



**THE DEFRA/FFI FLAGSHIP SPECIES FUND SMALL  
GRANTS PROGRAMME**



**Interim Progress Report**

Name of the organization: **Applied Environmental Research Foundation.**

Name of the project: **The Great Hornbill- Flagship species of the Western Ghats.**

Project Initiation month: **August 2007**

Report month: **March 2008**

Prepared by: **Khrishma Mandalia, Archana Godbole, Sameer Punde, Jayant Sarnaik, and Ketaki Gokhale.**

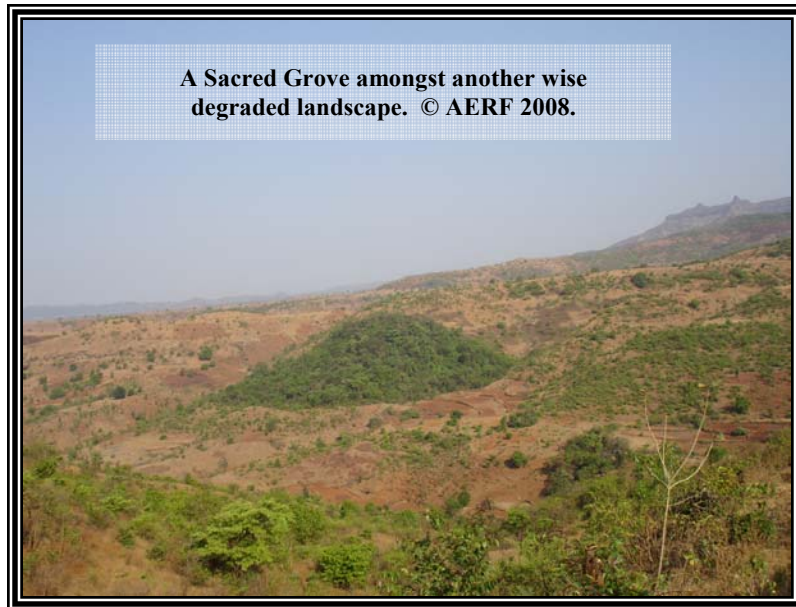
**Introduction:**

The Applied Environmental Research Foundation has been Foundation (AERF) has been partaking in participatory biodiversity conservation for last 13 years in India. A major section of AERF's work has been on the participatory conservation and eco-restoration of degraded Sacred Groves- traditionally protected biodiversity rich forest fragments – in the Northern Western Ghats. This region of the Northern section of the Western Ghats, locally known as Konkan, contributes to one of the 34 Global Biodiversity Hotspots.



**A Rare Sight – A Great Pied and Malabar Pied Hornbill sat next to each other on a *Ficus benghalensis* within our study area. © AERF 2008.**

Over the years there has been extensive research conducted on both flora and fauna of the Western Ghats, however majority of this has be focused on the Southern Section, where the traditional protected area network plays a significant role in maintaining a rich and varied biodiversity regime. The Konkan area, in contrast, houses only on average a 2% coverage of protected area land within it constituency, and thus the Sacred Grove, network play an increasing important role in maintaining small patches of biodiversity in an otherwise quickly degrading landscape matrix.



Though the land which hold the Sacred Groves belong to the revenue department, the locals view them are their own. This is due to the premise that the sacred groves house the village temple and the forest around it is sanctified. The landscapes around the groves themselves have

seen the adverse effects of amplified human pressures from increasing housing, agriculture and grazing needs. There are few mega flora species in areas outside the villages themselves or the groves. Thus these groves make up a patchwork quilt effect with differing levels of land degradation. AERF's long-standing efforts in the conservation of Sacred Groves and forest biodiversity, had lead to their understanding of the importance of Hornbills as seed disperser of endemic medicinal and important climax tree species of this region. Thus through the current project, the flagship species – **Great Pied Hornbill** (*Buceros bicornis*) and **Malabar Pied Hornbill** (*Anthracoceros coronatus*) will also be used as important tool to promote conservation of important plant areas such as **Sacred Groves** as well as rare and endemic tree species such as *Antiaris toxicaria* besides assessing their conservation status and role in forest regeneration within the project area.

