



**Madras Crocodile Bank Trust**  
**Centre for Herpetology**  
Annual Report  
April 2022-March 2023



## From the Managing Trustee

There have been many exciting developments at the Croc Bank this year. It has been great to see the new vet equipment being used, for both preventive and remedial treatment as well as research, and a great help to have Dr Vikram on board. The curatorial team is now complete and one of the focus areas of research is the study of cortisol (stress hormone in reptiles) levels in different species, so cortisol-related data can be used to monitor stress. Research continues in all areas of the Croc Bank's work. The snakebite project continues its studies and surveys to gain a better perspective on the problem and ways in which this deadly disease can be mitigated; the Education Department creates and conducts surveys related to visitor and program response.

The education team is as always looking at ways in which to engage visitors at a deeper level, and the Croc Bank is now the first Indian zoo with VR (virtual reality) videos as part of the interpretation centre. And of course, research continues at our field stations on the Chambal and Agumbe: the Gharial Ecology Project and the Agumbe Rainforest Research Station.

The largest inter-zoo transfer of animals in India continued this year, with over 500 mugger being transferred to the Greens Zoo and Rescue and Rehabilitation Centre (GZRRC) thus far. The extra space created thanks to this transfer, as well as decreased feed and maintenance costs, is a boon for the Croc Bank, which bred 200 mugger per year for ten years for the Tamil Nadu government's rewilding program which it was finally not able to execute for various reasons. We were left carrying the burden of caring for these animals until GZRRC came to the rescue.

Preston Ahimaz joined MCBT as trustee. Our association with him began during the Snake Park days, when the Croc Bank was being planned. Later, he was the Croc Bank manager, after which he joined WWF and then the inspiring afforestation project of the TVS company. Welcome on board, Preston.

And our new website is almost done! Thanks to all the staff who helped us work on it, and make it an exciting and informative space. Strong team work has been one of the strengths of the Croc Bank, since it started in '76.

This takes us back to where our journey began. 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 47 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.

In keeping with our original goal, over 1500 crocodiles were sent to other 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 and the lack of suitable habitats. The Croc Bank's mandate has also extended to crocodilians from other countries. Of the world's 27 species, 15 are housed at the Croc Bank currently. Of these, 4 are listed as Critically Endangered by the IUCN, and 3 as Vulnerable.

Originally designed to be a living repository of crocodilians for genetic safekeeping, the Croc Bank is now no longer confined to crocodile conservation. In 1993, 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.

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 saltwater crocodiles, marine turtles, 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 a few years, Dakshin Foundation partnered with the Croc Bank in the administration and development of ANET. 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 the Agumbe Rainforest Research Station (ARRS). 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 primary refuges of the "king". Other iconic herpetofauna in this biodiversity hotspot include the draco or flying lizard (shown on our cover page), 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. Based on the successful collaboration and achievements at ANET, MCBT entered into a two-year partnership with Dakshin (from January 2022 to December 2023) to develop, manage, and support the research activities of ARRS.

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 this technology, 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).

The Conservation department's activities have expanded this year, the partnership with TREE Foundation continues, with sea turtle conservation, ghost net removal, beach cleaning and building awareness. And last but not least, the breadth of the snakebite mitigation project grows apace, with meetings, workshops, programs, coming in thick and fast. As always, the focus is on prevention.



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.

## From the Director

This has been a good year for Croc Bank. Visitor footfall has increased considerably and we welcomed the change after the prolonged pandemic lull. The various departments geared up to meet the challenge and activities were planned and executed.

The manager was on his toes keeping the zoo premises neat and tidy. The vet lab extension was completed, Turtle Haven and visitor restrooms were renovated, display boards were repainted and crocodile pens were repaired wherever required.

The curatorial, veterinary and education teams worked together to conduct programs and workshops throughout the year. Volunteers and interns helped out with many tasks and conducted specific projects assigned to them. The adoption program expanded, thanks to our well-wishers. Downsizing the zoo in terms of muggers numbers has opened up new avenues. We are all set to bring in more species to increase our repertoire to create unique experiences for the visitors.

The Conservation Officer has continued to fight the noise mitigation issue. The Snake Conservation and Snakebite Mitigation Project Coordinator has represented Croc Bank in several forums and conferences both in India and abroad.

I participated in the Google Summit 2022 in California, which led to fruitful interaction with



participants from other zoos across the world. A meeting with the founder of Global Snakebite Initiative along with the head of the Tamil Nadu Foundation in the US has led to the possibility of funding opportunities for our Snakebite Mitigation project. The Rotary Club of Chennai, East is now in the process of linking up with their counterpart in California to promote this venture.

I also attended the National Conference for Zoo Directors, organised by CZA, at Bhubaneswar and Mysore and shared a presentation on Croc Bank and its activities. It led to interactions with the Minister of State for Environment Forest and Climate Change, Chairperson CZA, Member Secretary CZA and the Deputy Inspector General CZA. It was great to network with the other zoo directors, and discuss our collective challenges, triumphs and hopes for the future.

## TRUSTEES- MCBT (2022-2023)

Ashish Gupta

Samit Sawhny

M.M. Venkatachalam

Kamini Sundaram

Venu Srinivasan

Meera Anna Oommen

Nikhil Whitaker

Preston Ahimaz

### **Ex Officio Trustees:**

Rom (Romulus) Whitaker (Founder)

Zai (Zahida) Whitaker (Founder)

## STAFF- (2022 TO 2023)

### Admin and Departments

Managing Trustee	Zai Whitaker
Director	Pramila Rajan
Curator	Nikhil Whitaker
Assistant Curator	Angeline Samuel
Zoo Manager	T Senthil
Education Officer	Steffi John
Assistant Education Officer	Timple Madhumitha D.
Veterinarian	Dr. Ruchika Lakshmanan
Junior Veterinarian	Dr. Vikram Thiruvavarur
Conservation Officer	Ganesh Muthiah
Project Coordinator, Snakebite Mitigation	Gnaneswar Ch
Managing Editor, Hamadryad	Caleb Daniel
ARRS- Field Director	Ajay V Giri
ARRS – Base Manager	S.S. Jayakumar (Till October)
ARRS- Research Coordinator	Martina Anandam (From 1 <sup>st</sup> October)
Gharial Ecology Project- PI	Dr J.W. Lang
Gharial Ecology Project -Coordinator	Jailabdeen A

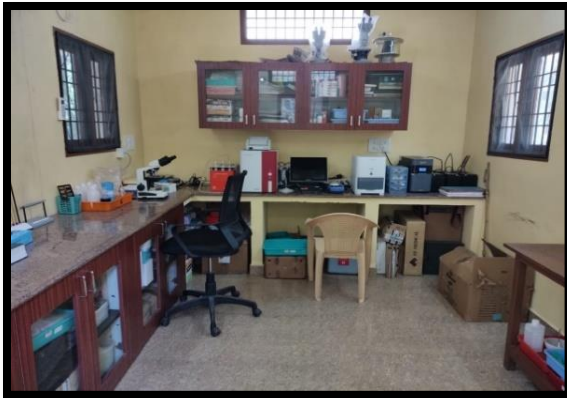
## Accounts, Husbandry and Maintenance

M. Mohan	Accountant
M. Pavithra	Assistant Accountant
V. Gangadurai	Chief Reptile Keeper (Retired on 5 <sup>th</sup> June)
S. Nagarathinam	Chief Reptile Keeper
L. Gunasekaran	Maintenance Supervisor
V. Mohanasundaram	Curatorial Research Assistant
T. Mohan	Supervisor, Entrance and Pen watchers
C. Purushothuman	Senior Office Assistant
N. Selvamani	Ticket Checker
R. Gnanamurthy	Ticket Checker
E. Amutha	Enclosure Maintenance and Housekeeping
V. Yuvarani	Enclosure Maintenance
J. Shanthi	Chelonian Keeper
S. Janakiraman	Animal Keeper
G. Gowri Shankar	Animal Keeper
P. Boopalan	Assistant Animal Keeper
N. Pushparani	Croc Shop Operator
G. Ashok Somai Magar	Chief Cook
A. Kumari	Maintenance and Cook
S. Mohan	Cleaning and Maintenance Assistant
K. Elumalai	Maintenance Assistant
M. Ramu	Driver
Tek Bahadur Somai Magar	Security Guard
Budibal Somai Magar	Security Guard
Krishna Bahadur Somai Magar	Security Guard

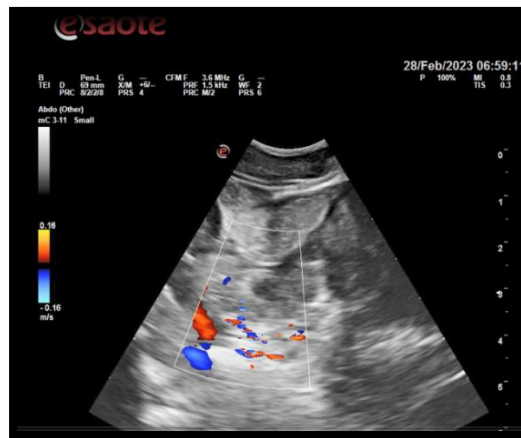


# CURATORIAL AND VETERINARY TEAM

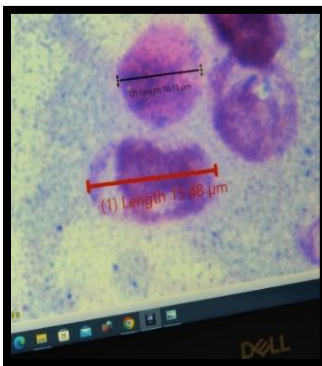
## Development - Veterinary



*The vet lab extension was completed in August and the new room is now used for X-rays, sonography and endoscopy.*



*An Esaote Ultrasonography unit with echocardiography and colour doppler was installed for cardiology, pregnancy and abnormality diagnosis.*



*An Olympus BX 43 microscope with SC 180 camera was purchased and installed for in-depth studies and diagnosis.*

An agreement was signed with the G.J. Multiclave Biomedical Waste Agency for responsible waste management.

