Living with elephants in Assam: a community-based approach to conservation

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Introduction

The North of England Zoological Society, which runs Chester Zoo, has nine major field conservation programmes around the world focusing on different regions or species, one of which is the Asian elephant programme, the main component of which is the Assam Haathi Project (Haathi is Hindi for elephant). The Assam Haathi Project (AHP) was initiated in 2004 in collaboration with EcoSystems-India, a local Assamese NGO, and was awarded a three-year Darwin Initiative grant in 2007.

Northeast India is recognised as a high priority area for Asian elephant conservation (Choudhury 1999), with Assam harbouring one of the last remaining large and viable, yet also most acutely threatened Asian elephant populations (c.5000). The current population of 28 million people in Assam, coupled with the increasing demand for land rights, is resulting in habitat fragmentation through unsustainable extraction of forest products and slash-and-burn agriculture. The most visible and immediate effect of this is direct conflict between elephants and people (Tchamba 1996; Kushwaha & Hazarika 2004). Asian communities traditionally and culturally revere wildlife, especially elephants, who are entrenched in the Hindu and Buddhist religions. An indicator of the severity of this conflict is reflected in the actions of the communities which, within the last decade, have resorted to poisoning and electrocuting elephants in desperate attempts to protect their lives and livelihoods (Gureja *et al*. 2002). Any species negatively impacting upon people's livelihoods erodes local support for conservation (Hill 1998) and therefore mitigating human-wildlife conflict is a conservation priority (Hill *et al*. 2000).

Human-elephant conflict (HEC) is a complex and pervasive problem throughout the elephants' range in Africa and Asia. One of the major forms of HEC is crop raiding; which can be devastating

for the individual farmer as an entire year's worth of crops can be destroyed in one night. Consequently, HEC creates anger towards elephants from the communities who live with them, which has lead to farmers killing elephants or turning a blind eye to elephant poaching (Parker *et al*. 2007). Ultimately HEC undermines support for elephant conservation and casts an ominous shadow over the future of elephant conservation outside protected areas. Long-term strategies for elephant habitat restoration and conservation are needed, but meanwhile community tolerance levels are rapidly deteriorating. This needs to be urgently redressed so that rural communities re-gain their willingness to support and contribute to regional conservation efforts.

In this paper we discuss how a community-based approach can be used to integrate research with grass-roots conflict mitigation, using the Assam Haathi Project as a case study.

The Assam Haathi Project

The AHP aims to promote extensive community participation at all levels and focuses specifically on the conflict mitigation need of the larger elephant conservation challenge, while also conducting research on elephant spatial needs to determine solutions for long-term land-use strategies.

Study Area

The AHP works in two districts of Assam – Sonitpur and Goalpara - both of which have high levels of HEC (Figure 1). Within these districts AHP works intensively with 825 households from six villages and less intensively with a further 26 villages amounting to over 5000 households. Both districts contain a mosaic of land-use and vegetation, including rice cultivation, homestead gardens, villages, tea plantations, degraded secondary forest and protected areas. The study site in Sonitpur district covers an area of 1,175km^2 and is bordered by the protected areas of Nameri National Park and Sonai Rupai Wildlife Sanctuary to the north and the Brahmaputra River to the south. The Goalpara district study site is a 1,325km^2 transect delimited to the south by the forested Garo Hills and to the north by the Brahmaputra River. The majority of people within our study sites are employed in land-based activities; including farmers, tea-estate workers and daily labourers. Much of the farming is subsistence and therefore the effects of HEC impact heavily on the livelihoods of the local people.

Community-based elephant monitoring

In order to develop strategies for HEC management, it is essential to understand the spatial and temporal patterns of crop-raiding and elephant movement. Spatial monitoring of elephants can be achieved in various ways, ranging from expensive satellite telemetry studies to simply following elephants on foot or by vehicle. While telemetry provides accurate and ample data, it does not usually lend itself to community involvement and is highly donor-dependent. Conversely, visual tracking is an excellent way to involve communities and also provides indirect education about elephants and conservation.

The AHP follows the latter method and actively involves local communities in all aspects of monitoring elephant movements and conflict reporting. A team of 33 community members were selected and trained to enumerate HEC incidents and employed by the project as field monitors; this prevents the problem of over-exaggeration by the farmers (Siex & Struhsaker 1999). Field monitors are stationed throughout the study area to ensure adequate coverage of the elephant range. Field monitors visit all areas where elephants have been reported, recording locations using a GPS unit, and verifying any HEC reports. Incident details are recorded on a standardized reporting form (*cf* Hoare 1999) including: elephant group size and composition, herd identification (if known), time of incident, any damage caused to crops and property, the mitigation methods used, and any human or elephant injuries.

