

Hornbill Haven

by Amitha Bachan K. H

The pre-monsoon showers caught me by surprise but this did not deter me from making my way purposefully towards what had been my lookout for the past few months. The heavy *whoosh* of the male Great Hornbill as it approached its nest led me to quicken my steps to reach my hide, located six metres off the ground behind the foliage of a tree. From there, I could watch the magnificent birds from a safe distance. It had been an exciting week as I waited anxiously for the chick to emerge. The hornbill couple had chosen a tree some 1.2 m. in diameter. The nesting hollow was formed when a branch splintered off at a height of 8.5 m.

Over the past few years, I have spent most of my waking hours in the tropical moist forests of Nelliampathy, Vazhachal and Sholayar in the Western Ghats. I conducted field studies for my PhD in the catchments forests of the Chalakudy river basin and also worked for the department of forests here. For three years, my colleagues and I have monitored the hornbills of these forests, which connect the Nelliampathy–Parambikulam jungles on the southern rim of the Palghat Gap with the Edamalay–Pooyamkuttu forests and the northern boundary of the famous Eravikulam plateau in the Anamalai Hills. These living catchments are the source of the Chalakudy River and they provided me with endless opportunity to observe the birds to which I am attracted not just because of their beauty but also their umbilical relationship with the rainforest itself. Vital cogs in rainforest wheels, the specialised feeding and nesting behaviour of



AMITHA BACHAN

Great Hornbills forage on as many as 44 species of fruiting trees, with figs constituting their main food supply in the early stages of growth of the young ones. Seeds of the nutritious *Myristica* can be seen here in the male's beak in the final stages of nesting.

hornbills makes them truly unique. Their vital role in the regeneration of these fragile rainforests cannot possibly be overstated.

THE VAZHACHAL CANVAS

The hornbills mate for life and courting starts as early as September. The courting pairs are extremely vocal – exchanging rhythmic “kock...kock” duets, especially during early mornings and late evenings. During this period, the male and female occupy the topmost branches of high canopy trees such as *Calophyllum polyanthum*. The birds make clapping sounds with their bills and the male offers regurgitated fruits to his mate.

Hornbills begin nesting in the middle of December in Vazhachal and as late as February in Sholayar. Usually, a natural hollow formed by a broken branch serves as a secure nest and our studies revealed their preference

for seven species of trees Pali *Palaquium ellipticum*, Elavu *Bombax ceiba*, Thanni *Terminalia bellirica*, Kalpayin *Dipterocarpus indicus*, Kulavu *Kingiodendron pinnatum*, Vellakil *Dysoxylum malabaricum* and Vellapayin *Vateria indica*. My colleagues and I found one nest on a Cheeni *Tetrameles nudiflora* tree in a degraded forest fragment, but these trees were only used by Malabar Pied and Grey Hornbills. Untouched old growth forests are crucial to the survival of all hornbills. In disturbed and low altitude forests such trees were only present in riparian areas. Of the 19 nests we found in our study area, 17 were in stretches that support evergreen foliage. And there were always a large number of fruit trees on hand. An interesting phenomenon was that after hatching, hornbills formed large flocks (15 to 50

individuals) to take advantage of the safety in large numbers while foraging for fruit.

Once a nesting site is chosen, both male and female go about ensuring that it is ready for the eggs to be deposited. The female enters the nest, cleans it and begins to seal the entrance using her own excreta. Only a narrow slit will be left open, through which her mate will feed her and the chicks. We never saw the birds mix mud with excreta as has been reported from other parts of the world, nor did R. Kannan, who studied hornbills in the Valparai forests in 1997. Once incarcerated in the nest, the female sheds her flight feathers and carefully throws them outside. *Kadars*, nomadic tribals endemic to this part of the Western Ghats, find hornbill nests by looking for feathers and excreta (carefully ejected by mother and chicks outside the nest!) below the nesting trees. Studies suggest that Great Hornbills lay two to three eggs at a time with a clutch success of one or two. All but one nest we observed had just one chick.

In 2004, our first year, we located as many as 23 nests in the Vazhachal Forest Division and later we found 10 more. Most were in the evergreen rainforests of Sholayar, some in the riparian belts of Vazhachal and Orukombankutty. In the Vazhachal area, we found three Great Hornbill nests in a two-kilometre stretch at 200 m. altitudes from sea level. This could be one of the last remaining low altitude riparian evergreen forests in the Western Ghats and is the only place on the planet where you can see all four species of hornbills — the Great, Malabar Pied, Malabar Grey and Common Grey. The Malabar Pied is no less threatened and we were delighted to locate five nests in the two kilometre Vazhachal forest. But we found not one nest anywhere else in the entire basin. There are all too few reports on this endemic hornbill from elsewhere in the Western Ghats. It defies logic and decency therefore to learn that it is this very riparian forest of Vazhachal that so-called developers wish to submerge under the reservoir of the proposed Athirapilly Hydroelectric project (*Sanctuary* Vol. XXIV No. 6, December 2005).