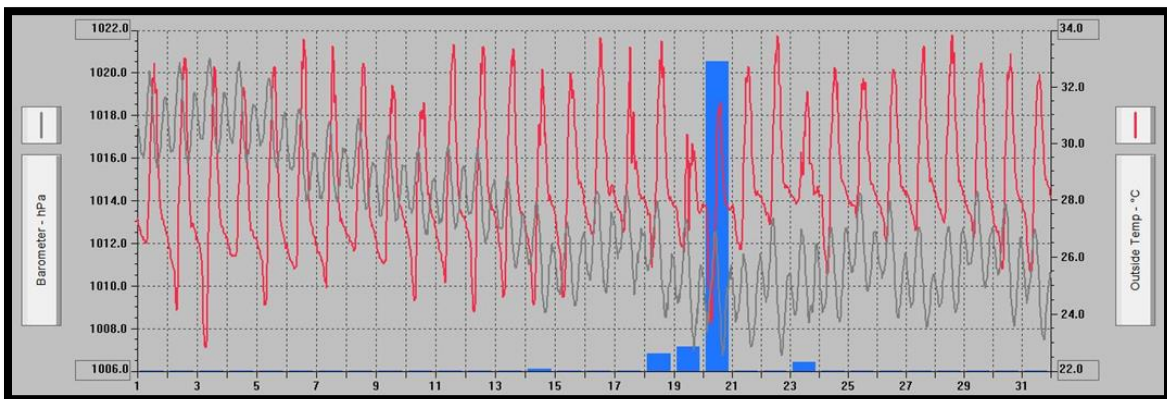
The Junior Veterinarian Dr Vikram joined the team and has been conducting diagnostic studies like manual blood counts, parasitology and basic microbiological tests.

The vet attended the "Capacity Building Workshop for Zoo Biologists" organised by the Central Zoo Authority and hosted by GZRRC, Jamnagar, between 21<sup>st</sup> and 24<sup>th</sup> March.

### Development-Curatorial



A weather station (Vantage Pro 2 Plus with UV and Solar Radiation Sensors) was installed which records a variety of environmental variables, ranging from temperature, rainfall, humidity, solar energy, barometric pressure, wind speed and direction, UV index and others. This has helped to correlate seasonal behavior of reptiles like egg-laying and also predict weather conditions.



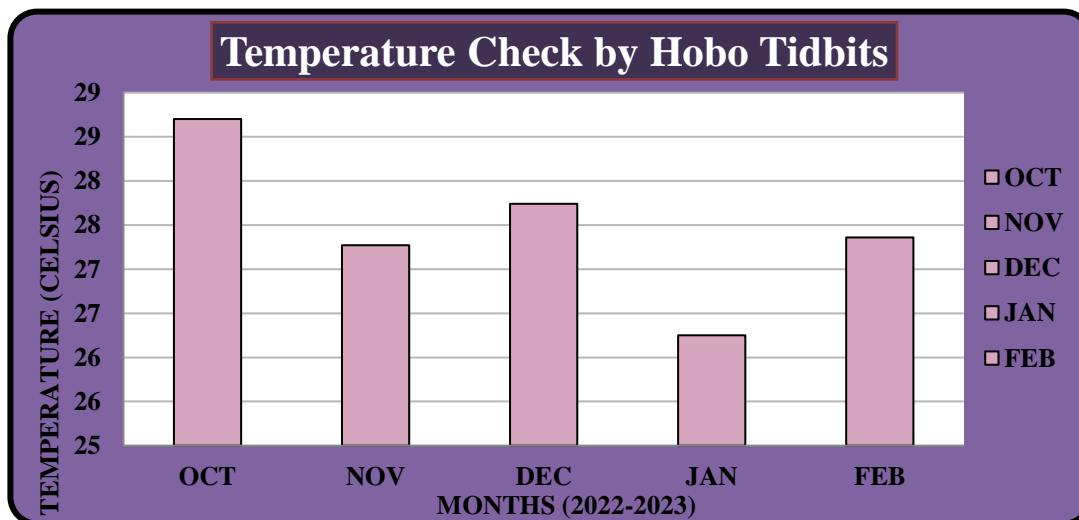
Weather station data showing temperature (red), barometer pressure (grey) and rainfall (blue) for the month of March.



Osram ultra vitalux 300W 230V E27 UV bulbs were introduced for UV A and UV B radiation. This has improved metabolism and the general health of animals.



The HOBO Tidbits MX-1101 temperature loggers (wireless communication) are used for recording and monitoring temperature in reptile enclosures.



Temperature maintenance at POTZ (Preferred Optimum Temperature Zone) through monsoon and early summer months for juvenile gharials.



The Assistant Curator attended the "Capacity Building Workshop for Zoo Biologists" conducted by the Central Zoo Authority and hosted by Nehru Zoological Park, Hyderabad, between 23rd and 25th November. The workshop was focused mainly on Data Management and Animal Enrichment.

The Curator attended the Annual Research Conference, on 16<sup>th</sup> February, at the Advanced Institute for Wildlife Conservation, Vandalur, and presented his work on radio telemetry on the mugger in the Cauvery River, Tamil Nadu.

As part of an exchange program between MCBT and The Liana Trust (TLT), Rathnapuri, the curator of TLT Lisa Gonsalves, worked with the MCBT curatorial team under the guidance of the Curator for six days. MCBT's assistant curator visited TLT for one week and worked with Gerry Martin, a long-term associate of MCBT.

Feed quantities have been revised following the transfer of animals to GZRRC.

Two additional keepers were hired for snake husbandry.

## Research

Using the IDEXX haematology and biochemistry analyser, blood values and blood count via manual techniques such as blood smear examinations are being co-related. Differential stains and techniques are also being standardized.

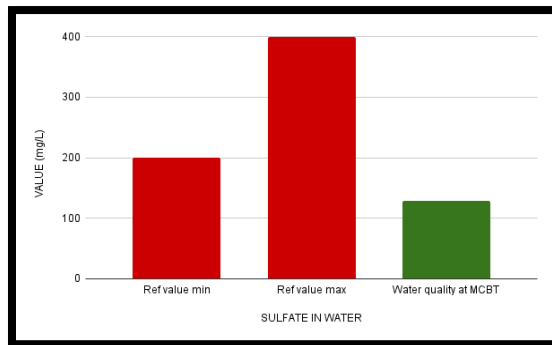
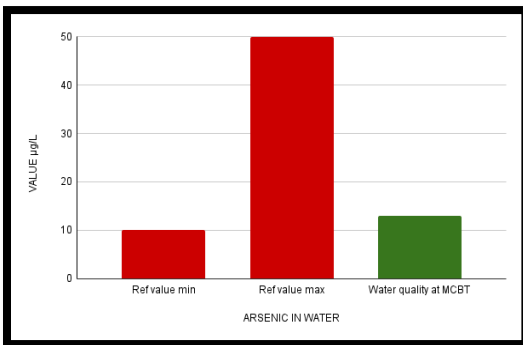
An MoU was signed with Laboratory for the Conservation of Endangered Species (LaCONES), for one year, and necessary permissions were received for genetic research for the critically endangered turtles red-crowned roof turtle, three-striped roofed turtle and northern river terrapin. The first phase of the genetic screening started in October. Blood samples were collected from the founder and progeny population of these species, and sent to LaCONES for genetic analysis.



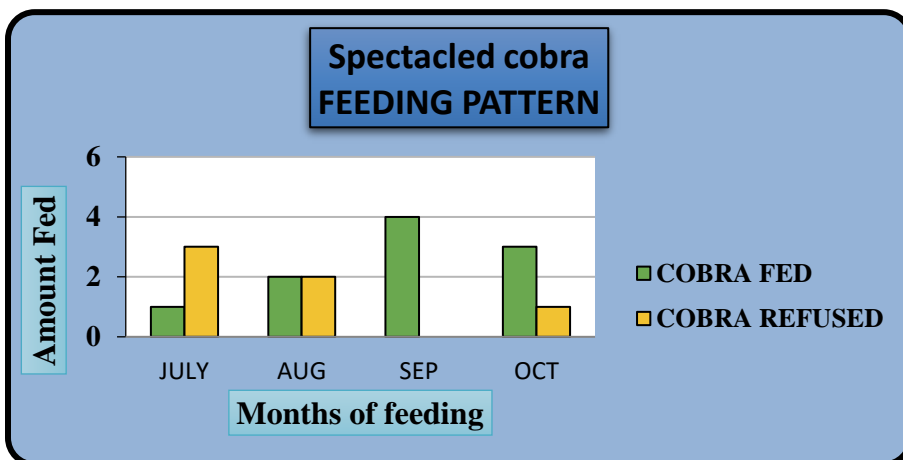
*Digital Vernier calipers were purchased and are being used for accurate egg and hatchling measurements.*



A new research initiative "Analysing the Impact of Sound on Crocodile Behaviour" for addressing human-croc conflict is on-going in association with Dr Sanjoy Deb. Preliminary trials were conducted on using sound as a repellent to crocodiles in December.



Water sampling with the Tara Life Kits has been prioritized and samples are being analyzed for specific enclosures/water sources at different intervals depending on the species present and water type. Tests for new components such as arsenic and sulphate have been added, and results were found to be well within permissible limits. All animals were routinely measured and weighed to assess their growth and health.



Feeding pattern observed in the spectacle cobra before and after UV bulb installation.

Students from the Madras Christian College are doing a study at Croc Bank on gharial thermal selection, with 2-3 students visiting the zoo on weekends.

## Veterinary treatment and care



*X-ray machines were used to non-invasively identify the gravid state of animals (Aldabra tortoise, Morelet's crocodile, Yacare caiman and yellow anaconda) for improved husbandry practices.*

For assessing their general health, blood was collected from mugger in Pen 10, dwarf caiman, and red-crowned roof turtles. Based on previous publications, the values are being standardized and validated using the IDEXX Hematology/Biochemistry Analyzer.