### **Study Area:**

Since the start of the project our study area has been narrowed down from covering all three blocks that make up the Konkan region to primarily focusing on the Ratnagiri district between the Western Ghats to the east and the coast to the west within the Maharashtra state. The forest types range from dry deciduous to evergreen forests in this region. Chiefly this is due to time and logistical constraints, but also to the fact that there are no protected areas within the Ratnagiri district and as little as 0.8% of land under is government protection and there is a reasonable population of hornbills present. However, surveys and awareness generation efforts have also been conducted in Sindhudurg district to the South and the Raigad district to the North.

## Objectives completed to date:



AERF submitted their first progress report back in November (see attachment) detailing efforts entailed in achieving our first two objectives: 1) Performing a detailed literature survey and expert consultations; and 2) Conducting an 'awareness generation programme' as a

communication strategy for conservation action. A brief over-view of these actions has seen stakeholders and other NGO's being targeted in over 50 villages and 15 schools, thus allowing a network of 'watchers' to develop over the area, that have in the following months been AERF's 'eyes and ears' for the presence of Hornbills within their own communities. However, we have also collected GPS point counts of Hornbills when ever we have spotted them in the study area noting the number, sex, activity and the direction of arrival and departure. We assimilated all the information from these activates to establish the areas where nesting sites were most likely in the initial phase.

The major objectives that AERF has been working on since the initial progress report are: 3) Understanding nesting and feeding behavior/preferences; and 4) Capacity building. Though at first these objectives remained separate, it has come to light that these have now combined, due to the constant involvement of local communities in developing our understanding of Hornbills and their role in forest conservation.

Capacity building is the very crucial component of the project from the perspective of long term conservation of Hornbill.

Awareness generation programs coupled with capacity building has an important role to play for spreading the message of importance of hornbills in regional biodiversity conservation and consequently survival of Hornbills.





### *Framing a Hypothesis:*

The months of December and January saw work being conducted on locating and tracking hornbills, through the point count method in order to establish possible nesting trees for both species, whilst conducting an intensive search for suitable cavities that may be utilized by Hornbills in and around sacred groves (see appendix 1). Once a possible cavity was located the team established various height measurements of the cavity and the tree structure, such as height of canopy, tree and cavity, the orientation of cavity, and the nearest branch to the cavity. An intense ground search was conducted around the cavity tree to look for any un-germinated seeds and regeneration of saplings of from species which we thought that the Hornbills might be exploiting, such as **Ficus** sp., and **Antiaris toxicaria**, from the previous year.

Efforts were also taken to survey areas not just within the sacred groves or around villages where sightings could be quickly established, but in private forests/lands where disturbance levels are lowest. However, whilst conducting these searches we quickly established that there is major lack of mature trees with suitable cavities and a low presence of Hornbills within these areas. Thus our hypotheses was formulated to be: **The lack of old sizeable trees with naturally formed cavities in private owned forests/lands (99.8% in main study district) is leading to adaptation in Hornbills, in the Konkan region, to nest in areas of high disturbance in and around sacred groves and human habitation.**

### *Establishing Nest Sites and Capacity Building:*

During the first week of January we also located what looked like a possible Great Pied Hornbill nesting site, though it was initially deemed as improbable due to its location. The local community repeatedly insisted that the site had been active for at least the last three years. The improbability of site was due to