This low-tech approach facilitates repeatability across villages and districts and is easy to expand. In addition, it is self-sufficient and sustainable and can be continued by the communities without any outside input. This extensive community involvement approach encourages leadership and responsibility at the community level, and promotes knowledge sharing and capacity building.

The use of GPS allows the conflict and movement data to be mapped using Geographical Information System (GIS) software. This has enabled the identification of migration routes, conflict hotspots and seasonal variation. The crop raiding “season” in Assam runs for nine months from June to February, with a peak from October to December coinciding with the harvesting of rice. As found in other studies on HEC; crop raiding takes place from late evening to early morning (Sitati *at al*. 2003; Venkataraman *et al.* 2005). There are two identified herds within

Goalpara; one with a mean herd size of 21 individuals and a recorded maximum of 50 individuals and the other herd has a mean herd size of 22 and a recorded maximum of 35. The Goalpara herds predominantly use the forested Garo Hills to the south of the study site, moving north to the forested area by the river. Both herds are found more frequently around agricultural areas during crop harvesting season. Seven herds have been recorded in Sonitpur, with the average herd sizes ranging from three to 13 individuals. Most of the herds in Sonitpur leave the protected forests in the north around June/July and travel to the banks of the Brahmaputra River in the south, using tea-estates along the way for refuge (Figure 2). (*Herd movements can be viewed at www.wildlifetracker.co.uk/ElephantTracking)*. Understanding the migration patterns of the herds and the landscape variables which facilitate elephant movement enables the identification of conflict hotspots and prediction of crop-raiding incidences, which allows intervention work to be targeted accordingly.

Community-based crop protection

There have been various studies into how to mitigate HEC, and empowering the local community to take responsibility of the problem is considered the most sustainable solution (O'Connell *et al*. 2000; Osborn & Parker 2003). The AHP works with communities to develop intervention methods that enable them to protect their property, crops and family through non-lethal, low-cost and locally available means. There are different types of interventions, both passive and active that generally fall into three main categories:

1) *Early warning systems*: alert villagers in advance that elephants are approaching, e.g. trip wire; watchtower.
2) *Barriers*; prevent elephants from entering a particular area, e.g. trench; electric fence; chilli fence; buffer zone.
3) *Deterrents*; discourage elephants from entering an area and can also be used to chase elephants away, e.g. chilli smoke; spotlights.

Most of these methods work better in combination and communities are encouraged to alternate their use to prevent elephants becoming habituated to one particular method. The losses incurred by elephants can be vast; the total losses of crops and property from 2005-2008 in the AHP study areas amounted to almost £98,000 (Figure 3). Thus, response to the mitigations has been

positive with communities taking an active role in their use and improving or adapting the methods to best suit their needs. There has been an observed reduction in crop loss in the Sonitpur district from 227ha in the 2005/06 season to 58ha for the 2007/08. Among the methods we have tried, we found hand-held spotlights to be the most popular option. In response to demand, the AHP developed a spotlight with a voltage regulator to withstand the fluctuations in the local electricity supply (Figure 4). Spotlights are especially effective when used in conjunction with other methods such as noise, fencing and chilli smoke.

Community involvement is key for conservation

Community-based conservation has been projected as the most practical approach to stem biodiversity loss in developing countries (Mehta & Kellert 1998), however, working successfully with communities to achieve mutually beneficial results poses numerous challenges. Gaining the communities' trust and engagement through proving to the community that you are here to help them, without any ulterior motives is one of the biggest challenges and an important first step. This may take considerable time and does not usually produce measurable results, but is critical to ensure long-term success. As learnt form the Assam Haathi Project, ensuring good communication with the communities through regular meetings is important. In addition, meetings should be followed with action, which the AHP achieved through employing and engaging community members, which also helped to spread awareness of the project. Communication should be maintained throughout and interim results from the collected data should be shared with communities regularly. This not only updates them on progress, but also helps in understanding the bigger picture of human-wildlife conflict. Another key component for the success of a community-based project is creating opportunities for leadership and responsibility at the community level. For the AHP, once the community have decided on the mitigation they wish to employ, field monitors will coordinate and provide training to the villagers. This delegates responsibility to the community level and minimises the potential of language or general misunderstandings.

The AHP is becoming demand driven, with communities approaching the project and requesting assistance. In order to meet this demand and facilitate increasing the scope of the project, the

AHP has produced a handbook “Living with Elephants in Assam”. This includes illustrated step-by-step methods on how to construct, use and maintain the interventions tried and tested by the project. It also contains background on elephant ecology, the causes of HEC and what not to do when chasing elephants away. “Living with Elephants” has been distributed to 45 villages in Assam and in order to determine its effectiveness as an outreach tool, household surveys are being completed pre and post handbook distribution.