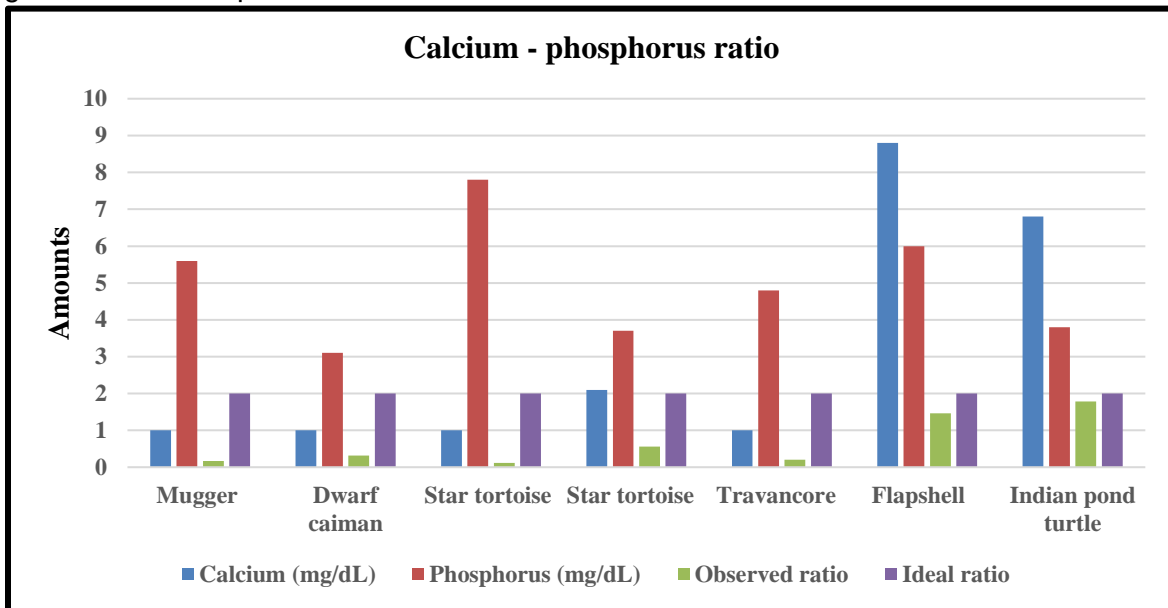
*The newly purchased pole syringe helped to successfully treat our female reticulated python without capture/restraint.*



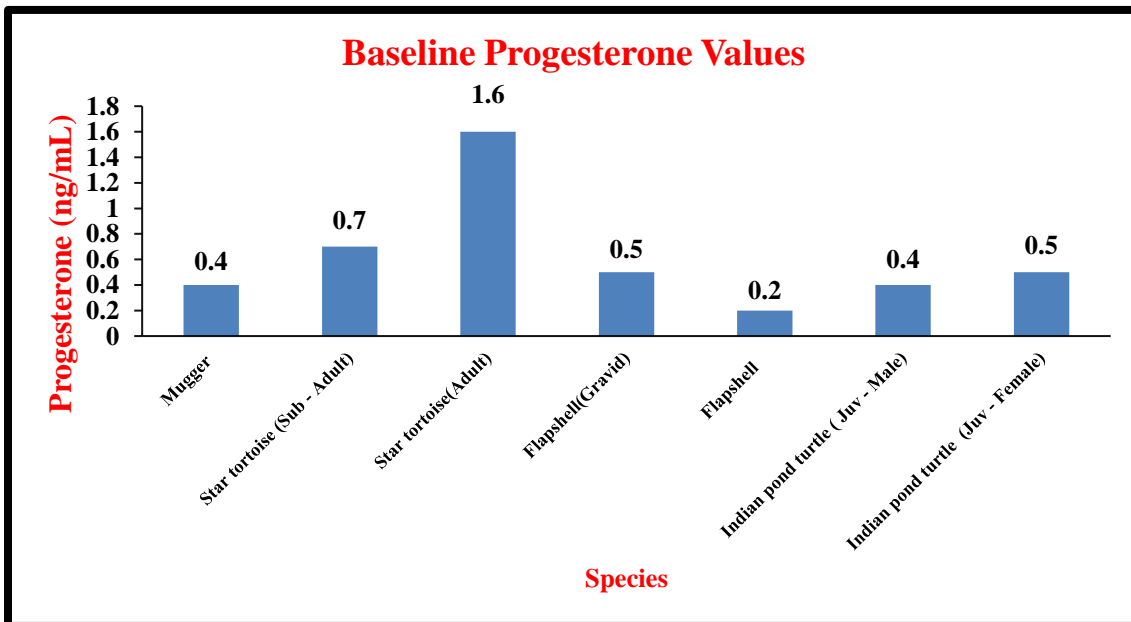
Our adult female American alligator (Ally) sadly passed away in December. A thorough necropsy was done, and samples were collected. These were sent for processing to various advanced laboratories to determine the cause of death.

Clinical nutrition studies are being conducted to monitor growth and development.

Progesterone assay is being worked on to derive baseline values. It will be a non-invasive procedure once standardized to detect sex and gravid status of reptiles.



*Blood Analysis showing results of the Ca:P ratio in different reptiles*



*Baseline Progesterone values being assessed.*

### Conservation breeding

No	Species	Eggs laid	Hatched	Remarks
1	Travancore tortoise	02.11.21	01.04.22 14.06.22 02.08.22	Thriving, and feed amounts are regularly monitored.
2	Tomistoma Pen 18 (only one egg)	01.05.22	NA	Not fertile.
3	Morelet's crocodile (Pen 23A, 25C, 15A, and PP3)	12.06.22 to 26.06.22	-	All infertile.
4	Saltwater crocodile Pen 12A, 12B & 17	24.03.22 to 29.04.22	23.07.22	Four juveniles hatched, and one died.
5	Gharial	22.03.22	22.05.22	Five gharials were hatched, and one died.
6	Siamese crocodile (Pen 6)	12.05.22	-	10 out of 19 were fertile.
7	Spectacled caiman (Pen 14 and 25A)	18.05.22 and 20.05.23	-	The eggs from Pen 14 were all infertile (no male); from Pen 25A, four out of 14 were fertile.
8	Cuvier's dwarf caiman	05.07.22 & 08.08.22	08.11.22	All fertile. Ten eggs were incubated, and one hatched, but the juvenile died.
9	African slender-snouted crocodile	16.07.22	-	All infertile.
10	Whitaker's sand boa	27.07.22	Seven live births	Animals are healthy and doing well.
11	Yacare caiman	27.08.22	-	All infertile.
12	Travancore tortoise	27.08.22 to 27.09.22	-	Three females laid seven eggs. Eggs are under incubation.
13	Yellow anaconda	07.09.22	20 live births	19 healthy and feeding well. One had a congenital anomaly and died shortly after birth.
14	Northern River terrapin	21.03.23	-	Twenty-four eggs were laid. All are under incubation.
15	Gharial	07.03.23		44 eggs were laid and 32 viable eggs are in incubation.
16	Red-crowned roofed turtle	23.12.22		8 eggs were laid and 3 viable, there was only one hatchling that did not survive past a day.
17	Three-striped roofed turtle	23.12.22		12 eggs laid, 3 viable, and none hatched.



*Saltwater crocodile laying eggs, hatching of Travancore tortoise & gharial eggs hatching.*



*Saltwater eggs hatching, live births of yellow anaconda, and Whitaker's sand boa.*



*Dwarf caiman hatchling, three-striped roofed turtle hatchling and northern river terrapin egg collection.*

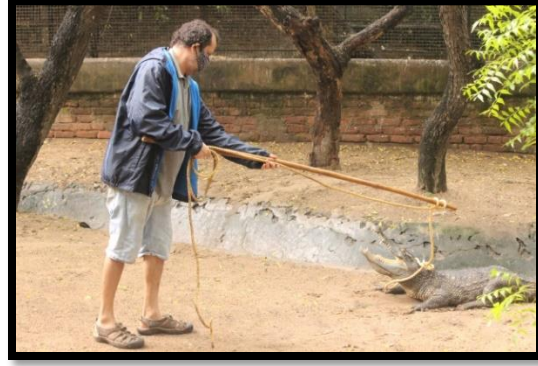
### **Transfers out of MCBT**

Transfers to GZRRC, Gujarat:

Whitaker's sand boas, Travancore tortoises, Indian star tortoises, Indian flap shell turtles, Siamese crocodiles, Nile crocodiles, Morelet's crocodiles, gharials and dwarf caimans in May.

Nile crocodiles, Morelet's crocodiles, gharial, and Indian rock pythons in July.

240 mugger in September, 120 in October and 120 in December, 110 in January and 113 in Feb.



*GZRRC transfer operations.*

## **Volunteers**

The volunteer program is gaining momentum after the pandemic. Wildlife enthusiasts, students from science backgrounds, professionals, and people who wanted to learn more about reptiles and MCBT made it to the list of volunteers this year.

NAME	BATCH	PROJECT
Anushree Sharma	21/7/22 to 30/7	Visual cue training-Aldabra tortoises
Irfan Ali K	21/7/22 to 10/8	Dive duration of gharial
Nihar Saxena	21/7/22 to 19/8	Travancore tortoise observation
Samuel Dillon Gene	1/9/22 to 30/9	Animal husbandry
Aditya Mahajan	11/10/22 to 9/11	Travancore tortoise observation
Ariane Teberüz Bilgen	20/11/22 to 22/11	No project- Left early
Pratibha P	9/2/23 to 23/2	Basking behaviour of turtles -Pen 24
Sanchita Banerji	9/2/23 to 23/2	Dive duration of gharial
Suraj Narayan	21/3/23 to 19/4	Travancore tortoise observation
Param Vikram Bagade	21/3/23 to 4/4	Dive duration of gharial



## SOME GLIMPSES OF CHANGES AT CROC BANK THROUGH THE YEAR



*The AV room got a facelift, inside and out.*



*The vet lab was extended.*



*Turtle Haven was renovated.*



*The World's Crocodiles board was repainted.*

# CONSERVATION

## ECR Conservation Program

The ECR Conservation Program is a community – based project to spread knowledge and counteract human- induced threats to the environment on the coast of Kovalam to Nameli Village of Mamallapuram, Tamil Nadu. On 14<sup>th</sup> Feb, a half day awareness program was conducted in MCBT. The agenda of the ECR Conservation Program is (1) Sea turtle Conservation, (2) Noise Mitigation, (3) Waste Management and (3) Snakebite Mitigation & Snake Conservation. A group of 50 fisherfolk from seven coastal villages of Mamallapuram were the beneficiaries of this program. Gifts and lunch were sponsored by Tree Foundation.