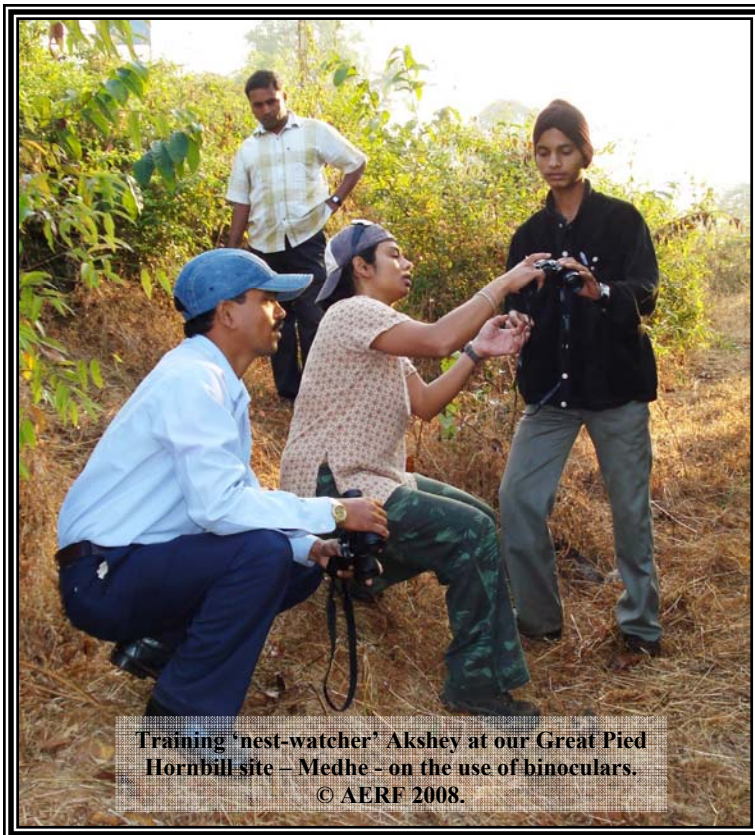


location, some 18 meters of a national highway with a pedestrian/livestock path running directly under it. The site is a large *Terminalia bellerica* and three *ficus* species complex. Efforts were undertaken to monitor the site daily, and we quickly established that in fact, the site was indeed a nesting area for this species, with a pair of Great Pied Hornbills repeatedly visiting the tree and the female making preparations to a cavity. Thus our one and only Great Pied nest site, to-date, was established, with the female entering the nesting cavity between the 7-9<sup>th</sup> January.

We repeatedly spoke to the local villagers about employing a local youth as our 'nest-watcher' to undertake our data collection, whilst protecting the site for major disturbance. The term 'nest-watcher' has been phrased with the emphasis to capacity build within the local community, who has been trained by the field team with a payment allowance. Some resistance was at first seen, as locals, not only in this village but other villages where nests were later found, due to their lack of understanding in the importance of the Hornbills. Educating the village and our constant appearance every few days was the first step in capacity building. We eventually established and trained a youth 'nest-watcher' to collect data for a detailed ethogram (an activity budget) to allow data to be collected on behavior and foraging preference of the Hornbill pair (see appendix 2). 'Nest-Watchers' have been

provided with binoculars, a compass, data collection note books, a diary, and pens.

The ethogram was two fold and aim to collect data on the behavior of the male that was feeding the female within the cavity whilst the foraging preference was aimed at that of the female within the cavity. As the current primary researcher on the project does not speak or read the local language the aid of the local assistant was invaluable, allowing the data collected to be translated to English on a regular base in order to



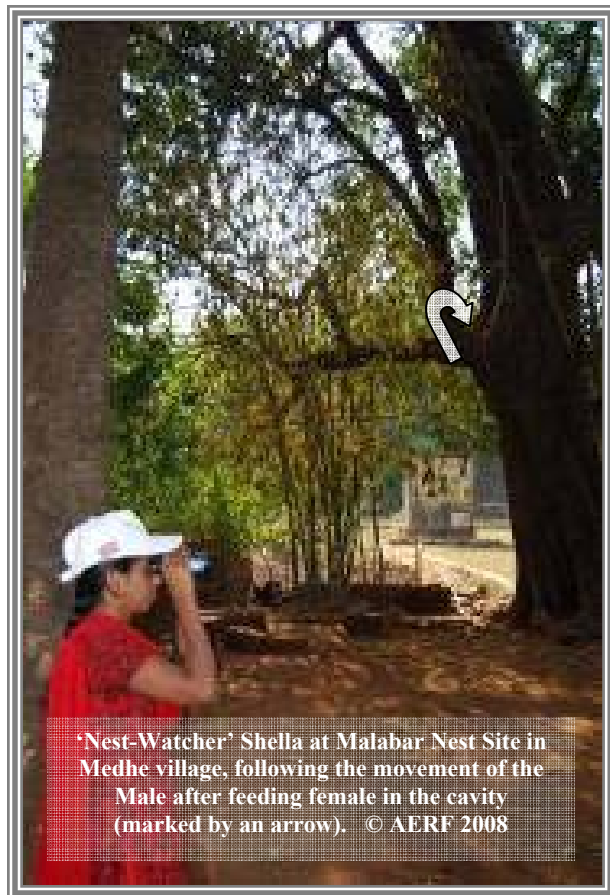
Training 'nest-watcher' Akshey at our Great Pied Hornbill site – Medhe - on the use of binoculars.  
© AERF 2008.

