NOVEMBER - DECEMBER 2021 | Volume: 05 No: 04 | RS. 200/=

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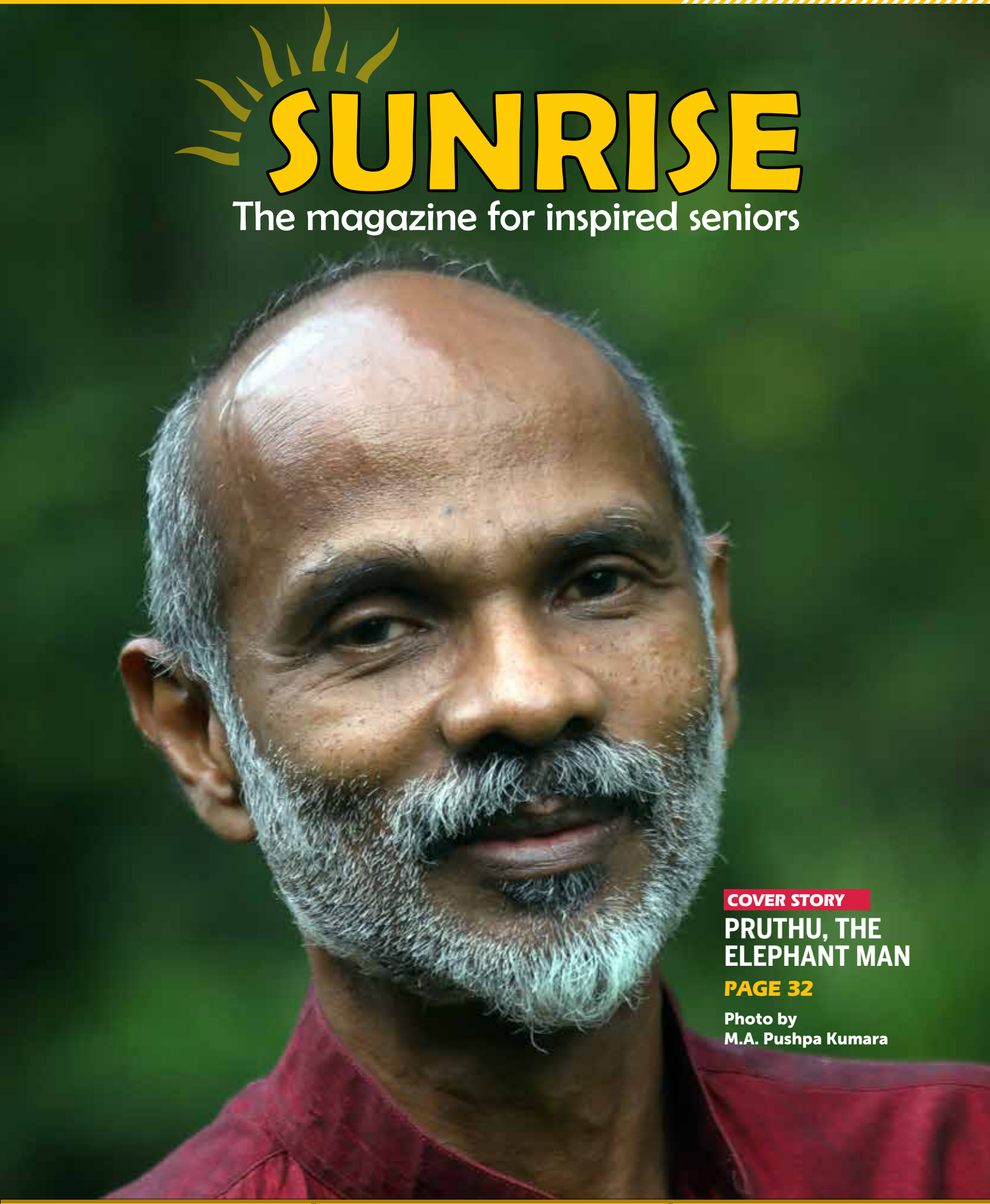