Hornbills are extremely sensitive to any form of disturbance. Their long bills prevent binocular vision, but their sharp eyes and good hearing alerts them to the slightest movement or flutter on the forest floor. When we approached their nests, we virtually tip-toed through their universe, scared we might cause them to



AMITHABACHIN

The tropical moist forests of the Nelliampathy, Vazhachal and Sholayar are perfect for hornbills that need old growth trees to nest. Protecting these biodiversity-rich forests are vital to reverse the decline in hornbill populations.

abandon their nests. And now we hear of plans to ravish this fragile habitat using bulldozers, dynamite and tractors. There is probably no better way for the Government to *officially* send hornbills down the road to extinction than to build a dam and drown their world. Hornbills have no major predators in the wild. Humans are the most dangerous animals on earth as far as hornbills are concerned.

IT'S ALL ABOUT FOOD

During the incubation period, the male hornbill is every bit as crucial to the survival of its family as the female. He is their only source of food and if he were to suffer any mishap, the entire family is doomed. We found the Great Hornbills foraging on as many as 44 species of fruiting trees, including 15-19 species of figs (*Ficus*). Figs are energy-rich sugary fruits that also supply oil and fat-laden seeds. *Ficus* species fruit all year round and this suits hornbills perfectly. *Ficus* trees are a keystone species in moist forests and over 1,000 different types have been identified in the tropics. Of course, other evergreen forest trees (*Palaquium ellipticum*, *Syzygium* sps., *Vitex altissima*, *Buchanania axillaris* and *Myristica* sps.) are also a food source for hornbills.

During incubation, we saw the male feeding the female three or four times each day, usually once early in the morning and late evening and a couple of times in between.

When passing on food he clings to a branch or directly on to the bark of trunk near the entrance, looking for all practical purposes like a huge woodpecker! The slanting manner in which the male clung to the tree trunk provided us a conveniently clear view of the feeding process. The male would regurgitate each fruit, collect it at the tip of the long bill before carefully feeding his mate through the narrow opening. A single feeding would last between five and 20 minutes and perhaps over 100 fruits were passed on if the fruit size was large. When smaller fruit was all he could get, the number would exceed 250! In our study area, figs constituted the main food supply in the early stages of growth and later fruits and seeds of *Myristica* and other plants of the family, *Lauraceae* were added.

We noticed that the feeding frequency increased as the young ones grew. The actual incubation took between 30 and 40 days, during which the father got almost no rest at all. And when fruit trees were not abundant, life became really tough for him. Little wonder that fruiting trees determine the clutch size and nesting success of hornbills. Because the nesting period coincides with summer, incubating duties for the mother are not exactly easy since she must stay cooped up in her self-constructed prison for as long as three or four months.

In a process that is now well documented, the maturing of hornbill chicks is synchronised with the fruiting rhythms of forest trees.

When the young ones emerge from their eggs, the normally frugivorous hornbills feed them with snakes, lizards, small mammals, eggs and nestlings of other birds, for two to three weeks. This protein-rich food is obviously vital to the fast-growing hatchlings. Often we witnessed the male carrying long snakes rolled in his beak, which the female would tear to pieces before feeding her chicks. Apart from snakes, we also saw the chicks being fed mice, lizards, hill myna eggs and hatchlings. R. Kannan reported the Valparai hornbills feeding nocturnal flying squirrels to their young. As they grow, the young birds will revert to their fruit-eating ways. We noticed that in the final stages of nesting, the parents fed their young ones nutritious seeds of wild *Myristica*. In a process that is now well documented, the maturing of hornbill chicks is synchronised with the fruiting rhythms of forest trees.

All this time, the male is extremely cautious. The male we had been watching would approach the nest only after scanning the nest surroundings for as long as 10 or 20 minutes, especially if he sensed humans were around. During intervals he would rest on a nearby tree, alert at all times to any danger to his family. From where we hid, we could hear him call constantly to inform her of his arrival. The female never made any loud sounds at all. She responded by tapping gently on the tree trunk with her beak. If the male was late, the female would continuously look out through the narrow slit. If she and the young one were very hungry, she would tap more purposefully to indicate her impatience. And if the food was not to her liking she would make her displeasure known in the most direct way imaginable, by throwing it out of the nest! All through the process, we saw the female constantly repairing the nest using her excreta.

Evolution has equipped hornbills with the ability to craft very inconspicuous nests. If you do not know it is there, you would almost certainly miss the narrow opening in a huge rainforest tree. Only in the early mornings and late evenings, does the male spend time near the nest and when he does, the family's intimate vocal communications are a treat to listen. I recognise the low, 'koa.. a.. ack... koa..a..ack', which almost sounds like a low growl! When disturbed, the male flies away quickly, only to return hours later.

THE MAIN THREATS

Hornbills are at the peak of their evolution. In an ideal world they should 'rule their roosts' for several million years more. But



AMITHABACHAN

Though fruits are the major source of food for hornbills, any animal they can overpower is fair game during the nesting season. Here a male hornbill is preparing to pass on an arboreal snake to his family in the tree hollow.