## Sea Turtle Conservation Project



Conservation of sea turtles, protection of nests, both in-situ and hatchery-based were carried out from January to date, along the coast from Kovalam to Nemeli Kuppam Village. MCBT in association with the Sea Turtle Protection Force members of Tree Foundation, Chennai and trained fishing community youth, patrolled the beaches throughout the nesting season between the months of January and April. Checking poaching, mapping nest locations, recording distance from high tide line, time of nesting, relocating inundated nests, recording environmental parameters, maintaining nest temperatures and releasing hatchlings were carried out.

## Noise Mitigation Project

As part of the second phase of the noise mitigation project, Prof. Chandramouli, from IIT Madras, released the Updated (Second) report on '*Anthropogenic Noise Levels in Madras Crocodile Bank due to Events at Sheraton Grand Chennai Resort & Spa*' dated 25.05.2023. Subsequently the Digital Sound Meter Calibration report was released on 26.12.2022. On 24.03.2023, a meeting was organised with the management team of Sheraton to discuss the design and installation of the acoustic barrier. The Sheraton Team was advised to initiate the study and design of acoustic barrier to mitigate noise.





# EDUCATION

The Education Department had a successful year with new ideas and content for programs, project and posts. The programs and talks engaged a wide range of audiences and also brought in more organic traffic to the park through social media and collaborations.

## Park Talks

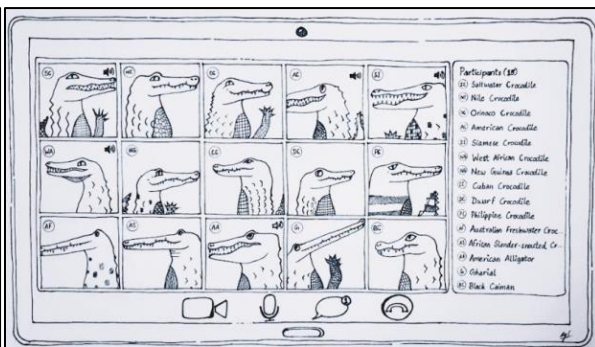
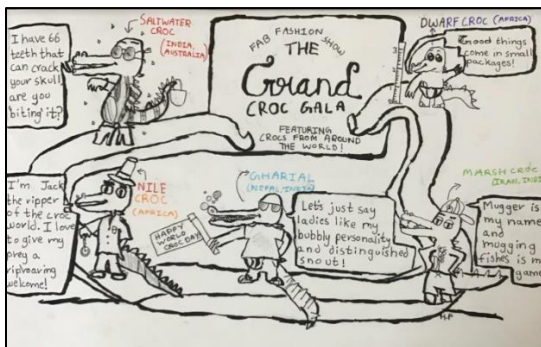
Mugger, Morelet's crocodiles, Asian water monitors and iguana feed talks and snake talks were regularly given during weekends and public holidays. Question time was as always, lively and interesting.



## World Days

### World Crocodile Day, June 17<sup>th</sup>

A doodle contest, Croc-A-Doodle-Do! was conducted for all age groups. Three winners were selected and one special mention was made. Results were posted on our Social Media pages and winners were given a prize kit each.



## World Snake Day, July 16<sup>th</sup>



*Art work related to the awareness and conservation of snakes was collected from schools and individual participants and displayed at Snake Haven and Reptales. Snake talks were given to raise awareness about snake encounters and snakebite mitigation.*

## Wildlife Week October 2<sup>nd</sup> to 8<sup>th</sup>

MCBT celebrated Wildlife Week with posts and programs from 2<sup>nd</sup> to 5<sup>th</sup> October followed by a program in partnership with Mumbai Children's Museum from Oct 6<sup>th</sup> to 9<sup>th</sup>. A face painting contest was conducted online. The winner's names were posted on our Social Media pages and they were presented with a gift kit each.

## Networking

Assistant Education Officer Timple Madhumitha D joined the Croc Bank team on April 15. She was among 50 candidates selected from NGOs for 'Spotlight series 2023' by OTTER (Online Tech Training Engagement Resource). She participated in 6 virtual training sessions on tools that help NGOs with data management and communication. She also attended the National Capacity Building Workshop conducted by CZA at the Mumbai zoo from 15<sup>th</sup> to 17<sup>th</sup> February.

Through the International Zoo Educators Association (IZEA), the Education Officer was selected for a Job Experience Program with Zoo Brno in the Czech Republic in February. This opportunity gave her an international perspective on zoo education and helped her to explore new ideas and activities. Zoo Brno also has a Virtual Reality (VR) facility, like the one at MCBT.

The Earth Educators Programme is a fellowship that brings together young volunteers for the environment, emerging conservationists and school teachers. In India 15 participants were selected for the year 2022 - 2023 and the Education Officer was one of them. They embarked on an 11-month journey to explore the natural world, curate immersive learning experiences for students, build skills, and create a community to lead conservation action in their locality.

The Education Department maintained photo and video records of the animal transfers to GZRRC.



## Virtual Reality (VR) Centre

The VR centre was inaugurated at the Croc Bank on 23<sup>rd</sup> July, with 15 VR headsets from Wild Immersions, France. Croc Bank is the first zoo in India to introduce this facility. It was open to all visitors, free of cost, on the first day. From the second day it was ticketed at 40 rupees per person. 12 revolving chairs were purchased for the centre for visitors to enjoy the 360-degree view. The VR centre has received a lot of positive feedback from visitors for being a fun activity and at the same time very informative and affordable. It ran for a total of 94 days during the period of this report.

## IIT Madras

IIT Madras shot virtual reality footage at the Croc Bank. The narration for the videos was done by Zai Whitaker, where she talks about the work that MCBT has done so far. The three videos are now shown to visitors at the VR centre. 40 IIT team members visited the park, watched the videos at the centre, and interacted with MCBT staff.



## Project 2022-2023: Ford

The objective of this year's project funded by Ford was to raise awareness about reptiles through innovative VR technology, and educate students from government schools from grades 6 to 10 in the districts of Chennai, Kanchipuram and Chengalpattu on snakebite prevention and conservation. The program was articulated around 3 main axes:

1. **Image:** VR films showing reptiles from around the world in their natural habitats.
2. **Message:** Live presentations to develop empathy towards reptiles.
3. **Material:** Handing out fun learning materials to children.

The VR kits act like a "Mobile Zoo" and 1019 students and 61 teachers benefitted from this project. It was also presented at the Partner- Connect meeting at Ford, and a one-day volunteering program was conducted for 50+ Ford employees and their family members at Croc Bank.



## Educational Programs and Events



Educational programs were both offline and online as the online trend continues to be popular after the pandemic. Special programs were conducted on long holidays with different themes and ideas. The total number of programs was 85 (6 virtual programs and 79 in-person programs) and the number of participants 2704.

Programs	DATE	NUMBER
Guided tour for Nishanth College group	Apr 1 <sup>st</sup>	34
KC High School- Zoo visit 1st graders	Apr 5 <sup>th</sup>	50
Guided tour	Apr 8 <sup>th</sup>	5
Child Centric Educational Program	Apr 8 <sup>th</sup>	15
Snake Walk	Apr 10 <sup>th</sup>	19
Be a Zookeeper	Apr 16 <sup>th</sup>	13
Creative program	Apr 16 <sup>th</sup>	45
Virtual tour & venom extraction	Apr 17 <sup>th</sup>	11
Be a Zookeeper	May 7 <sup>th</sup>	18
Reptile Encounter	May 17 <sup>th</sup>	8
Be a Zookeeper	May 21 <sup>st</sup>	17

Be a Zookeeper	Jun 4 <sup>th</sup>	13
Guided tour	Jun 22 <sup>nd</sup>	2
Guided tour	Jul 7 <sup>th</sup>	7
Guided tour	Jul 10 <sup>th</sup>	5
Reptile Encounter	Jul 16 <sup>th</sup>	18
Snake Walk	Jul 17 <sup>th</sup>	12
Guided tour	Jul 20 <sup>th</sup>	3
Reptile Encounter	Jul 22 <sup>nd</sup>	5
Guided tour	Jul 26 <sup>th</sup>	4+7
Ramachandra School program	Aug 5 <sup>th</sup>	145
Snake Walk	Aug 7 <sup>th</sup>	15
Ramachandra School program	Aug 12 <sup>th</sup>	165
Zoo Babies	Aug 14 <sup>th</sup>	15
Reptile Encounter- Orangetree Montessori School	Aug 17 <sup>th</sup>	16
Vruksha School-camp	Aug 26 <sup>th</sup> & 27 <sup>th</sup>	15+3
Vruksha School-camp	Sept 2 <sup>nd</sup> & 3 <sup>rd</sup>	15+3
Guided tour for Dr.Aravind and group	Sept 4 <sup>th</sup>	7
Nature's Eye - virtual program	Sept 10 <sup>th</sup>	11
Reptile Encounter	Sept 11 <sup>th</sup>	7
Reptile Encounter- Campus K	Sept 13 <sup>th</sup>	24+4
Zoo Birthday- Daksha	Sept 18 <sup>th</sup>	20
Ford Volunteering Program	Sept 19 <sup>th</sup>	73
Guided tour	Sept 20 <sup>th</sup>	1
Snake Walk	Sept 25 <sup>th</sup>	14
Reptile Encounter- Kodaikanal International School	Sept 29 <sup>th</sup>	16
Reptile Encounter	Oct 4 <sup>th</sup>	6
Mumbai Museum	Oct 6,7,8,9	50
Reptile 101 workshop The Indian Public School	Oct 7 <sup>th</sup>	30+2
Reptile Encounter	Oct 21 <sup>st</sup>	12
Diwali Bash(Night Safari included)	Oct 28 <sup>th</sup> & 29 <sup>th</sup>	6+6
Reptile Encounter	Nov 6 <sup>th</sup>	14
Snake Walk	Nov 13 <sup>th</sup>	16
Zoo Babies Virtual	Nov 13 <sup>th</sup>	15
Guided tour	Nov 18 <sup>th</sup>	4
Reptile Encounter-Nandavanam Centre for learning	Nov 25 <sup>th</sup>	16+1
Reptile Encounter-MNC	Nov 25 <sup>th</sup>	27
Chettinad School program	Nov 30 <sup>th</sup>	13
Anthea School program	Nov 30 <sup>th</sup>	8
Rex International Matriculation School	Dec 3 <sup>rd</sup>	37+12
Turtle Haven Adopters	Dec 4 <sup>th</sup>	25