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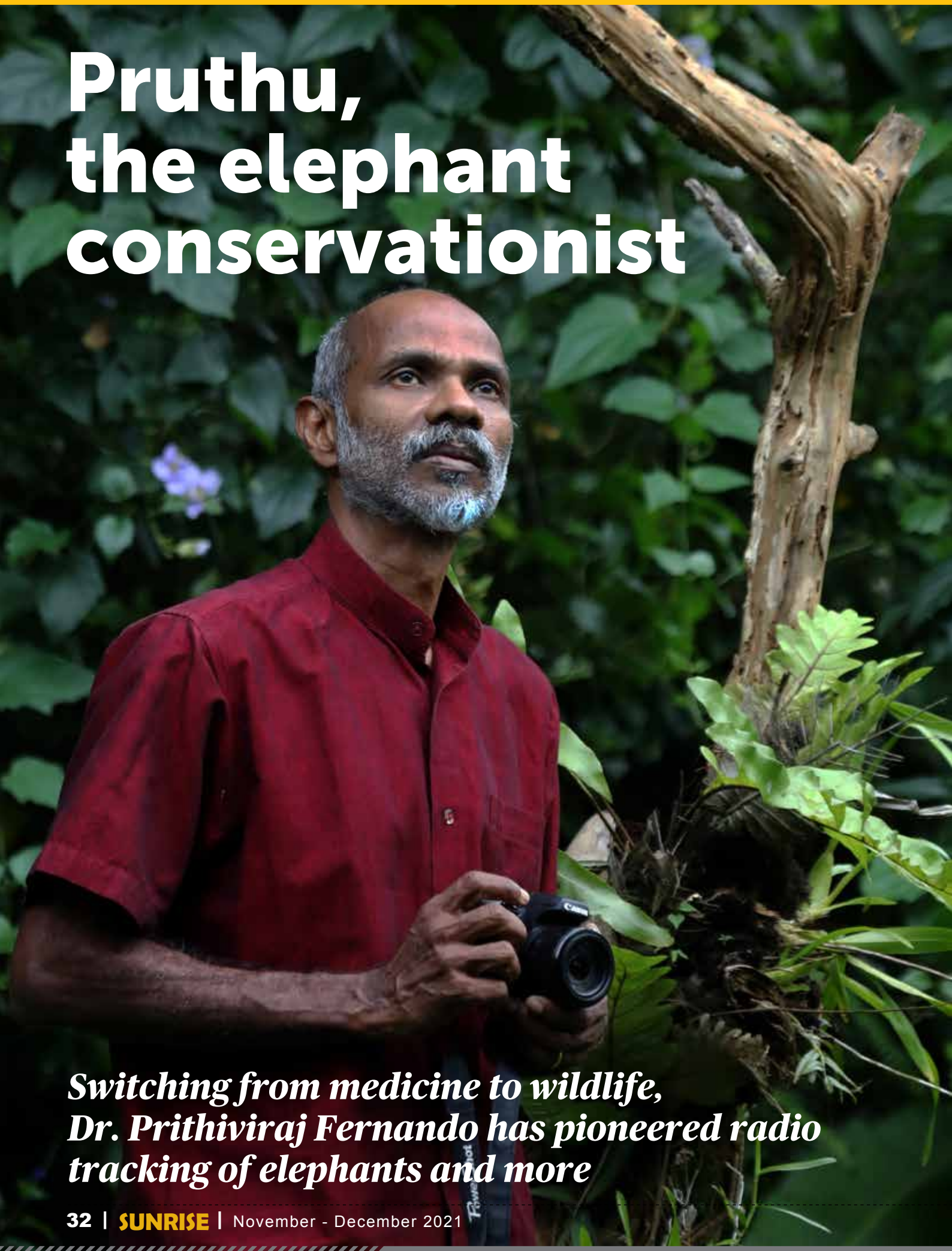


Switching from medicine to wildlife, Dr. Prithiviraj Fernando has pioneered radio tracking of elephants and more

By **Kumudini Hettiarachchi**

Perennial has been the human elephant conflict (HEC) in Sri Lanka but in some remote hamlets in the crisis-ridden North Western Province, there is a win-win situation for both humans and elephants.

The permanent electric fences are not hemming in the wild elephants but are around the hamlets, while temporary fences surround paddy fields before the harvest is gathered and then dismantled. These measures have enabled humans to keep their lives and livelihood safe and the elephants to enjoy whatever is discarded after the yield has been taken away, without facing the wrath of the villagers.