The Future

It can be difficult to determine the success of conservation projects with long-term aims, however for any project with a community-based component a less quantifiable but essential measure of success can be determined at the community level itself. Four years into the AHP, it is difficult to determine whether it has had any significant benefits for the Asian elephant, although there have been improved attitudes towards elephants in project villages and reduced elephant injury and deaths. But more noticeable is the real and immediate difference to the lives of community members that are living with elephants in the project target areas; through saving human lives, reducing serious injury and damage to property and crops. In addition, there has been spontaneous adoption of interventions by neighbouring villages not directly involved with AHP, such as growing chilli, building watch towers and testing trip wires.

However, community-based HEC mitigation is ultimately only a fire-fighting solution and does not address the root cause of the problem. Therefore, once a participatory HEC management approach has been established and community tolerance levels have steadied, the real challenge begins: how to secure the long-term survival of elephants on a landscape scale. Long-term management plans should be devised from spatial data on elephant movement, but involving the local communities is also essential. As with most management strategies, communities should be involved in the decision making process and participatory HEC management projects facilitate this through developing the necessary structure and communication pathways.

Conserving the Asian elephant is important, not only to enable the survival of ancient traditions and beliefs, but also to maintain eco-system function. Ensuring there is adequate habitat conserved for elephants through halting the fragmentation and destruction of forests is a priority.

However, adequately protecting land requires legislation, enforcement and funds; which are often lacking in developing countries. The AHP is now working towards developing a long-term management plan in Assam and while there are many options and potential challenges, the only certain aspect is that all stakeholders will need to be unequivocal in their aims and approach to achieve successful conservation of the Asian elephant and its habitat. It is unlikely there will be a panacea for human-elephant conflict, and as long as people continue to practice agriculture in areas shared with elephants the conflicts will never be eradicated. However, through raising awareness and education of non-lethal mitigation methods the conflict can be managed and the impact reduced.

For more information on the project please visit www.assamhaathiproject.com, (the "Living with Elephants" handbook will be available in English as a PDF from the website in due course).

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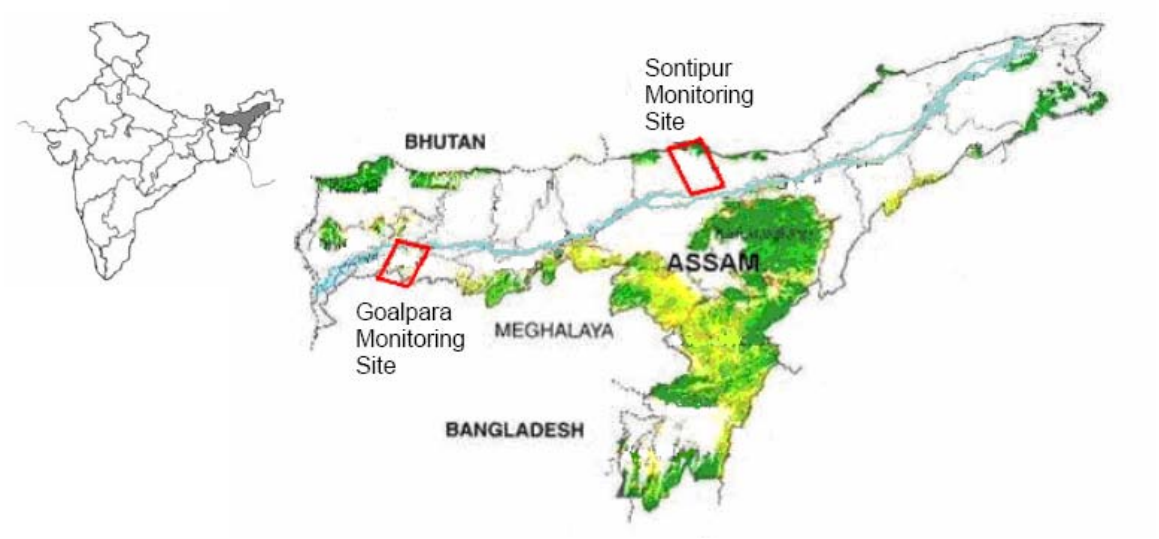

Figure 1. Map showing locations of study sites with Assam.

Figure 2. An elephant taking refuge in a tea-estate, Sontipur District.

Figure 3. Building damage caused by elephants.

Figure 4. A spotlight for deterring elephants. Made using local materials and ideal for fluctuating electricity supply.