

MANAGING 'PROBLEM ELEPHANTS'

Prithiviraj Fernando, Centre for Conservation and Research, 35, Gunasekara Gardens, Nawala Road, Rajagiriya, Sri Lanka. Pruthu62@gmail.com

The 'problem elephant' is a construct of negative interactions between humans and elephants. It may seem inappropriate or unfair from a conservation and animal welfare point of view to label an individual so, because of the negative connotation it endows and the actions detrimental to the individual that may follow. However, human-elephant conflict (HEC) is a complex, widespread and perverse issue (Fernando et al. 2008a; Fernando 2006) and its mitigation is an imperative from a human point of view and desirable from an elephant conservation and animal welfare point of view. Therefore the label 'problem elephant' should be considered a contrivance for understanding the underlying issues and taking appropriate action for the benefit of both humans and elephants.

'Problem elephants' by definition are in human dominated landscapes. The conservation of Asian elephants and HEC mitigation across the range has largely been focused on removing elephants from human dominated landscapes and limiting them to protected areas (Fernando et al. 2008a). However the abject failure of this approach in mitigating HEC other than at the cost of elephant conservation is obvious in the intensity and extensiveness of HEC that is current across the range and the loss of elephants forcefully restricted to protected areas (Fernando et al. 2008a; Fernando 2006). Thus, wherever elephants occur outside protected areas whether by design or default, managing 'problem elephants' is critical for elephant conservation and HEC mitigation, which makes it relevant across much of current Asian elephant range.

Elephant social organization

In Asian elephants, adult males and females exhibit divergent social behaviors. Adult females and their young live in herds composed of related individuals (Fernando & Lande 2000). The females in such herds form strong social bonds, and possibly associate with the same individuals throughout their lives. Males grow up in the herd they were born into but do not remain in the herd as adults. There is a popular belief that pubertal males are repelled by the adult females

in a herd. However observations on elephant behavior do not support this belief (Jayewardene 1995; Sukumar 2003). Male calves become independent and drift away from the herd of their own volition at an early age. Sub-adult and young-adult males may spend a few years in the periphery of their natal herd, but with increasing age they become independent and as adults lead a mainly solitary life. If they remain in the area of the home range of their natal herd, adult males may continue to interact with their natal herd. Adult males may also form associations with other males, to form 'male-groups'. In Sri Lanka such male-groups are frequently observed in areas such as Uda-Walawe, Minneriya and Kaudulla National Parks. However male groups do not appear to have the same level of cohesion and long term association as that of female groups. Instead they may be loose associations which are transitory.

Female elephants have a gestation period of about 22 months (Schmitt 2006) and will suckle a calf for about two to three years. On average a female may give birth every four to five years, although inter-birth intervals of about two and a half years to six years or longer have been observed. Female elephants will come into mating condition or estrus, only once every four years or so and will be receptive for a few days. Females in estrus and possibly those coming into estrus broadcast their physiological status through hormones passed in their urine and dung. As a result, adult males from the surrounding area are attracted to her and a male-male competition ensues for mating. It is the bigger males that generally win in such a situation. Therefore, it pays for a male to exploit better nutritional sources. It is thought that adult males are driven to take greater risks to access crops because of this, in a high-risk high-gain strategy (Sukumar 2003).

What is a 'problem elephant'?

While there is much individual variation in the behavior of elephants, in general adult males and females tend to respond very differently towards humans. Males raid crops to a much greater extent and



'Loku Maama' an adult male radio collared in Kaudulla Park in November 2010 and shot dead close to Kantale paddy fields in February 2011

tend to be more aggressive towards humans (Sukumar 2003). The majority of human-elephant conflict (HEC) incidents in Sri Lanka are due to adult males. Crop raiding by female herds is not common, but may vary between regions. In the South of Sri Lanka where HEC is moderate, few such instances are reported, while it is more common in the North-west, where HEC is very high. Where crop raiding by females occur, usually it is at the edge of elephant habitat in unguarded crop fields. Even when herds raid, it is relatively easy to chase them away. Herds do not break houses to get at stored grain and rarely venture inside village areas. In contrast, some males become habitual raiders who venture into and remain in villages and relatively developed areas. Some of them tend to be very aggressive and respond to attempts at chasing them by counter-attacking those who confront them. Some males regularly break down houses to get at stored grain and raid home gardens. Males that habitually enter and remain in villages or developed areas, break houses and raid home gardens, and react aggressively to attempts at chasing them away can be defined as 'problem elephants'.

Making of 'problem elephants'

At present we do not have the data to determine what proportion of males become 'problem elephants' or why it happens. However, exposure of young males to conflict situations is likely to play a major role in the genesis of 'problem elephants'. Consequently, conflictive activities such as the indiscriminate use of 'elephant fire crackers' and 'elephant drives', are likely to promote the creation of problem elephants. From radio tracking studies and observations conducted, we do know that not all adult males in a given area are 'problem elephants'. Long term research needs to be

conducted to obtain information on what percentage of males become 'problem elephants', the reasons for it, whether they tend to become 'problem elephants' at some stage of their lives, and whether they have the same behavior throughout their lives, a particular period of their lives or specific time of the year. Such information will allow us to take management actions to prevent the genesis of 'problem elephants', which should be our long term goal, if we are to successfully mitigate the HEC as well as conserve elephants.