The doer behind this concept and lots of scientific research – based on individually identifying many hundreds of majestic elephants in and outside national parks is Dr. Prithiviraj Fernando, fondly called Pruthu.

Dr. Fernando is not only a Ph.D holder but also a medical doctor, the defining moment coming just before he secured his MBBS (Bachelor of Medicine, Bachelor of Surgery) qualification.

Meeting him on many occasions at his home or in the field, an unforgettable moment has been getting close, oh so close, in Galgamuwa to a large female herd being visited by a massive tusker which also included seven tuskers of different ages.

This time, we meet Pruthu in his charming and uncluttered temporary home painted green in Homagama, in an area replete with large trees with the stillness broken only by bird-calls or the sudden gallop on the roof by monkeys. With the barest of furniture, what catches the eye are a few elephant ornaments and beautiful paintings of birds by Pruthu, the painter.

The permanent home now of Pruthu and wife,

The female herd (above) to which a magnificent tusker comes a-visiting (below) at Palukadawala in Galgamuwa. The writer got very close to this herd with Pruthu and Jenny

Inseparable are Pruthu and his jeep, photographed at Tissamaharama (2012)

Jenny, who is equally passionate about wild elephants, is in Tissamaharama, way down south.

Childhood for Pruthu who will step into his 60s next February was in Negombo with teacher-parents, J.M.E. and Clotilda Fernando, and one sibling, older sister Priyanthi. It was his Dad's hometown and Pruthu attended St. Mary's College, where his Dad taught, up to Grade 4, while his Mum taught at Holy Cross College, Gampaha. When the family moved

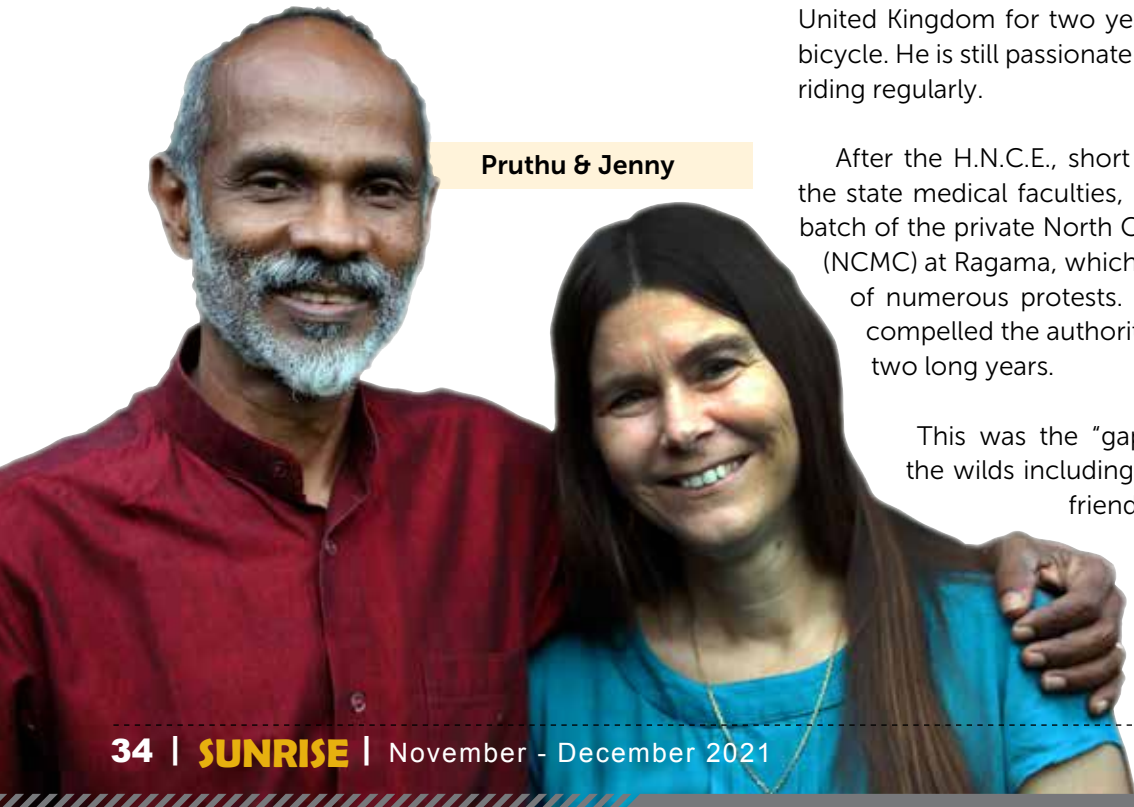


Family: Siblings Pruthu and Priyanthi (1965); Portrait of four – Dad J.M.E. Fernando, Mum Clotilda, Priyanthi and Pruthu (1968); and Graduation – Pruthu with Dad and Mum (1991)