Gurukshetra School Reptile Encounter	Dec 8 <sup>th</sup>	164+12
Reptile Encounter	Dec 15 <sup>th</sup>	8
IIT Reptile Encounter	Dec 20 <sup>th</sup>	40
Guided tour	Dec 22 <sup>nd</sup>	8
Guided tour	Dec 23 <sup>rd</sup>	5
Snake Walk	Dec 25 <sup>th</sup>	6+2
Zootopia	Dec 25 <sup>th</sup>	12
Guided tour	Dec 25 <sup>th</sup>	5
Virtual Lunch Date	Dec 31 <sup>st</sup>	8
Gurukshetra School Reptile Encounter	Jan 12 <sup>th</sup>	153+12
Happy Miles Reptales	Jan 15 <sup>th</sup>	19+3
Be a Zookeeper	Jan 21 <sup>st</sup>	3
Nature's Eye Virtual Program	Jan 22 <sup>nd</sup>	7
Redwood school Reptile Encounter	Jan 25 <sup>th</sup>	32
Chettinad school Reptile Encounter	Jan 27 <sup>th</sup>	70+15
Snake Walk	Jan 29 <sup>th</sup>	18
Reptile Encounter for Gharial Pen 13 Adopters	Jan 29 <sup>th</sup>	2
Reptile Encounter Shree Niketan Patasala	Feb 3 <sup>rd</sup>	174+18
Reptile Encounter St. John's School	Feb 4 <sup>th</sup>	62+18
Reptales- Sir M Ct Muthiah Chettiar Boys HSS	Feb 8 <sup>th</sup>	271
Guided tour	Feb 10 <sup>th</sup>	25
Reptile Encounter Shree Niketan Patasala	Feb 11 <sup>th</sup>	191+15
Guided tour for IAS officer and family	Feb 18 <sup>th</sup>	3
Reptile Encounter	Feb 19 <sup>th</sup>	29
Guided tour Nursery gharial adopters	Feb 24 <sup>th</sup>	2
Birthday party	Feb 28 <sup>th</sup>	30
Akshar Arbol International School	Mar 14 <sup>th</sup>	25+5
Akshar Arbol International School	Mar 14 <sup>th</sup>	14+2
Birthday Party	Mar 18 <sup>th</sup>	13+3
Guided tour for Wildlife Warden	Mar 25 <sup>th</sup>	4
Adra School Reptile Encounter	Mar 25 <sup>th</sup>	13+3

## Night Safari

Night safari bookings were made through email, calls and messages. Many people showed an interest in exploring the park after dark. They were excited to see the eye-shine and nocturnal activities of crocodiles as well as the free-ranging fauna of the park. There were 507 participants during the year.



## Adoption

Response to the adoption drive in '22-'23 was good. All the enclosures on display have now been adopted by individual supporters and organizations. Wooden boards displaying the donor's names were put up for enclosure adoptions. Every adopter was given a thank you kit, birth certificate of the animal they adopted and a certificate of adoption. Many people adopted for special days like birthdays and anniversaries. This year saw numerous adopters renew their term and maintain a good relationship with the organization by supporting programs as well.

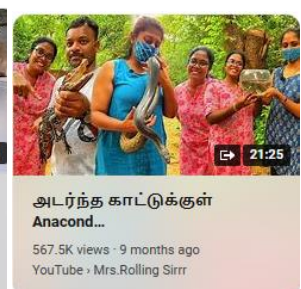
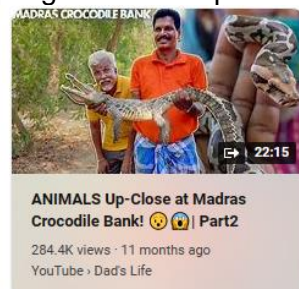
## Content Creation



New education content was curated , such as worksheets, quizzes, posters, and hands-on activities.

## Collaborations

Bhoomi organization connected with corporate companies and brought a group of 30 volunteers in March for beach cleaning and tree-planting activities on the beach adjacent to MCBT. 25 pandanus saplings were also planted.



MCBT conducted video collaborations with YouTube and TV channels to increase outreach. The channels that collaborated with us were Dad's Life, OneIndia Tamil, Mrs. Rolling Sir, Travel XP, Clapboard culture, News 7 Tamil, Behindwoods, JFM views and Big Bang Bogan. The subscribers of

the channels often booked with us for programs and visited the park after seeing the videos.

## Social Media

During “22-’23 the total number of followers on Instagram increased from 16.7k to 18.3k. “Follow us” posters with QR code links that direct people to Croc Bank’s Instagram page were put up at various places in the zoo. Social media platforms were also used to announce contests, book programs and give information that people requested. Program posters were designed and created. The Madrascrocbank page was tagged by people who posted pictures of their visit.

## SNAKEBITE MITIGATION & SNAKE CONSERVATION

### Outreach and Capacity Building

Between ‘22 and ‘23, the team conducted over 160 educational programs and 13 capacity building workshops in several states. Stakeholders included school, farmers, health workers, Forest Department, and others. Over 5000 information posters were distributed and 7 public walls painted with educational information about snakebite.



### Technological Interventions

MCBT partnered with Tamil Nadu Forest Department, indiansnakes.org and University of

Reading to develop 'SARPA TN', a mobile app that helps to call a snake rescuer, identify snakes, locate the nearest hospital and learn more about snakes through watching its educational films. This app is already being used in Kerala since December 2021 with over 15000 users but is the first of its kind in Tamil Nadu. An online guide to Indian snakes and contacts of snakebite experts are the key advantages of this app, which is in the beta testing stage and will soon be implemented in the state. Snake rescuer training and certification programs will be conducted. Seed funding for this project is from the University of Reading, United Kingdom.

### **Interacting with the Government**

The Ministry of Health and Family Welfare, Government of India has formed an expert committee to implement the National Action Plan to Prevent and Control Snakebite Envenoming (NAPSE). MCBT was invited as experts for outreach and NGO activities and there were several consultations with various stakeholders. The Action Plan will be implemented across India involving NGOs and researchers.

In Tamil Nadu, MCBT has been inducted as a member of the Tamil Nadu Snakebite Task Force to train people on capacity building across the state. The team is also developing educational material and videos on training for the state health department. Moreover, the Industries and Commerce Department, Government of Tamil Nadu, has accepted its proposal for the pilot project to develop the Irular Serpentarium. The proposal is in its final stage of discussions for project funding in the next financial year.

As a part of G20 summits, Civil Society 20(C20) meetings are being held regularly. MCBT has been identified as a partner for the C20 meetings to prepare a policy document. Over the next few months, it will collaborate with more organizations to submit a recommendation document for G20.



### **Conferences/Meetings attended**

1. **Oxford Venom Conference** – The Snakebite Coordinator Gnaneswar Ch presented about MCBT's multi-disciplinary project. He also won the conference's photography competition.

2. **NAPSE Consultations** - He participated in the national consultations of the Ministry of Health and Family Welfare, New Delhi, where challenges and solutions regarding snakebite envenoming were discussed.
3. **World Congress of Toxinology** – He presented MCBT’s multi-disciplinary project at this conference in Abu Dhabi, UAE and won the best poster presentation award.
4. **TN Snakebite Task Force** - Rom Whitaker and the Coordinator participated in these meetings in Chennai, to discuss conducting educational and capacity building programs.
5. **Serpentarium meetings** – The MCBT Director and Snakebite Coordinator have been meeting the Department of Industries and Commerce in Chennai to finalize the pilot project for developing the Irular Serpentarium.



# AGUMBE RAINFOREST RESEARCH STATION (ARRS)

## Human-Snake Conflict Mitigation Project (HSCMP)

During this period, a total of 212 distress calls were received from the Forest Department and the community. 107 king cobras were rescued, and 23 individual king cobras and 7 pairs observed. Other rescues included 55 spectacled cobras, 10 pythons, 7 rat snakes, 1 Russell's viper and 1 Montane trinket snake. The team also assisted the Forest Department officials in a leopard rescue operation. Every rescue call was used as an opportunity to create onsite awareness among local communities and distribute information materials.



King cobra under the roof tiles of a house



Russell's viper inside a burrow

## Education Outreach work



3<sup>rd</sup> April- interaction with doctor trainees from Bangalore.



6<sup>th</sup> June- on the occasion of World Environment Day-2022, Karnataka Forest Department, Agumbe and ARRS staff planted seeds inside ARRS premises.



9<sup>th</sup> September- on the occasion of International Snakebite Awareness Day, Kasturba Medical Collage/Centre for Wilderness Medicine (KMC) Manipal conducted an awareness program for MBBS students, PhD scholars, interns and faculty. ARRS Field Director Ajay Giri was invited to talk about king cobra research and conservation work.

28<sup>th</sup> September- a one day workshop for Village Forest Community (VFC) was organised by the Koppa Forest Department. ARRS Field Director was invited to speak on snake awareness and snakebite mitigation.