CONSERVING GREAT HORNBILLS

In the past, the less than 1,500 nomadic *Kadar* tribals, endemic to the Western Ghats, have been known to hunt the Great Hornbill or *Vongal*, as they refer to it. In 2004, Nagesh Prabhu, IFS, Conservator of Forest, Central Circle and Mr. Muraleedharan, D.F.O., Vazhachal Forest Division of the Central Forest Circle of the Kerala Forest Department initiated a participatory conservation project that has transformed them into custodians of the forest instead. Though the fund allotted (one lakh rupees per year) is limited, the project is making a considerable difference, involving members of tribal forest protection groups (Vana Samrakshana Samithis) from six *Kadar* tribal settlements. Regular monitoring throughout the year and extra protective measures during the nesting season have been initiated. Tribal volunteers were trained to collect information on population status, nesting behaviour and threats, and a parallel awareness programme was also conducted among the non-volunteers. With more such support and serious, long-term conservation efforts, there is still hope for these threatened guardians of the rainforest.

what are they to do about us humans? The prime threat to the species, apart from increased poaching, comes from a lack of suitable forest trees in which to nest and feed. As mines, dams, roads, commercial plantations and agriculture make deeper incisions into our wildernesses, the hornbills dwindle and with them the regeneration of the forest itself is affected. We saw a pair that could not nest because they could not find a nesting tree. Man-made fires also take a vicious toll and in the summer of 2004, fires started from nearby plantations and human settlements seriously damaged almost all the forest areas including the *shola*-grassland ecosystems. Only a few

patches of rainforests in the deep interiors and the wet riparian stretches escaped. When large trees caught fire, young hornbills perished when their parents were forced to abandon nests. The fires raged for several weeks and damaged the buttresses and root systems of the giant evergreens that are not fire resistant. A month later, many large trees collapsed.

THE NEXT GENERATION

The purpose of all species is pass genes on to the next generation and then the next. This we saw our hornbills do very effectively indeed, though they had no way of knowing the trials and tribulations we humans were creating for their young.

Vital cogs in rainforest wheels, the specialised feeding and nesting behaviour of hornbills makes them truly unique. Their vital role in the regeneration of these fragile rainforests cannot possibly be overstated.



The chicks took 34 to 43 days to hatch, after which their chirping calls could easily be heard. The female only emerges from her lonely parental vigil after the chick is a month-and-a-half old. The female is best identified by a lovely white band around her eyes, which the male lacks. She is comparatively smaller and looks beautiful and healthy in her new crop of feathers. She tears away the entrance to the nest with help from her mate, after which they both carefully close the entrance again so the chicks that must remain inside can be safe. Now both male and female take turns to feed their family, one invariably on guard duty at the nest.

As I sat in my hide, peering into the narrow nest hole, I saw a miracle of hornbill life unfold. Before me, a fully-grown chick emerged tentatively, some 25 days after his mother left. The chick tested his wings again and again, holding on to the branch for dear life. It did not sport the magnificent casque of its parents. That would come later. The parents sat nearby, probably coaxing and encouraging their ward. After much wing flapping, the chick lifted itself slightly and slowly moved off to glide to another lower tree branch. Watching the first moments of freedom of this beautiful bird was an incredible experience.

Soon, the family would start foraging together on tree tops and fly from mountain to mountain across the valleys. They would join other families to form large flocks of 15 to 50 birds. I knew my *Kadar* tribal friends and colleagues would be delighted that we had shared one more nesting season and we would eagerly wait to hear to the huge 'whoosh...whoosh' wing flaps and the 'tock ... tock' calls resonating over the valley. As I made my way back down from the hide, I found myself saying a silent prayer for the birds, in the hope that no humans would ever be able to destroy their misty, evergreen rainforest home. 🐦

The author would like to acknowledge Dr. S. Santhi for her suggestions and inputs and also the Kerala forest Department and Kadar tribes.



AMITHABACHAN

The low-altitude riparian evergreen forests of Vazhachal are home to all four hornbills – the Great, Malabar Pied, Malabar Grey and Common Grey (above). The *Kadars*, nomadic tribals endemic to this part of the Western Ghats, find hornbill nests by looking for feathers and excreta (carefully ejected by mother and chicks outside the nest!) below the nesting trees. Discarded and regurgitated *Myristica* seeds (top) were found by the author below the hornbill nests



THE GREAT HORNBILL

Great Hornbills *Buceros bicornis*, 1.3 m. long, are the largest of the nine Indian and 31 Asian hornbill species. They are considered one of the most threatened of the world's 54 hornbill species. Like all other hornbills of the world, Great Hornbills also nest in natural hollows of trees. Their resonating 'tock...tock...tock' calls and the whooshing sound of the wing flaps gave them the name '*Malamuzhaki*' (resounding in the mountains). Their distribution ranges between 300-1,200 m. altitudes of the tropical humid forests of South and South East Asia. In our study area, we were able to locate the Great Hornbill nests between 200 and 1,400 m. altitude. In India, they are found in the rainforests of Western Ghats and Eastern Himalayas. The world's only National Park meant for the protection of the Great Hornbill is the Khao Yai National Park in Thailand. The Vazhachal Forest Division contains similar habitat and hornbill population density. This area should be given Protected Area status immediately and all steps must be taken to ensure that the decline of this species is reversed.