to Gampaha, Pruthu attended the Miriswatte Central College for one year before sitting the All Island Entrance examination to enter popular schools, which sent him through the portals of Royal College, Colombo, into Grade 6. Subsequently, they moved to Colombo and his sister joined Visakha Vidyalaya.

Those were the days of the N.C.G.E. (National Certificate in General Education) and H.N.C.E. (Higher National Certificate of Education) examinations instead of the Ordinary Level and Advanced Level exams.

"No I didn't have many pets and we never went to national parks," says Pruthu, but his parents did take him quite often to the Dehiwela Zoo to spend the day and it was here that the budding artist in him took root.



Pruthu & Jenny

Doodling he had done since he was a little boy and he recalls winning an art competition held by a newspaper as a "tiny kid". One day at the zoo, while sketching to his heart's content, someone had peered down, taken a look and suggested that he join the Young Zoologists' Association (YZA). It was the Director of the Zoo, Lyn de Alwis and so began Pruthu's attendance at YZA meetings.

He was a quiet boy in class and smiles as he reminisces that when Mum met his class teacher Mrs. Udugampola, she would tell her that he was like Nero who played the fiddle while Rome went up in flames.

The college years passed by with Pruthu drawn towards the science stream because he liked biology. He did "some" sports, a little bit of athletics and set up the Cycling Club of Royal after Mum who was in the United Kingdom for two years brought him a racing bicycle. He is still passionate about cycling and enjoys riding regularly.

After the H.N.C.E., short of a few marks to enter the state medical faculties, he went into the second batch of the private North Colombo Medical College (NCMC) at Ragama, which was at the receiving end of numerous protests. In the final year, trouble compelled the authorities to shut the NCMC for two long years.

This was the "gap" when Pruthu roamed the wilds including Sinharaja with a gang of friends, hiking and sketching, while pondering on his incline towards research rather than practising medicine. Medicine had been

Pruthu, a keen cyclist

what Mum yearned for him to do.

"When I looked around for research opportunities in medicine, there was limited scope. Cutting-edge research was not possible in Sri Lanka," says Pruthu, and the "break" from the lectures made up his mind for him.....to switch to research in wildlife, with his parents bowing to his wishes.

He, however, did sit the final MBBS in 1991, passing out as a doctor after eight years of study marred by countrywide protests at the time and then applied to a university in America to pursue his dream. Arguing that he had a 'double degree' (in surgery and medicine), Pruthu had pushed for a doctorate bypassing a Master's, gaining entry to both the Washington University and the University of Oregon. He chose the latter "because it was less cold in Oregon" and thought of conducting research on birds or amphibians, without a clear idea of what career pathway to follow.

It was while on rotation that he came under the powerful influence of "extremely famous" Prof. Russ Lande, an evolutionary biologist and theoretical geneticist who was "like a god" in his field.

Pruthu's background could relate easily to all the technical stuff and he looked at elephants "completely by chance". He had a long chat with Prof. Lande who agreed to be his supervisor. Pruthu wanted to study the ecology and conservation of elephants, which was not the area of expertise of Prof. Lande, but he had assured him that he would guide Pruthu in broad outlines (suggesting a focus on genetics, in addition to conservation), which allowed him "to do my own thing" and in the long run turned out "pretty well".

The process was that after two years of work at the University of Oregon, there was a qualifying examination, the success of which led to the thesis. Failure meant being kicked out of the programme with a Master's degree. Pruthu sat the exam after just one year and passed – but requested that he be given a Master's as it would help when he went back for fieldwork to Sri Lanka. Something no one else had

The 'green' Oscar

Dr. Prithiviraj Fernando receiving the award from Princess Anne

Dr. Prithiviraj Fernando has been honoured with the 'Whitley Award', a top grassroots nature conservation prize for the development of 'seasonal community-based paddy field electric fencing'.