24<sup>th</sup> January- ARRS interacted with students of the Samse High School, and explained the key concepts of snakebite mitigation and research work conducted at ARRS.

29<sup>th</sup> January- ARRS conducted a short program for BSc final year students from Venkatramana SVS collage, Bantawal. A presentation on snake biodiversity, king cobra research and ecology and snake bite mitigation was shared with them.

3<sup>rd</sup> February- a forest fire awareness campaign conducted by the Koppa Forest Department. ARRS was invited to conduct an awareness program on snakes, snakebite mitigation and king cobra research.

7<sup>th</sup> February- RFO trainees from Telangana visited ARRS. A presentation on the research and conservation work done at ARRS and a talk about snakes, snakebite mitigation and basic first aid methods was shared with them.



8<sup>th</sup> February- Forest Department recruits from Bangalore visited ARRS to explore the conservation methods followed here. Coincidentally we also received two distress calls on the same day. It was a great field experience for them as they witnessed a king cobra and a spectacled cobra rescue. Safe handling procedures were demonstrated including the use of appropriate equipment.

16<sup>th</sup> February- ARRS was invited to conduct a two day workshop for two different batches of Forest Department officials from the Cauvery Wildlife Division and local snake rescuers. There were great interactive sessions about ARRS research and conservation work, human-snake conflict and snakebite mitigation.

24<sup>th</sup> February- BSc final year students from Kalburgi visited ARRS for an interactive session on biodiversity conservation, king cobra research and ecology and snake bite mitigation.

26<sup>th</sup> February- Forest Department recruits from Chakra visited ARRS for a talk on research and conservation work done by ARRS, snakes and snake bite mitigation.

3<sup>rd</sup> March- on the occasion of World Wildlife Day, Forest Department recruits from the Forest Training Centre, Tattihalla visited ARRS.

12<sup>th</sup> March- the Kerala Forest Department arranged for a visit of selected snake rescuers (licensed by the Kerala state) to ARRS. ARRS presented research and conservation work done there. They witnessed a few rescue operations and a demonstration on safe and ethical methods of snake rescue and onsite awareness.

### **In the News, TV/Documentary & Social media**

On 5<sup>th</sup> February, an article about ARRS conservation work was published in the Deccan Herald newspaper.

<https://www.deccanherald.com/specials/hiss-highness-the-snakes-of-agumbe-1187657.html>



During 10<sup>th</sup> to 14<sup>th</sup> May ARRS staff, volunteers and KCEC trackers assisted the Rolex team which was shooting a film as a follow up to the Rolex Award for Enterprise presented to Rom Whitaker.

Ms. Martina Anandam joined ARRS as a Research Coordinator. She will conduct research workshops under the supervision of Dakshin Foundation, with which MCBT has an MOU.

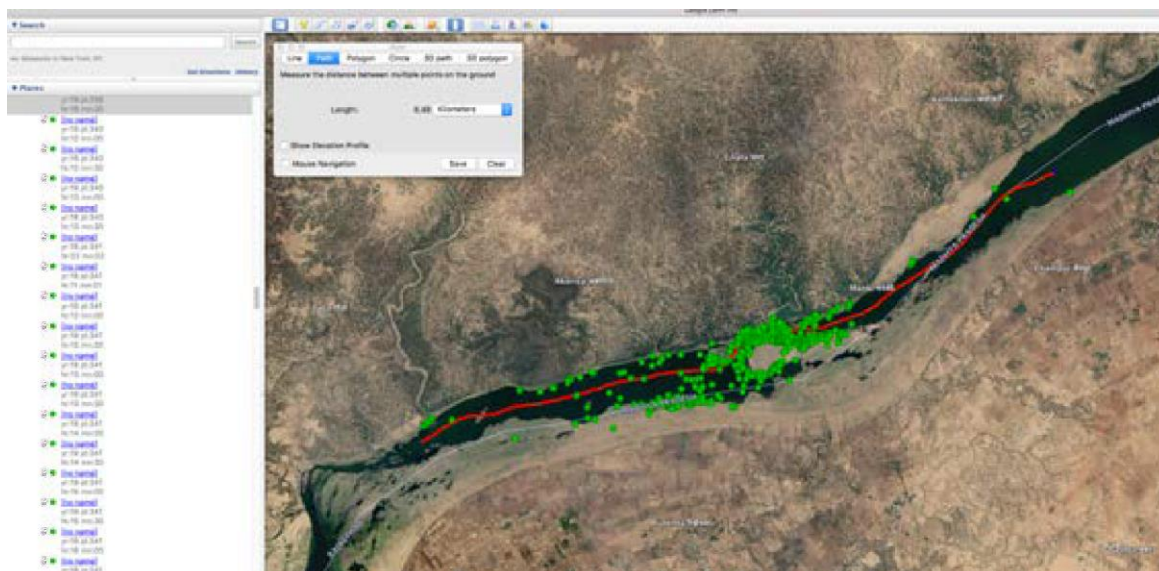
# GHARIAL ECOLOGY PROJECT

The Gharial Ecology Project (GEP) completed its 15th field season (2023), since its initiation in 2008, following the mass die-off of gharial (*Gavialis gangeticus*) in the winter of 2007-08. The GEP has three goals: 1) to develop a comprehensive assessment of gharials in the National Chambal Sanctuary (NCS), 2) to identify and protect the species' critical riverine habitats, and 3) to reduce threats and challenges to the species' continued survival. Gharials are Critically Endangered with an estimated 750-800 mature adults globally; 650+ are resident in the NCS. Project activities are conducted primarily by a small core staff (3-4) of Indian biologists / naturalists, with periodic inputs from its Senior Scientific Advisor, Professor Jeff Lang.

**Tracking gharial tagged with radios:** Altogether, 31 gharial outfitted with radio tags were monitored continuously by 3 trackers during '22 throughout the year. This routine required frequent visits to the upstream, midstream, and downstream stretches of the NCS; each stretch spans approximately 150 kms of the mainstream Chambal.

**Seasonal movement patterns:** Of the 20 gharial (tagged in 2021), 16 were from the midstream Chambal, and 4 were from the downstream. Overall, the midstream residents showed a wide variety of movement patterns than either the upstream animals studied to date, or those residing in the downstream. Characteristically, upstream gharial were predominately stationary, showing little to no movements seasonally. In strong contrast, downstream residents typically moved downstream during the monsoon, at times over moderately long distances seasonally.

**Iridium satellite GPS tracking units:** In late 2021, eight gharial were additionally outfitted with Iridium satellite GPS logging radios. The total number of adult gharials globally likely remains under 1000 today. Consequently, the NCS population constitutes about 80% of the world total. Nesting in the NCS likely exceeds 85% of the global total annually. Presently, 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 to be on the increase in recent years. However, major threats loom large, including widespread and uncontrolled water extraction, rampant riverside sand mining at many nesting sites, and ubiquitous illegal net fishing throughout the NCS.



**Outreach Activities:** In '22, GEP Outreach Coordinator spent 26 days planning, producing, and conducting various outreach programs and activities. On Mar 4th, a capacity building workshop was conducted for the MPFD at Kuno National Park, the future site for a "cheetah reintroduction" program later in 2022. Later in May, from 15th-25th, he and his assistant conducted similar programs in 5 riverside villages near the Chambal-Yamuna confluence area, near Bhareh.



**Drones deployed:** In '22, DJI quadcopter drones were used to create 2D and 3D maps of riverine habitats, using geo-referenced JPEGs. Drone imagery facilitates species identification (mugger vs. gharial), quantification of numbers present, as well as accurate estimates of animal sizes. Within large crèches, counting hatchlings accurately is possible with drone-acquired imagery. Related software has allowed 3D imagery of nesting banks for detailed analyses of nest placement, relative to water levels, and nearby nests.

**Nest surveys-Post Hatching:** In '22, 506 gharial nests were recorded by surveys immediately post-hatch, as well as during hatching at selected nest sites. This number represents an increased nesting effort of 84 nests. The largest nesting colony, on record to date, a mid-river island at Nadigoan near the upstream base, contained in total 67 nests, of which 59 hatched successfully, and 8 were predated.

**Creche counts:** In recent years, frequent counts of hatchlings visible in creches have been made until each large group of hatchlings disperses, in an attempt to document survivorship of hatchlings in the days post hatch. Generally, each creche tends to remain grouped near the nesting site as long as the water levels remains low, prior to the start of monsoon rains and riveredge flooding. Representative counts at large and small creches are available for 2022. Observations were made at 15 sites, with nest numbers ranging from 1 to 51 when counts were made. Highest number of hatchlings was 2015 at Nadigoan with 51 nests hatched, but hatchling numbers dropped to 880 less than 3 weeks later. Nest predation was highest at the sites with the most nests. Several sites with only 1-2 nests showed relatively high survivorship. The drop in hatchling numbers by the end of 4 weeks post hatching are difficult to interpret, simply as losses due to predation,



since creches tend to organically disperse and spread over greater shoreline distances, as the hatchlings grow and begin to feed regularly, while remaining loosely grouped prior to high water.



**Male transfer to Son Gharial Sanctuary:** In mid December '21, the GEP field team captured and transported a big- ghara male (4.9m=TL; ~560 kg=WT) from the lower Chambal to the Son Gharial Sanctuary by road within the MP borders, an approximate distance of ~800kms, which took 33+ hrs from capture to release. The results of this transfer were exceptional. In late February '22, courtship and mating were observed, and in late March, 4 nests were laid which subsequently hatched in late May, producing ~120 hatchlings. The creche was attended by the nesting females, accompanied by the new parent!

**Capture and tagging gharial:** The GEP field team had another successful catch and tag session on the Chambal in late 2022. A total of 35 resident wild gharial were tagged with radio transmitters, including 10 with Iridium satellite transmitting tags that convey GPS location information.

**Prague Zoo-Krokodylii Zoo visits:** In early October, Jailabdeen A. and Prof. Jeff Lang met in Prague, traveled to Pisek, visited the Plzen Zoo, then participated in the European Crocodile Network Meeting 2022 in Protivin on 8-9 Oct at the Krokodylii Zoo, then returned to the Prague Zoo where they stayed from 10th-14th Oct. On 11th Oct, they gave talks during Gharial Day, hosted by the PZ and the Czech Herp. Society, and later attended tours and talks with Plzen Zoo staff.

