

Project Update: November 2009

Asian hornbills are large frugivorous birds of tropical South and South-east Asia. There are 31 known species of Asian hornbills. They nest in natural tree cavities of large emergent trees formed by fall of branches or made by other birds like woodpeckers and barbets. Logging often results in loss of these large trees and of their important food plants. It therefore potentially poses a severe threat to hornbill persistence in areas. Many local communities also hunt hornbills for their meat or their body parts. Hornbill casque and tail feathers are important components of the local customs and traditions of many a tribe across South-east Asia.

In the state of Arunachal Pradesh in north-east India, we have five species of hornbills, the great hornbill, rufous-necked hornbill, wreathed hornbill, brown hornbill and the Oriental pied hornbill. The tropical wet evergreen forests in the state face severe threats from logging. Few local communities also hunt hornbills because of the cultural values attributed to hornbill casques or tail feathers and for their meat. I have conducted a study investigating the relative influences of logging and hunting on hornbills at two spatial scales. At the local scale, I focused my attention on the eastern portion of the state while at the larger scale I sampled across the three main administrative forest classes (Protected Areas, Reserve Forests and Community Forests) across the state. The local scale study was more intensive where a few sites were monitored for duration of 4-6 months for hornbill abundance in the area. The larger scale study was a rapid survey across the entire state to gauge the general status of hornbills in the state across the three different administrative classes. This effort was planned to compare hornbill presence along a gradient of protection and logging and hunting pressures.

At the local scale in eastern portion of the state, I established 16 trails across seven different sites along a gradient of hunting and logging pressures. I had identified hunting and logging pressures at each of the sites based on a previous survey in the area. Trails in Namdapha National Park acted as our control site with no logging and minimal hunting pressures. These trails were monitored from November 2008 – May 2009. I did systematic vegetation sampling along each of the trails to estimate habitat structure parameters like tree density per hectare and total basal area per hectare, which were used as indicators of forest quality. I interviewed at least two key informants per site to obtain information on hunting pressures on trails. These key informants were expert local hunters staying in the village nearest to the trail. To investigate the influences of logging and hunting on hornbill abundances we did Analysis of Covariance with hornbill encounter rates as our response variable and hunting intensity (high and low) as a categorical predictor variable and total basal area as a continuous predictor variable.

I found that of the four species of hornbills (except the Oriental pied hornbill which I failed to detect at most sites), great hornbill and rufous-necked hornbill were negatively affected by hunting. Their encounter rates dropped drastically at sites with high hunting pressures. One of the local communities (Tangsas) targets great hornbill for its tail feathers. Wreathed hornbill and brown hornbill did not show significant trends with either logging or hunting pressures. The four species failed to show significant trends with total basal area per hectare. I was also able to estimate individual densities of the Great Hornbill at a logged site ($1.4/\text{km}^2$; CV = 44.1%) and Namdapha National Park ($1.2/\text{km}^2$; CV = 48.9%). I estimated densities of the Endangered rufous-necked hornbill in Namdapha National Park ($6.5/\text{km}^2$; CV = 17.9%). Namdapha National Park spread over an area of 1985 km^2 is thus an important habitat for the rufous-necked hornbill whose populations are declining throughout its range.

At the scale of the state of Arunachal Pradesh, we carried out a rapid survey across eight Protected Areas, six Reserve Forests and six Community Forests. Protected Areas are on paper supposed to be

inviolable areas, wherein extraction of resources (except for subsistence in cases of Wildlife Sanctuaries) and hunting of animals is prohibited. Field staff are appointed specifically to enforce the stringent wildlife protection laws of the country. Reserve Forests on the other hand are supposed to have some consumptive value, where regulated extraction of wood is allowed but hunting is not. The community on the other hand has rights over the Community Forests, although they are technically under the Forest Department and classified as Unclassed State Forest. However, for all practical purposes, the communities have de facto ownership of the land and can control/regulate the use of resources according to customary laws. On paper, even in Community Forests, hunting of any scheduled animal species, unless it is declared as vermin, is not allowed. However, in Arunachal Pradesh, hunting has strong cultural values and it is more open as compared to other states in peninsular India. Enforcement of the law is therefore difficult. In addition, Community Forests do not have forest protection staff to ensure enforcement of wildlife protection laws. Therefore, I expected differences in the hornbill abundances across the three different forest categories because of differential logging and hunting pressures.

At each of the sites, I walked trail at least twice. I also did vegetation sampling along the trail and interviewed key informants (local hunters) to assess the presence or absence of species in the area. If a species was not sighted in the area, I asked the key informants whether they had detected the species in last 5 years.

I found that hornbill encounter rates differed across the three administrative classes. Protected Areas fared much better than Reserve Forests and Community Forests. Reserve Forests, though they had lower tree density and total basal area per hectare, had higher encounter rates of hornbills. The interviews with local hunters suggested that rufous-necked hornbill had not been detected in the last 5 years at two sites while the great hornbill had not been detected at five sites in the last 5 years. Surprisingly, even the two smaller species of hornbills, the Oriental pied hornbill and brown hornbill, which are not targeted by the local communities but are hunted opportunistically, had gone locally extinct from two and one area respectively.

Way ahead

Now, I am planning to initiate a study at village level, where I will investigate the hunting pressures on different species of hornbills at sites where the locals attribute values to hornbills and at sites where they do not. I am also planning to do socio-economic profiling of the villages to understand what the contribution of hornbills is (by the sale of body parts like the tail feathers each of which can cost up to 250 INR) to the overall economic benefits gained by the hunters. I am planning to continue monitoring of the 16 trails for the next 6 months. I am also planning to survey more areas in central Arunachal Pradesh across a few Protected Areas, Reserve Forests and Community Forests.