The award "recognizing his efforts to protect wild Asian elephants by better balancing their need to range outside of tight 'protected zones' with the needs of paddy farmers whose lives can be devastated by a single crop raid" was presented by Britain's Princess Anne at the Royal Geographical Society in London in May 2009, before an audience of 400 distinguished guests including leading environmentalists.

Commenting on Dr. Fernando's success, Edward Whitley who founded the Whitley Fund for Nature (WFN) and chaired the judging panel said: "The aim of the Whitley Awards is to find and support conservation scientists whose vision, passion, determination and qualities of leadership mean they are achieving inspirational results in conservation. They are helping to build a future where nature and people co-exist in a way that benefits both. In Pruthu's case, we were especially impressed that his project is using an innovative science-backed approach to explore new ways for elephants and people to live together."

Pruthu on the left collaring an elephant (2006)

Pruthu and Janaka tracking elephants (2007)

asked before! Put to the university's Senate, Pruthu had been granted his wish and came back with his MS in Biology to conduct fieldwork for his Ph.D.

By that time, the early 1990s, one of the first studies had been done on the genetics of African elephants based on skin samples obtained with a dart gun. So Pruthu studied this technique, discussing with then Director of Wildlife Conservation, Prof. Sarath Kotagama the feasibility of using a bow and arrows for him to collect skin samples from wild elephants. Having also established strong links with Dr. Rudy Rudran of the Smithsonian Institution, Pruthu was able to head to China for two months, to do a field course in wildlife conservation.

After that he arrived in Sri Lanka armed with a bow and specially made arrows to obtain skin samples from wild elephants, but it was not meant to be.

Kotagama had resigned as Director – in a storm over the tragic death of wild elephants after British aristocrat Mark Shand (brother of Camilla, the Duchess of Cornwall now married to Prince Charles) had wished to see captures using the traditional noose.

Pruthu 'triangulating' and then roughly locating an elephant within the intersection (2007)

Tracking elephants at Yapahuwa (2009)

Dexie, a collared elephant at Yala (2014)

Pruthu very close to Madhumali, a collared elephant at Mattala (2014)

Looking back, Pruthu says that the noosing itself organised by the wildlife authorities had gone off without incident but when the four young elephants were released into the wild, the length of rope of the noose had been cut but not the noose. With the noose eating into the flesh of their legs and rotting causing massive infection, the animals had suffered an agonised death.

Now there was a new Director of Wildlife and in the background of the preceding fiasco, there was no way he would allow Pruthu to 'target' wild elephants with arrowheads shot from a compound bow!

At this point Prof. Charles Santiapillai had suggested using elephant droppings to assess genetics. So Pruthu decided to try that, collecting dung and blood samples from the same elephants in Pinnawala and going back to the genetics lab in Oregon to see whether the same results could be obtained from dung as from blood samples.

Performing tests back at the University of Oregon, Pruthu tried various methods to extract DNA from dung.

"I perfected the art of using dung to get DNA," he says simply, continuing to develop the technique with samples collected from the Oregon Zoo and establishing that dung extracted DNA gave the same results as blood extracted DNA. This would be a great tool, as getting blood samples from wild animals posed much difficulty.

Back he came to Sri Lanka in 1993 for fieldwork and recalls how with funds in short supply, what came in handy were his savings from art exhibitions. The first had been a joint exhibition while at the NCMC in 1982, with friend Jayaindra Fernando's trees and Pruthu's birds.

Three more exhibitions, one at the Lionel Wendt and two at the Art Gallery followed, mostly of birds, butterflies and some of landscapes, which funded his fieldwork and also his jeep for rugged use in the field.

Sadly, his parents passed away in 1994.

In addition to collecting dung samples for genetic assessment, his fieldwork included studying the behaviour and ecology of elephants. This he did

Pruthu puts the final touches before an exhibition

Pruthu's vivid paintings – the Yellow-eared Bulbul and the Yellow-fronted Barbet

under the UN's Global Environment Facility (GEF) Programme, discussing it with Project Director Dr. Panwar and coordinating with the Department of Wildlife Conservation (DWC) to introduce radio collaring of wild elephants for the first time in Sri Lanka with the help of India's Ajay Desai.

A comfortable perch for this bird, while Pruthu focuses elsewhere, in the wilds of India (2011)

It was at Yala that Dr. Kuruwita and the DWC along with Ajay and Pruthu tranquillised and collared the initial five elephants and then set about tracking them.