**Gharial genetics:** Final data analyses and preliminary write ups of the two genetic studies of Chambal gharial were completed in '22, with periodic visits to our collaborators at LaCONES, a satellite facility of the Centre for Cellular & Molecular Biology (CCMB) in Hyderabad. With a new panel of markers, a genetic bottleneck event in the Chambal population is clearly evident. Furthermore, detailed parentage analyses show evidence of multiple paternity, within nests as well as within nesting sites. This suggests that multiple males are fathering nests in nest colonies, and that females from different breeding sites are nesting together.

**Gharial communication:** Jailabdeen A. has continued his PhD research studies of acoustic signaling amongst "big ghara" males. He is also investigating chemical signaling via secretions produced in the gular and cloacal glands. Pheromone samples from wild gharial of various sizes, ages, and sexes have yielded complex mixtures of distinctive chemical compounds.

**International Funding:** GEP is very grateful for 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 (June 2021) at Zoo Tampa provided additional support for the Gharial Ecology Project, and made gharial conservation on the Chambal an on-going joint venture and a distinct reality. The international zoo network continues to contribute support via the CrocFest events, as well as direct support; Berlin Zoo, Montgomery Zoo (Alabama), and the Los Angeles County Zoo have provided substantial funding in the past two years. We have begun to garner CSR funding from Indian industry, and gratefully acknowledge the extraordinary logistic and operational funding provided by the Astral Pipes Foundation, as we solicit additional CSR support.



## AWARDS FOR OUR IRULAR PARTNERS



Mr. Masi and Mr. Vadivel of the Irular community received the Padma Shri award on April 22<sup>nd</sup> at the Rashtrapati Bhavan in Delhi. The ceremony was a grand event attended by dignitaries, officials, and awardees from across the country. It is inspiring to see members of the Irular community being recognized for their efforts in conservation and preserving the environment. Snake catching is a crucial skill that requires knowledge and expertise, and the Irular community has a long tradition of using this knowledge.

## MCBT AWARDS AND RECOGNITION

Curator Nikhil Whitaker received his PhD degree on the mugger crocodile in October. This will be an added fillip to Croc Bank's research aspirations as students will be able to work under him on reptile related topics.



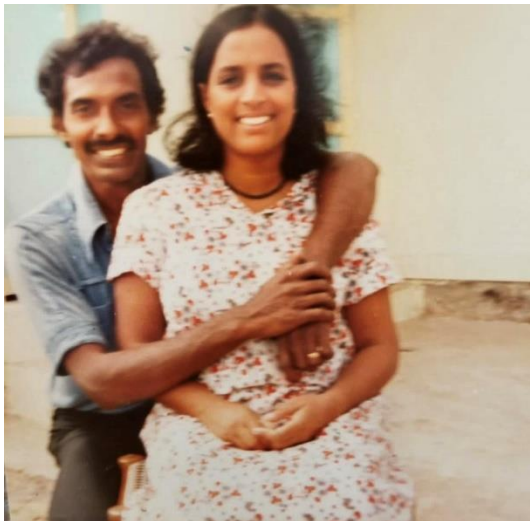
Ganeswar Ch, Snake Conservation and Snakebite Mitigation Coordinator, was made the Co-Chair of the Snakebite Task Force of IUCN. His Poster Presentation won the prize, at the International Society for Toxinology Conference at Abu Dhabi. He also won the Best Photo award at Oxford's Venom Conference in the UK

Our Education Officer Steffi John has been selected as the Regional Representative for South Asia by the International Zoo Educators Association.





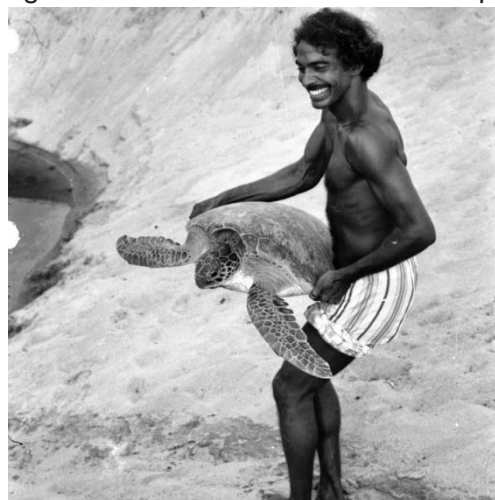
## OBITUARY



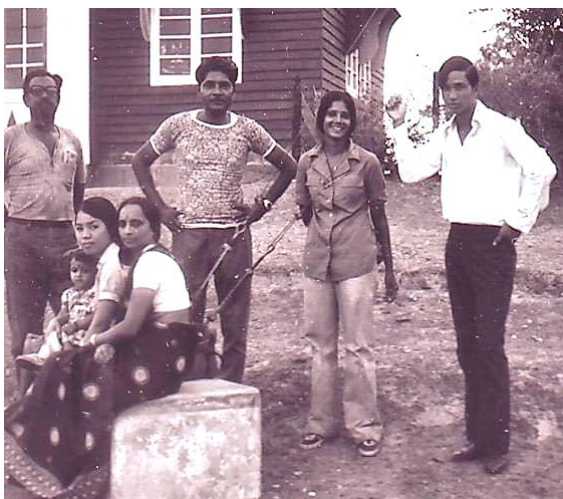
**Brenda Bhaskar**, one of the members of the initial Croc Bank team, passed away on October 25<sup>th</sup> 2022. She was a wonderful colleague, first at the Snake Park and then at the Croc Bank. Married to the sea turtle biologist Satish Bhaskar, she was a cheerful, forever-smiling friend to all of us.

**Satish Bhaskar**, one of India's pioneer conservationists was laid to rest on 22<sup>nd</sup> March, 2023 just five months after his wife. He carried out the first coastal surveys for our sea turtles, for the Madras Snake Park, Madras Crocodile Bank, and WWF. His mode of transport was mostly his sturdy legs and his feats include a close elephant

encounter on Interview Island, Andamans, marooning himself for a 5-month sea turtle study on uninhabited Suheli Island, Lakshadweep, and walking literally thousands of kilometers of India's coastline looking for nests and interviewing local communities on the status of these amazing animals. Shy and humble, Satish was not in the game for fame or name, but simply because he was passionate about marine conservation, and the job had to be done. Brenda received a "letter in a bottle" from him from Suheli Island, posted to her by a Sri Lankan fisherman. Typically, Satish had enclosed the postage money as well.



So the two of them are together again, in the happy hunting grounds where the exceptional people go. But their legacy will remain firmly here on Earth and the Croc Bank thanks them for their passion and involvement in this organisation and its work. Rest in Peace, Brenda and Satish.



**Allen Vaughan** (right) passed away on 5<sup>th</sup> March 2023 in Port Blair. Allen was the first Manager of the Croc Bank and shared many adventures with us here and in the Andamans.

Zai Whitaker made the first contact with Allen Vaughan and members of his family on her croc survey trip in 1975. RIP Allen and thank you.

## NEWS CLIPS 2022-2023

<https://www.sentinelassam.com/north-east-india-news/assam-news/video-on-snake-bites-in-northeast-to-be-released-at-the-national-level-585459/1st> April, 2022

<https://www.thenewsminute.com/article/meet-kaali-chennai-snake-tracker-and-record-keeper-of-all-things-serpentine-162834/12th> April, 2022

<https://timesofindia.indiatimes.com/life-style/spotlight/when-kids-turned-zookeepers-at-the-crocodile-bank/articleshow/90904369.cms/18th> April, 2022

<https://www.thehindu.com/sci-tech/science/world-veterinary-day-join-these-doctors-in-india-who-save-lives-in-the-wild/article65356116.ece/29th>, April 2022

<https://www.devdiscourse.com/article/science-environment/2058608-new-colorful-species-of-leopard-geckos-identified-in-odisha-ap/02.06.2022>

<https://news.abplive.com/science/new-leopard-gecko-species-identified-in-forests-of-andhra-and-odisha-1535698/> 5<sup>th</sup> June, 2022

<http://www.sci-news.com/biology/eublepharis-pictus-10874.html/June> 6th 2022

<https://www.sciencedaily.com/releases/2022/06/220601111757.htm/June> 6th, 2022

<https://www.outlookindia.com/national/new-colourful-species-of-leopard-geckos-identified-in-odisha-ap-news-199876/9th> June 2022

<https://indianexpress.com/article/explained/gecko-found-andhra-odisha-turns-out-new-species-7949916/Thursday>, June 09, 2022

<https://timesofindia.indiatimes.com/city/chennai/pil-seeks-to-stop-transfer-of-1k-crocs-from-chennai-park/articleshow/92292741.cms> Jun 18, 2022, 08:33 IST

<https://www.outlookindia.com/travel/agumbe-cherrapunji-of-the-south-news-20452025.06.22>

<https://www.thehindu.com/news/cities/chennai/ensure-availability-of-anti-rabies-vaccine-anti-snake-venom-in-phcs-dph/article65590614.ece> 01.03.22

<https://timesofindia.indiatimes.com/city/chennai/350-crocodiles-from-city-reach-gujarat/articleshow/92507029.cms> June 28 2022 02.07.22

<https://timesofindia.indiatimes.com/city/chennai/tn-health-dept-asks-phcs-to-keep-adequate-stock-of-rabies-vaccine-and-snake-antivenom/articleshow/92616361.cms> 02.07.22

<https://www.thehindu.com/news/national/tamil-nadu/madras-crocodile-bank-trust-defends-decision-to-shift-1000-crocodiles-to-gujarat/article65592110.ece> 03.07.22

<https://www.thehindu.com/news/cities/chennai/watch-madras-crocodile-bank-trust-defends-decision-to-shift-1000-crocodiles-to-gujarat/article65612320.ece> 7th July 2022