Relevance to HEC mitigation

'Problem elephants' are responsible for most instances of HEC in Sri Lanka. The majority of human injuries and deaths occur in interactions between people and 'problem elephants'. Therefore the correct identification and removal of such individuals will bring immediate relief of HEC to an area. The current high level of HEC does not allow us the luxury of obtaining detailed information on the incidence and genesis of 'problem elephants' before undertaking actions to mitigate HEC. Therefore, while initiating research activities to obtain such information, we need to manage the current situation. The activity that will have the largest impact on mitigating HEC in the short term is the correct identification and removal of 'problem elephants'.

Relevance to elephant conservation

There is a general belief that 'problem elephants' are the dominant breeding bulls with the 'best genes', hence their removal will be very detrimental to elephant conservation. However, there is no reason to believe that elephants that are aggressive towards humans and raid habitually are necessarily the best or dominant breeding bulls. Many such 'problem elephants' are younger males and maybe non-breeding bulls. Aggression and tolerance of high conflict with humans which is central to the definition of a 'problem elephant' does not translate to aggression or dominance among elephants. The two behaviors are likely to be of divergent genesis, with the former largely driven by 'nature' or past experience and the latter by 'nature' or the genetic make up. The 'removal' from a population of any individual elephant will have a negative impact on elephant conservation as it means the loss of an individual from that population. However, in reality the persistence of such individuals in a population results in the perception of a high level of HEC by the populace. This in turn leads to enormous public and political pressure on conservation authorities to remove all elephants from such areas. Therefore, if the removal of a few 'problem elephants' enables a larger number of

elephants, especially herds being able to continue using habitat outside protected areas, it would be beneficial to elephant conservation.

Scale of the problem

The number of animals that will need to be removed as 'problem elephants' varies from area to area. Most such problem elephants have their regular home ranges entirely or largely within 'human areas'. ie. areas where the dominant land use is permanent habitations and permanent cultivations such as paddy and home gardens. Surveys in the Hambantota, Moneragala and Badulla districts indicates that the extent of such 'human areas' with elephants in these three districts is around 3,500 km². There are few if any herds in such areas (Fernando 2007). The home ranges of male elephants in Sri Lanka are around 100 km² during most of the year and as elephants are not territorial, their home ranges overlap (Fernando et al. 2008 b). Survey results indicate that 5-6 males may share the same habitat. Based on this, we can conclude that there will be a few hundred males in the south of Sri Lanka outside protected areas of the DWC, of which a proportion are 'problem elephants'. The fraction of 'problem elephants' in high HEC areas such as the North-west is likely to be much higher than in the South. Currently, over 200 elephants get killed annually due to HEC in the entirety of Sri Lanka. Most of the elephants that get killed due to HEC are in human dominated landscapes, and most of these are 'problem elephants'. The current high level of HEC persists in spite of the death of these elephants. Therefore, successful control of HEC over the short term will require the initial removal of a significant number of elephants from human areas. With continued removal over a few years, the number of 'problem elephants' hence the number that need to be removed should decrease.

Options for removing problem elephants

The only options currently available for removing 'problem elephants' from an area are

1. Translocation to DWC protected areas
2. Capture and domestication
3. Elimination

Translocation

Elephant translocation consists of capturing an elephant by darting it with an anesthetic drug, restraining it and transporting it by truck to a new location where it is released. On average, around 25 translocations are conducted annually in Sri Lanka. Although elephant



'Rawana' the tusker being translocated from Anuradhapura to Uda Walawe National Park. He was later shot dead inside Lunugamvehera National Park.

translocations have been undertaken in Sri Lanka since the 1960s, they were not monitored. It was assumed that once an elephant was released inside a DWC protected area, that it would live there happily ever after. In 2006 the Centre for Conservation and Research (CCR) initiated a collaborative project with the DWC to find out what really happened when an elephant was translocated. So far 17 translocations have been monitored through GPS-satellite collars under this project.

All the translocated elephants were males and captured in human areas. All were transported and released inside protected areas of the DWC. All of them left the DWC protected area released to. Some stayed less than 24 hours and others varied time periods up to a few months. In three instances the translocated elephant returned to the site of capture - once from almost 100 km away. Most of them showed greatly increased movements, wandering over large areas seemingly wanting to get back to their home ranges but unable to do so. Of those that finally settled down in a new area, most were subsequently implicated in causing HEC. Six of the translocated elephants got killed, five of them shot dead, within a few months of their release. They were also known to have killed at least 5 people. Therefore, we can conclude that most translocated elephants do not stay in the areas that they are released, instead returning to the site of capture or becoming 'problem elephants' in new areas.

Therefore, translocation of 'problem elephants' as currently conducted is not of much value in mitigating HEC but may result in its intensification and wider propagation.