Another change of heads at the DWC put a stop to his efforts as the new head refused to allow 'outsiders' to track elephants. So now there were five elephants walking around with radio collars and no one tracking them. This led to a battle of wits and ended up by Pruthu appealing to the ministry and intimating that he would be compelled to take legal action as he had invested time and funds and collaring elephants and not tracking them was irresponsible. Finally, the ministry secretary had intervened and Pruthu was allowed to track and collect data again.

Jenny, Pruthu, Priyanthi and Ajith at Bundala (2020)

Jenny and Pruthu at Small Adams's Peak, Ella (2017)

Arduous was the task, he says, for unlike the GPS (Global Positioning System) equipment now available, this was VHF (Very High Frequency), which simply gave out a radio signal, which had to be tracked. Tracking was no easy task but very enjoyable too – hauling equipment like a TV antenna, sometimes they had to walk miles and miles listening to the beeps. If the signal was getting louder and clearer, it meant he was closing in on the collared elephant. If no beeps could be heard, he and the team had to catch the signal by climbing high hills that rose out of the forest canopy. Thereafter, meticulously marking the location and signal direction on a map, he would triangulate and then within the intersection roughly locate the elephant.

Tiring and tedious it was, producing only a few points per month after "lots" of tracking, while also collecting observational data by locating the elephants on the ground. He also worked in the HEC hotspot of the northwest. Here trial-and-error measures such as ditches to stop the elephant crop raiders; communal

Pruthu and Jenny taking a breather at Horton Plains (2019)

Pygmy elephants

Following his pet passion of elephants, it was also while he was at Columbia that Pruthu carried out one of the first range-wide genetic studies of wild Asian elephants.

Pruthu was also able to solve the mystery of the pygmy elephants of Borneo, a large island separated from mainland Asia by the South China Sea. Debate had surrounded the origins of these 'little' giants, with wide belief that they were the descendants of a pair gifted by the Dutch East India Company to the Sultan of Sulu, who ruled over the area in the 18th century. (The Sultanate of Sulu was an Islamic state that ruled the islands in the Sulu Archipelago, parts of Mindanao, today's Philippines, certain portions of Palawan and north-eastern Borneo). As they were considered feral, they were given low conservation priority.

Analyses done by Pruthu had brought to light scientific evidence that the elephants walked into Borneo when it was linked to continental Asia during the last Ice Age and that they had been evolving independently of their relatives in other areas.

Even though originally, Sri Lankan palaeontologist P.E.P. Deraniyagala had identified these elephants as a distinct subspecies, they were later disregarded as feral. Confirmation that they were 'indigenous' to Borneo had come with Pruthu's genetic studies, which validated the strong need to conserve them.

paddy storage areas; or stringing up cassette tapes around paddy fields to scare away the elephants were piloted and tested.

Pruthu has had a few close calls but he says that even though he loves wild elephants he has always been conscious that they are potentially dangerous wild animals and need to be treated with respect and not taken lightly.

Back at the laboratory at Oregon, Pruthu set about extracting mitochondrial DNA from the samples he had collected, running them through amplification machines to read the genetic coding. In the first years of his study, the only way to read the coding was with radioactive labels and exposing X-ray films and there were many lab jokes about "glowing in the dark", he says. He collected a fair amount of data, using this technique, when fluorescent dye labelling and reading the code with automated machines came on the scene.

"This gave fantastically good results," and was comparatively much easier. However, it also showed up the mistakes of the technique using radiation and he decided to throw out all the data from the radioactive work and start afresh.

Pruthu graduated from the University of Oregon with a PhD in 1998 and his thesis was titled 'Genetics, ecology and conservation of the Asian elephant'. Doctorate in hand, Pruthu was offered a job as a post doc at the Center for Environmental Research and Conservation (CERC) at Columbia University, New York under the mentorship of environmental biology giant, Prof. Don Melnick.

It had been Melnick who brought together an "extraordinary consortium" with partners such as the American Museum of Natural History, the New York Botanical Garden, the Wildlife Conservation Society and the Wildlife Trust in a quest to study and preserve the living world and expand research and education in conservation at Columbia University and around the world. Although Melnick who passed away in 2019 was mainly a 'primatologist', he was a powerful influence on Pruthu who came under his guidance for four years.