ensure that collection was accurate. The ‘nest-watcher’ also collected any dropped fruits from below the cavity, to later confirm the foraging fruits to later dried and weighed.

Since then further intense searches have been undertaken to locate more Great Pied Hornbill nesting sites. We have established sightings in 4 villages, however with several man-hours spent on trying to track these sighted birds we have failed to locate anymore active nests for these species. This is due to the distance that these birds can fly in one go, and the highly undulating terrain of the ghats landscape. One of our major sightings was during the month of February, when a flock of 9 Great Pied Hornbills was seen foraging on *Strychnos nux-vomica* at the Sacred Grove of Bowdhe. There were at least 3 adult males and 2 sub-adult females in this flock that we could identify before they left the site. The same site has also seen 2 pairs of Malabar Pied Hornbills, and one Common Grey Hornbill foraging on the same day.

We later established that within the village – Medhe, adjacent to the Great Pied Hornbill nesting sites also houses a Malabar Pied Hornbill nesting site. A ‘nest-watcher’ has also been established at this site, thus allowing us to gather not only information on foreing preference for each of the Hornbill species nesting within a kilometer radius, but will also enable us to looking at competition patterns for the same foreing matter.

This methodology of tracking hornbills and locating nesting sites, whilst interacting constantly with local communities, has enabled us to establish 1 **Great Pied Hornbill** and 13 **Malabar Pied Hornbill** nesting trees. All sites to-date are in and around villages within short distance from a Sacred Grove. All the nesting tree species are either **Terminalia bellerica** or **Alphonso Mango** trees. The AERF teams has now trained and enlisted a ‘nest-water’ at the Great Pied Hornbill and 5



‘Nest-Watcher’ Shella at Malabar Nest Site in Medhe village, following the movement of the Male after feeding female in the cavity (marked by an arrow). © AERF 2008





Malabar Pied Hornbill nest sites. The 'nest-watcher' team consists of 3 males and 3 females ranging from the age of 17 – 30, thus allowing a varied scope of built capacity and understanding within the local population.

5 of the 13 sites Malabar Nesting sites have been chosen for monitoring during this year's project. Monitoring sites have been chosen on the strength of varying

disturbance levels directly around the nesting tree, and only site is within a small Sacred Grove, in a village, that is completely undisturbed within this parameter. Thus, AERF will be able to establish if the adaptation of Hornbills to nests within human localities it truly successful, or if this is disturbance may have a detrimental effect of breeding success of these species. Along with the detailed ethogram that each 'nest-watcher' is collecting, we have also asked them to collect information on disturbance such as if the male is coming to feed the female, does he fly off before feeding if a human is in the vicinity of the tree, and how long and how many attempts it takes him to feed the female if there are other human disturbances in the locality. This was not done as an experiment our part but to show how the real situation of high disturbance within the village might affect the feeding attempts and thus energy levels of the male.

### Results to date:

Nest-watcher roles have been further developed to encompass a protectional role of both the nesting site and of foreing fruit trees within the area. Their personal understanding on the importance of Hornbills as seed disperses has come from their own data collection observations. This has been used to help spread information within their communities. Personal initiative shown by one 'nest-watcher' lead us to conduct a 2hour interactive presentation and discussion at his high school, with our 200 youth and teachers present. These

direct interactions lead us to confirming another Malabar Pied Hornbill nest site.

We have established that the Great Pied Hornbill is utilizing over 15 different species of fruit for foraging other than ficus sp. As there is no other site that we have been able to monitor for this species we can not compare it with another nesting pair directly. Instead the Malabar Pied Hornbill pair nesting in the vicinity is showing a great overlap in foraging preference, though its diet is not as varied. AERF's team is finding that micro-climatic variations are playing a major role in fruiting times of many trees, thus though the general abundance of a particular fruit may not be present, there



might be one specific tree that is fruiting, which both species are heavily utilizing.

