggers, and showed atypical behaviours during the first few months following release in the wild.

Films, videos, media: The GEP has an active Facebook page, with frequent posts about recent events and activities. Selected GEP posts are now available in Hindi, and are being translated into other regional languages (eg Tamil) as well. These are freely downloadable on the GEP YouTube channel. Animal Logic produced a 7-minute video called “Boop the snoot” including GEP behavioural footage - an edited version is on YouTube. A recent 3:30 min short on Chambal Gharial natural history appears on our Facebook and on the MCBT website, and is now available in English, Hindi, Nepali, Burmese, Sinhalese, Bengali, Malayalam, Tamil and Urdu, as well as Spanish, French, German, Czech, Norwegian, Dutch and Chinese. This video summarizes the major findings from GEP studies on the Chambal over the past decade and a half.

The GEP has been very fortunate to work closely with a talented Indian film maker, Kalyan Varma and associates, and currently is teaming up with these cinematographers to make a series of documentaries, focusing on resident Gharial in NCS.

On the Brink (Season 2) was filmed with our team in 2019, and features Pankaj Kumar, the main GEP field researcher and tracker. In this scene, Pankaj describes a newly constructed Gharial nest at a colonial nest site on the lower Chambal. Pankaj has worked with the GEP since its inception in March 2008.

Recent magazine articles that have featured stories about the GEP include a historical account of Gharial conservation at the MCBT by one of its founders, Zahida Whitaker (2020). In a three-part series in the Wall Street International travel magazine, Wijeyeratne (2020) highlighted findings of the telemetry tracking studies on Gharial, as well as Chambal River birds and related landscapes, and the challenges of conducting research in NCS.

Future prospects: Hopefully, as Covid restrictions are relaxed, international travel will resume between India and the rest of the world, and our regular seasonal exchanges will be possible. In the interim, the GEP field team, headed by Jailabdeen A and Pankaj K., will continue to conduct field studies in both the upstream and downstream stretches of NCS, and develop strong ties with our upstream partners such as Tiger Watch, based in Rajasthan.

Our focus in the near-term will be to document Gharial life history patterns of those residing in the upstream Chambal, for possible comparisons with our prior observations in the downstream Chambal, during the past decade.

We are extraordinarily fortunate to have the continued support of the City of Prague/Prague Zoo and the generous contributions of donors to CrocFest through the Gladys Porter Zoo. The Summer CrocFest (late June 2021) at Zoo Tampa promises to support the Gharial Ecology Project, and we gratefully acknowledge the invaluable support received to date, literally making Gharial conservation on the Chambal a reality.

Village children at a community program organized by the GEP examine an awareness poster as part of the outreach meeting held at the confluence of the Yamuna and Chambal Rivers.

NEWS CLIPS APRIL 2020 – MARCH 2021

Date	Title	Press
20.05.2020	India's oldest reptile park is fighting to keep crocs fed amid lockdown	India Today
01.06.2020	The Zai Whitaker column – Notes on camping with crocodiles, and watching baby muggers hatch	Firstpost
03.06.2020	Chennai's conservationists sustain their initiatives through the lockdown	The Hindu
05.06.2020	The Zai Whitaker column – On World Environment Day, looking back at lessons by the greatest teacher of all time	Firstpost
05.06.2020	Madras Crocodile Bank needs your help to tide over COVID-19	Citizen Matters
05.06.2020	Here's what The Madras Crocodile Bank Trust's 'zoo normal' will look like when it reopens for the public	Indian Express
15.06.2020	The Zai Whitaker Column – Trailing Ajay Giri (from a safe distance) while on a King Cobra rescue mission	Firstpost
15.07.2020	World Snake Day 2020: how to make space for snakes	The Hindu
13.08.2020	Well-wishers help Madras Crocodile Bank avoid a financial crisis during pandemic	Live Mint – Magazine
10.08.2020	With no visitors, lockdown hits Madras Crocodile Bank	The Hindu business line
13.08.2020	India crocodile park faces cash crunch amid coronavirus lockdown	Al Jazeera - Magazine
13.08.2020	Strapped for cash, India's largest croc park appeals for help	Pune Mirror – Magazine
13.08.2020	India's largest crocodile park strapped for cash after lockdown	The Indian Express
13.08.2020	Future uncertain for Madras Crocodile Park	The Telegraph - Magazine
17.08.2020	Everything to Know About Madras Crocodile Bank That Needs Help Amid The Pandemic	Scoop Whoop
27.08.2020	HCL sets up its first European Cyber security Fusion Center in Sweden	Business - Standard
28.08.2020	HCL offers aid to Chennai zoo, crocodile bank	The New Indian Express
15.09.2020	Visit to The Madras Crocodile Bank Trust and Centre for Herpetology	Vikatan (Tamil)
24.09.2020	How #lockdownblues has led to the rise of virtual animal adoption	Times of India