It was here, while doing elephant and rhino work that Pruthu met Jennifer Pastorini who was a post doctoral researcher on lemur genetics at Don's lab. They married in 2007.

In 2004, Pruthu and Jenny decided to return to Sri Lanka, although that meant they would have to give up genetics. They set up the Centre for Conservation and Research (CCR) to focus on conservation in Sri Lanka. Dr. Mary Pearl, Head of the Wildlife Trust, played a big role in enabling the move back to Sri Lanka and setting up of CCR.

Back in Sri Lanka since 2005, the couple are now running CCR working closely with the farming community as well as lobbying for protection of the wild elephant with policy-makers, while engaging in

An 'Elephant Crossing' sign designed by Pruthu (2012)

The last rhino

It was while pipetting DNA at the laboratory of Columbia University, that Pruthu applied the dung technique to the Javan rhinoceros. While Javan rhinos had been widespread in Asia including prehistoric Sri Lanka, they had been nearly wiped out, leaving only about 60 of these rare animals on the isthmus of Ujung Kulon on densely populated Java.

Their unlikely saviour had come in the form of the Krakatau volcano, across a narrow strait from Ujung Kulon. Krakatau's violent explosion in 1883 wiped out the human population in Ujung Kulon and people never returned. A few Javan rhinos repopulated the isthmus, inhabiting its impenetrable canebreak forests, which became a safe haven created by a deadly natural disaster. Then in the 1980s a few surviving Javan rhinos were discovered in Vietnam.

Pruthu applied the dung DNA technique to look at them and found that they were very distinct genetically from the ones in Ujung Kulon. Unfortunately, they could not be protected from the greed of poachers, who took their toll. The last Vietnamese Javan rhino on earth was shot dead by a poacher in 2012 – just six years after Pruthu published his findings.

Talking to villages about electric fences in ..... (2012)

The nelu blooms of Horton Plains all around Pruthu (2013)

research which provides evidence-based knowledge to tackle the HEC.

In 2005, they introduced GPS radio tracking of elephants to Sri Lanka, in collaboration with the Smithsonian Institute's Dr. Peter Leimgruber. Pruthu and Jenny are also Research Associates of the Smithsonian Institution. CCR has piloted community-based fencing as an effective method to mitigate the HEC and implemented it in pilot scale in many parts of the island. Their main focus over the past decade has been to get the government to take it up and implement it on an appropriate scale. This can only be done through people-centric agencies such as the Divisional Secretariats and agricultural agencies, but making that change has been very difficult, says Pruthu.

Pruthu and Jenny are senior members of the Asian Elephant Specialist Group and have provided their expertise to many of the range countries. They continue to advise and network with students, colleagues and governments in India, Nepal, Bangladesh, Myanmar, Vietnam, Laos, Cambodia, Malaysia, Indonesia and China.

Sharing not only life but also the passion for wild elephants, Jenny is also very vocal about the need to save Sri Lanka's wild elephants from human threats. In their home in Tissa, while they have cats, dogs and fish as pets, many are the walk-in or fly-in 'pets' she photographs such as the paradise flycatcher and its babies, toads, frogs and any creature big or small that catches her fancy.

As we wind up the interview and ask him whether his battle to save the Sri Lankan wild elephant and mitigate the HEC is a lost cause, Pruthu's answer gives hope. "Sri Lanka has the best cultural and religious background for conserving Asian elephants and a great opportunity to show the world how to co-exist peacefully with elephants. Although our time is running out, we will keep fighting for the conservation of these majestic animals and trying to change HEC mitigation to one based on science – after all Rome was not built in a day."

The yeti!

Collected from extremely remote eastern Bhutan came dung samples for genetic testing……..excitement mounted for they were believed to be from the yeti or 'abominable snowman' of 'Tintin in Tibet' fame – a giant ape-like creature, figuring in South Asian folklore.

The honour of carrying out the genetic identification in Prof. Don Melnick's lab fell on none other than Pruthu and so he extracted the DNA and read the genetic print, searching and comparing sequences.

Alas, it was no yeti but a yak, laughs Pruthu.

Yaks are large domesticated wild oxen with shaggy hair, humped shoulders and large horns, used as pack animals and for milk and meat in the Himalayan region.