<https://www.news18.com/news/lifestyle/5-must-do-adventure-activities-in-tamil-nadu-that->



[will-get-your-heart-racing-5622277.html](#) 25th July 2022

<https://www.thehindu.com/news/national/tamil-nadu/madras-hc-dismisses-case-against-transferring-1000-crocodiles-from-chennai-to-gujarat/article65752934.ece> August 10th 2022

<https://indianexpress.com/article/cities/chennai/madras-hc-upholds-transfer-of-1000-crocodiles-to-gujarat-zoo-8083642/> August 11<sup>th</sup> 2022

<https://www.livewlaw.in/news-updates/madras-high-court-dismisses-pil-challenging-transfer-of-1000-crocodiles-to-gujarat-206364> 12th August 2022

<https://www.dtnext.in/city/2022/08/16/1000-crocodiles-from-chennai-to-be-relocated-to-gujarat-soon> 16th August 2022

<https://www.latestly.com/socially/india/news/the-madrashighcourt-on-wednesday-dismissed-a-public-interest-litigation-against-the-latest-tweet-by-ians-india-4066536.html> 17th August 2022

<https://indianexpress.com/article/express-sunday-eye/teachers-day-special-romulus-whitaker-learning-nature-favourite-teacher-8129309/>  
<https://indianexpress.com/article/express-sunday-eye/teachers-day-special-romulus-whitaker-learning-nature-favourite-teacher-8129309/h> September, 2022

<https://www.hindustantimes.com/lifestyle/art-culture/i-want-to-include-every-detail-romulus-whitaker-on-his-upcoming-autobiography-101667034182870.html> 29th October, 2022

<https://www.thehindu.com/life-and-style/madras-crocodile-bank-takes-the-vr-route-to-education/article66076389.ece> 2nd November 2022

<https://www.thehindu.com/sci-tech/energy-and-environment/indian-zoos-seeds-of-wildlife-conservation/article66106532.ece> 2nd December 2022

<https://www.bbc.com/news/world-asia-india-63740095> 3rd December 2022

<https://chennaivision.com/members-of-the-inner-wheel-club-of-chennai-verve-adopted-the-entire-turtle-enclosure-at-the-madras-crocodile-bank/7th-December-2022>

<https://timesofindia.indiatimes.com/city/chennai/ally-the-superstar-at-madras-crocodile-bank-dead/articleshow/96608126.cms> 30th December 2022

<https://www.thehindu.com/news/national/tamil-nadu/bravehearts-vadivel-and-sadaiyan-shine-a-light-for-irula-cooperative/article66464742.ece> 3rd February, 2023

<https://www.deccanherald.com/specials/hiss-highness-the-snakes-of-agumbe-1187657.html> 3rd February, 2023

<https://letabaherald.co.za/123228/hoedspruit-reptile-centre-hosts-africa-conference/4th-February-2023>

<https://www.thehindu.com/news/national/tamil-nadu/governor-stresses-on-due-recognition-for-irulas-snake-catching-vocation/article66572939.ece> 2nd March 2023

## SCIENTIFIC PAPERS 2022 – 2023

1. Gour, R., N. Whitaker & A. Kartik 2022. Status and distribution of Mugger Crocodile *Crocodylus palustris* in the southern stretch of river Cauvery in Melagiris, India. Journal of Threatened Taxa 14(3): 20733–20739. <https://doi.org/10.11609/jot.7575.14.3.20733-20739>.
2. Whitaker, N., & C. Sivaraman. 2022. Behaviour in a captive family group of Siamese Crocodiles (*Crocodylus siamensis*) at the Madras Crocodile Bank Trust near Chennai, India. Reptiles & Amphibian 29(1), 71–75. <https://doi.org/10.17161/randa.v29i1.16247>.
3. [Grzimek's Animal Life Encyclopeida\\_gharial.pdf](#) Volume 7; Reptiles Romulus E. Whitaker and Nikhil Whitaker Second edition 2003
4. Multifaceted community health education programs as powerful tools to mitigate snake-bite - <https://pubmed.ncbi.nlm.nih.gov/36632238/>
5. RSTMH Article - <https://www.rstmh.org/news-blog/blogs/shared-landscapesdivided-lands>
6. Greenpeace article - <https://www.greenpeace.org/india/en/story/14641/reptile-awareness-day-the-beauty-in-the-beasts/>
7. Human-Wildlife Conflict Conference talk - <https://www.hwctf.org/conference-vid-eos?pgid=lqvzh4l6-70701f82-35eb-447e-a51a-9eba671b9e45>

## INCOME AND EXPENDITURE STATEMENT 2022-2023

### Income

Ticket Sales	2,99,20,050
Research Grants	<b>1,75,67,656</b>
Donations & Rent	<b>14,52,597</b>
Environment Education	<b>16,18,501</b>
Adopt an Animal	16,64,988
Bank Interest	<b>40,74,866</b>
Croc Shop sales	14,42,743
Other income	<b>2,63,79,725</b>
ARRS	<b>5,82,978</b>
<b>Total</b>	<b>8,47,04,104</b>

### Expenses

Salary and Wages	<b>1,69,54,079</b>
Reptile Feed Costs	<b>25,20,150</b>
Maintenance and Upkeep	81,52,374
Research	1,19,86,194
Environmental Education Expenses	13,88,280
ARRS	26,65,090
Croc Shop Expenses	12,41,724
Administrative Expenses	17,64,805
Capital Assets	<b>63,58,018</b>
<b>Total</b>	<b>5,30,30,714</b>

## VISITATION - 2022-2023

<b>Sl.No</b>	<b>Month</b>	<b>Total no of visitors</b>
1	April 2022	23,605
2	May 2022	33,197
3	June 2022	27,300
4	July 2022	24,160
5	August 2022	27,594
6	September 2022	20,844
7	October 2022	36,494
8	November 2022	17,442
9	December 2022	37,843
10	January 2023	40,571
11	February 2023	23,167
12	March 2023	22,735
	<b>Total</b>	<b>3,34,952</b>



## DONOR LIST 2022-2023

<b>Organisation</b>	<b>Project</b>	<b>Amt (Rs)</b>
Ford Motors Pvt Ltd	Virtual Zoo program	8,00,000
Astral foundation	Gharial Ecological Project	15,00,000
The Habitats Trust	Gharial Ecological Project	5,00,000
Arvind Vithal Gandhi Foundation (USV)	Reptile feeding	24,00,000
Coromandel International ltd	Implementation of MCBT Projects	1,00,00,000
Kamini Sundaram	General Donation	2,00,000
Venu Srinivasan	Master plan development	2,50,00,000
King Cobra Conservancy (KCC)	ARRS Maintenance	4,32,650
Prague zoo	Gharial Ecological Project	14,78,422
UK Online Giving Foundation	Snakebite mitigation	1,84,945
King cobra Conservancy (KCC)	Snakebite mitigation	1,59,674
Stichting Herpetofauna Foundation	General donation	52,116
People for Wildlife	HWC SG Conference fund	54,650
Save the Snakes Corporation	HWC SG Conference fund	76,300
M M Muthiah Research Foundation	Job experience at Zoo Brno - Sponsorship	50,000

## AFFILIATED INSTITUTIONS

(Committees/ Membership/ Collaboration/ Consultation/ Editorial/  
Networking)International Union for the Conservation of Nature (IUCN)

1. ANET (Andaman and Nicobar Environment Team)
2. Andaman & Nicobar Coastal Zone Management Authority
3. Andaman's Science Association, Port Blair
4. Andaman & Nicobar Islands Monitoring Committee for the Working Plan for the South Andaman Division
5. Andaman & Nicobar Islands State Level Environmental Council, Port Blair
6. Andaman & Nicobar Islands State Wildlife Board, Port Blair
7. Ashoka Innovators for the Public, New Delhi
8. Auroville Index Seminum, Tamil Nadu
9. Central Zoo Authority of India, New Delhi
10. Centre for Cellular and Molecular Biology, Hyderabad
11. Centre for Environment Education, Ahmedabad
12. Chennai Snake Park Trust
13. Chicago Herpetological Society, USA
14. Coral Reef Monitoring Network- South East Asia
15. Dakshin Foundation, Bangalore
16. Development Alternatives, New Delhi
17. Fauna and Flora International, UK
18. Irular Tribal Women's Welfare Society, Chennai
19. Irular Snake Catcher's Cooperative Society, Chennai
20. International Association of Zoo Educators, UK
21. Jersey Wildlife Preservation Trust, UK
22. Turtle Survival Alliance
23. IUCN/SSC Crocodile Specialist Group
24. IUCN/SSC Tortoise and FWT Specialist Group
25. IUCN/SSC Marine Turtle Specialist Group
26. IUCN/SSC Indian Subcontinent Reptile & Amphibian Group
27. IUCN/SSC Captive Breeding Specialist Group
28. IUCN/SSC Sustainable Use of Wild Species Group
29. Kalpavriksh, Pune

30. Madras Veterinary College, Chennai
31. Madurai Kamaraj University, Madurai
32. National Centre for Biological Sciences, Bangalore
33. Nilgiri Wildlife Association, Ootacamund
34. Pondicherry University, Pondicherry
35. Salim Ali Centre for Ornithology & Natural History, Coimbatore
36. Smithsonian Institution, USA
37. Marine Conservation Society, U K.
38. Society for the Andaman & Nicobar Ecology, Port Blair
39. Sri Lanka Dakshin Foundation, Bangalore, Karnataka
40. Survival International, UK
41. The Indian People's Tribunal on Environment & Human Rights, Mumbai
42. The Wildlife Trust of India, New Delhi
43. Trust for Environmental Education (TREE), Chennai
44. Zoo Outreach Organization, Coimbatore
45. UNEP/Conservation for Migratory Species of Wild Animals, Germany
46. World Congress of Herpetology
47. World Wide Fund for Nature (WWF) - India & International Wildlife Institute of India,  
Dehradun
48. Bombay Natural History Society, Mumbai

## INDIAN SNAKEBITE INITIATIVE NETWORK

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- Tamil Nadu
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