Date	Title	Press
19.10.2020	How India’s largest crocodile bank in Chennai is battling Covid - 19	The Indian Express
19.10.2020	The Zai Whitaker column/ Remembering Bob and Tanya, saviours of the Western Ghats’ sky islands	Firstpost
20.10.2020	A home makeover for reptiles at Madras Crocodile Bank	The Hindu
13.11.2020	Madras Crocodile Bank reopens after lockdown	The Hindu
23.11.2020	The Zai Whitaker column/ A (second) lockdown dispatch from the Madras Crocodile Bank	Firstpost
24.12.2020	Velinaattu aamai thiruttu	Dinamalar (Tamil)
24.12.2020	Ariyavagai aamai velinaattuku kadaththappattatha?	Thinathandhi (Tamil)
26.12.2020	Chennai muthalaippannaiyil irunhthu maayamaana ulagin migapperiya aamai	One India (Tamil)
26.12.2020	Aldabra tortoise, Among Largest in World, “Stolen” from Chennai Park	NDTV
26.12.2020	Aldabra giant tortoise goes missing from park	DTNext
28.12.2020	Thieves might have jumped over the side wall and stolen the giant tortoise, says Madras Crocodile Bank director	The Hindu
28.12.2020	A rare Giant Aldabra Tortoise Worth Around Rs 15 Lakhs “Goes Missing: from Madras Crocodile Bank	India Times
28.12.2020	Aldabra Tortoise missing from croc bank stolen with inside help, say cops	Times of India
28.12.2020	Special Police teams formed to trace tortoise missing from Madras Crocodile Bank	The Hindu
12.01.2021	Theft of Rare Turtle Setback to Reptile Conservatory	The Tennessee Tribune
17.03.2021	Crocodile Bank’s Virtual Programmes help enthusiasts study reptiles closely	DT Next
22.03.2021	The Zai Whitaker column| When the music’s to die for; or the challenge of the decibel	First Post
22.03.2021	Two Herpetologists visit Demow Model Hospital-cum-CHC	Sentinel Assam

SCIENTIFIC PAPERS 2020 – 2021

1. Yatin Kalki and Merlin Weiss, Understanding the food habits of the green vine snake (Ahaetulla nasuta): a crowdsourced approach, Herpetology Notes, Volume 13: 835-843 (2020) (published online on 16 October 2020)
2. Crocodile Specialist Group Newsletter, Volume 39, No.2, April 2020 – June 2020
3. Rom Whitaker[18], The ecological importance of crocodilians: towards evidence-based justification for their conservation, Biological Reviews (2020), pp 936-959
4. Chetana Babburjung Purushotham 1 & Benjamin Tapley 2, Checklist of Amphibians: Agumbe Rainforest Research Station, May 2011
5. Gowda, Agnivamshi & Kalki 2020, *Hemidactylus giganteus* Saurophagy, Natural History Notes, pp 599.
6. Nikhil Whitaker and Muthu Srinivasan, Human Crocodile conflict on the Cauvery river delta region, Tamil Nadu, South India. International Journal of Fisheries and Aquatic Studies 2020: 8(5): 01-05
7. Kalki & Huizinga 2020. *Minervarya sp*. Predation, Natural History Notes, pp 566.
8. Romulus Whitaker, Kingdom of the Cobra, Seminar 735, November 2020 , pp 43
9. The National Chambal Sanctuary – Gharial watching on the river Chambal – September 2020

In the news, TV/Documentary & Social media (ARRS)

- 30/07/2020: Ajay was interviewed by newspapers & news channels (Udayavani & GoodmorningKarnataka) regarding snake rescue methods. https://www.facebook.com/1649190791795481/posts/3050979728283240/

- 12/08/2020: Allwin participated in a webinar organised by The Habitat Trust, about ARRS and KCEC work. https://m.facebook.com/story.php?story_fbid=10160092627492538&id=693112537

- 14/08/2020: “Biggest & Baddest” episode released on Discovery Channel showing MCBT and ARRS work.

- 05/09/2020: How researchers are protecting the king cobra – Bindu Gopal Rao. https://www.lonelyplanet.com/articles/researchers-saving-king-cobra

- 10/09/2020: Article published in Prajavani newspaper. https://www.prajavani.net/environment/conservation/the-researcher-conservationist-spreading-love-for-king-cobra-in-the-malnad-region-760468.html

- 14/09/2020: The Zai Whitaker column | Trailing Ajay Giri (From a safe distance) while on King cobra rescue mission – Zai Whitaker.

https://www.firstpost.com/living/the-zai-whitaker-column-trailing-ajay-giri-from-a-safe-distance-while-on-a-king-cobra-rescue-mission-8476341.html?fbclid=IwAR2LrHDoU9JifguzBQxybR-tzlkDy32AtwWWsUxPlDMUbgqiVCi9MSnVrhI

- 24/02/2021: Meet the King Cobra Rescue Team That Saves Both People and Snakes, A research station in India is on call 24/7 to aid wayward reptiles in need – Mahima A Jain. https://www.atlasobscura.com/articles/king-cobra-rescue-india?fbclid=IwAR36AwURiRNC7zTXtezKkiYr0-k33oAmt9W77jE8EFcxml5zVRsP-Uw37zw

- 21/03/2021: Ajay gives an interview about ARRS and KCEC work through a webinar Conflict, Conservation & Coexistence.
  A national conference by the Centre for Wilderness Medicine and Department of Emergency Medicine, Kasturba Medical College, MAHE, Manipal.
  https://teams.microsoft.com/.../19%3ameeting.../0...