Within the Malabar Pied Hornbill sites we have noted a great variation in diet preference for this species. This variation is due to the availability of fruiting material present in the proximity of each nest site. One site in particular is heavily

dependent on human crop fruits such as guava, cashew and beans, in comparison to other species. The AERF team is finding that though Hornbills have adapted to utilizing trees within proximity of human habitation, they do not seem to have adapted to the levels of disturbance that is present at the sites. Results are showing that male hornbill can make as many as 10-15 attempts to approach the cavity entrance with food material for the female and/or nestlings. It has been seen on at least occasions that the male will eat the fruit or animal forage himself if repeated attempts are unsuccessful. The affects of added energy needs for the male, and the long periods of waiting for food for the female and nestlings are not yet known.

### **Future work:**

Once the breeding session at each site is completed we hope to establish the status of breeding density and success within the Konkan region of Ratnagiri. Data collected through the ethogram will provide us with a comprehensive



list of fruiting species exploited by Hornbills. Radiating belt line transects from each nest tree in combination with the fruiting preference list will be used to collect data to foraging fruit trees around a 2 km radius of each site (see appendix 3). A combination of mapping and ethogram data will help us establish which areas the males are likely to be visiting at different time frames of the breeding cycle. GPS point of specific trees will help us map these locations, which we can then monitor for exact fruiting times in the frame-work of a follow-up project.

The AERF's team aims to set up at least one nest box at the end of this breeding session, in light of the fact that only one Great Pied Hornbill nest has been establish to-date, though there have been several sightings of



individuals. The lack of previous knowledge of active sites meant that these could not be implemented prior to this year's breeding session. The team felt that adopting a standard 'post-box' style nest box was inappropriate without former understanding of habitat preference and behavior of the male during breeding session. We aim to take measurements of the current active Great Pied Nest site and make a natural style next box by carving out or enlarging an existing cavity within a section of cut or naturally fallen tree. The nest box well then be secured into a branch folk of a tree complex where the surrounding habitat is deemed most favorable with the least disturbance. A 'nest-watcher' will be employed to keep an eye on the cavity and report any Hornbills attending the tree or the nest-box.

### **Achievements of the Hornbill Flagship Project:**

AERF recently held a research team training session for their entire project base, which was luckily conducted at the field office for this current project. 15 members of AERF's staff gathered over four days during which one day saw complete attention to the feedback of current projects all over India. This gave the Hornbill Flagship team the great opportunity to invite all the



Five nest watchers attend AERF staff team training session, the lady in the blue is explaining impacts of human disturbance at her nest site. (The star above each head indicates a 'nest-watcher')

'nest-watchers' to that session, so that they could not only meet each other for the first time, but interact amongst themselves and other AERF project teams.

Each of AERF's project team was asking to make a small verbal presentation of about 40 minutes to educate other

members of their research. However, the Hornbill Flagship project took over the session and last the full morning. Each 'nest-watcher' was given the opportunity to voice their individual findings and understanding of the project to the entire AERF staff. The impact that this generated within AERF staff was outstanding, as we could demonstrate that within the space of 6 months and with such a small budget, we can establish a real working understanding within different sections of the community on how Hornbills play an important role in forest conservation. Thus, our overall aim in establishing Hornbills as flagship species for conservation of forests in the Northern Western Ghats came in to its own force. We hope to further utilize this nest-watcher group for future meetings with local stakeholders, communities, and further conservation work in the Konkan region.

### Acknowledgments

We are thankful to DEFRA and FFI for providing us with the opportunity to broaden the conservation of forests and Hornbills with a truly community based approach. We are also thankful to RSPB who donated two pairs of binoculars and a spotting scope, which has beyond doubt aided our efforts at identifying fruits that are being utilized at nest cavities. Most of all our acknowledgment go to the AERF 'Nest-Watchers' who are learning much as we are on the importance of Hornbills in forest conservation, and without them the on-the-ground use of Hornbills as a Flagship may not have materialized.

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