MCBT – FINANCIAL DETAILS

Income and expenditure statement 2020-2021

Income

Details	Amount in Rs
Ticket Sales	92,96,200.00
Research Grants	3,93,52,737.79
Donations & Rent	1,70,26,484.82
Environment Education	2,87,830.00
Adopt an Animal	14,28,000.00
Bank Interest	38,03,324.00
Croc Shop sales	5,47,528.00
ANET	548.00
Other income	71,180.00
ARRS	13,93,989.38
Total	**7,32,07,821.99**

Expenses

Details	Amount in Rs
Salary and Wages	92,31,914.00
Reptile Feed Costs	32,29,560.00
Maintenance and Upkeep	23,61,109.00
Pen Maintenance and Upkeep	10,72,676.00
Research	3,42,87,190.96
Environmental Education Expenses	2,20,851.00
ANET	1,250.80
ARRS	18,75,242.00
Croc Shop Expenses	4,47,758.00
Administrative Expenses	31,79,845.54
Total	**5,59,07,397.30**

VISITATION - 2020-2021

Sl.No	Month	Total no of visitors
1	April-2020	Lockdown
2	May-2020	“
3	June-2020	“
4	July-2020	“
5	August-2020	“
6	September-2020	“
7	October-2020	“
8	November-2020	4,824
9	December-2020	13,721
10	January-2021	17,734
11	February-2021	19,606
12	March-2021	17,244
	Total	**73,129**

DONOR LIST 2020-2021

Sl.no	Organisation	Project	Amount (Rs.)
1	Infosys Foundation	Snake conservation & Snakebite Mitigation project	10,00,000.00
2	The Mahim Pandhi Wildlife Foundation	Marsh crocodile monitor movement project	80,000.00
3	SLK Global Solutions Pvt Ltd	Conservation work of reptiles	8,50,000.00
4	Coromandel International Ltd	Vet lab equipment purchase	50,00,000.00
5	Reliance Foundation	Enhancing visitor expenses	2,00,00,000.00
6	Give India Foundation	Snake bite mitigation (google)	53,038.85
7	Vama Sundari Investments (Delhi) Pvt Ltd	Covid - 19 resilience	39,71,000.00
8	Ford Motors Pvt Ltd	Virtual zoo program	8,39,500.00
9	Nukeation Studios	Donation for Covid Relief Fund	20,000.00
10	Dakshin Foundation	Donation for Covid Relief Fund	1,00,000.00
11	TVS Motor Co Ltd	Donation for Covid Relief Fund	10,00,000.00
12	Maani Care	Donation for Covid Relief Fund	70,00,000.00
13	A R Foundation	Donation for Covid Relief Fund	1,00,000.00
14	Fortune Foundation	Donation for Covid Relief Fund	1,00,000.00
15	Deshpande Foundation	Donation for Covid Relief Fund	5,00,000.00
16	Venu Srinivasan (TVS)	Donation for Covid Relief Fund	10,00,000.00

Sl.no	Organisation	Project	Amount (Rs.)
17	Kovilpatti Lakshmi Roller Flour Mills Ltd	Donation for Covid Relief Fund	1,00,000.00
18	Elektrisola India Pvt Ltd	Donation for Covid Relief Fund	3,50,000.00
19	Hamish Ogston Foundation	Snake Conservation & Snakebite Mitigation Project	4,51,592.00
20	Zoological Society of London	Gharial Ecological Project	4,71,800.00
21	Charities Aid Foundation India	Rainforest conservation through research and education	26,00,000.00
22	King cobra Conservation INC	KCEC	4,41,758.00
23	Prague Zoo	Gharial Ecological Project	14,41,072.00
24	The UK Online Giving Foundation	Snakebite mitigation (Google)	7,57,380.00
25	Montgomery Zoo	KCEC	81,239.00
26	International Herpetological Symposium	Snakebite mitigation project	36,210.00
27	Chandrashekaran	KCEC	55,500.00
28	Gautam Ramdas	Donation for Covid Relief Fund	60,000.00
29	Surya Harikrishnan	General donation	72,000.00
30	R.Harikrishnan	General donation	1,50,000.00
31	Priya Harikrishnan	General donation	50,000.00
32	Kamini Sundaram	General donation	1,00,000.00
33	Jeffrey W Lang	Gharial Ecological Project	8,77,440.00

AFFILIATED INSTITUTIONS

(Committees/ Membership/ Collaboration/ Consultation/ Editorial/ Networking)

International Union for the Conservation of Nature (IUCN)
IUCN/SSC Crocodile Specialist Group
IUCN/SSC Tortoise and FWT 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
Nilgiri Wildlife Association, Ootacamund 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)
2. Dr. Kartik Sunagar (IISc)
3. Gerard Martin (Liana Trust)
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