Capture and domestication

Adult males, especially ones that are aggressive, are generally difficult to tame. Traditional taming methods carry a high risk of injury and death of the animal, which would be greater for 'problem elephants'. The 'breaking-in' period and 'taming' which are based on inflicting pain till the elephant is subjugated will be much longer with aggressive adult males, relative to females or young animals. In addition, most 'problem elephants' are likely to be mature adults and after taming will have a relatively short life expectancy of 10-20 years in captivity. Therefore, the 'demand' from elephant owners for untamed 'problem animals' as captive elephants is likely to be low.

The elephant captured and gifted to the Maligawa in 2006 is a case in point. After severe rope cuts on legs and prolonged treatment with massive doses of antibiotics entailing huge costs, it died after approximately 6 months. Catching 'problem elephants' from the wild, and auctioning or handing them over to private owners or temples, to be tamed is not a viable method of controlling the current high level of HEC.

Elimination

Although there was provision in the Fauna and Flora Ordinance for 'problem elephants' to be declared such and to be eliminated by shooting, the 2010 amendments to it removed this provision. Given the cultural, religious and conservation sensibilities in Sri Lanka, and the status of the Asian elephant as a globally endangered species, culling is not a socially and politically acceptable management method. Given the scale of the issue, culling is also not a practical option. The killing of 200 or so elephants annually as a result of HEC, does represent the elimination of many 'problem elephants'. However, such elimination as a result of HEC is an end result of severe attritional conflict, and it does little to ease the burden of HEC from the people. Most such elephants die after getting shot multiple times and in many cases it is an agonizing death with maggot infestation and septicemia from infected wounds and cannot be considered a desirable management option. The conflictive interactions including shooting that leads to the deaths of these elephants are also a major cause of HEC escalation and creation of 'problem elephants', making it vicious cycle.

In conclusion, given the scale of the issue and very limited options available for removing problem elephants, HEC cannot be effectively addressed in Sri Lanka over the short term. One way out of this impasse is to adopt an approach of developing and assessing



A cadjan hut destroyed by an elephant in Demeliya

variations of current methods that will make them more effective and developing new methods for successful removal of problem elephants.

FUTURE POSSIBILITIES

Management in a holding-ground

In 2009, the DWC initiated a trial of fencing-in a 22 km² area of the Lunugamvehera National Park with a combined high specification electric fence and a ditch, where 'problem elephants' could be managed. However, initial trials were unsuccessful as the elephants that were released into the holding ground escaped. If 'problem elephants' can be contained in such a holding-ground, translocation would become a viable option. While it is technically feasible to construct physical barriers for elephants, as was successfully done in Addo National Park in South Africa in the 1950s, it is extremely expensive with a cost of over US \$ 20,000/km (Knight et al. 2002). While electric fences are comparatively cheaper at about US \$ 6000/km, their functionality is very dependant on maintenance. Even if successful in containing them, elephants within may have to be intensively managed with supplementary feeding and behavioral modification through hormone treatment. While theoretically possible, the success and practicality of such management is unknown and will be very costly. Up-scaling to a level that can help control and subsequently manage HEC will require a major investment of funds in the order of that expended for development.

Virtual fence

A containment system such as the 'virtual electric fences' that have been used very successfully with domestic animals could be a future option for managing problem elephants. In this, an animal is fitted with a collar that provides an audible or vibratory warning when it approaches a barrier. If it continues to

approach the barrier, it receives a small electric shock. Pet animals such as dogs and cats as well as livestock such as goats and cattle soon learn not to approach such barriers and remember the boundaries even when the collar is taken off. If such a system works for elephants, 'problem elephants' could be contained in much larger areas such as a fenced park at a greatly lower cost than with a physical barrier. However, currently such systems are not available for elephants and research and development needs to be conducted to explore the possibility of adapting it to elephants.

Captive management

A facility dedicated to the captive management of 'problem elephants' would have a number of advantages over traditional taming methods, such as developing more humane and successful methods of taming and training. However, the capture and taming of a 'problem elephant' is a major undertaking that requires a high investment of funds, time and expertise for each elephant. At most such an initiative could only be applied to a handful of elephants annually. Therefore it can never make a major contribution to HEC mitigation, and has especially no relevance to controlling the current high level of HEC. It may be of value as a second option for individuals that cannot be limited to a holding ground.

CONCLUSION

Even under the best possible circumstances, removal of 'problem elephants' is only an exercise in 'putting out fires'. The current scale of the issue is so large that funding and application comparable in scale to that for 'development' is needed to bring the situation under control. However, successful long term management of HEC requires concurrent investment in a comprehensive 'fire prevention' program of minimizing the genesis of 'problem elephants'. Developmental activity conducted without appropriate HEC mitigation, land encroachment and inappropriate use of management actions such as electric fence construction, elephant drives, translocations and chasing elephants, are the main causes that create 'problem elephants'. Therefore long term successful HEC mitigation and elephant conservation is dependant on land use planning - taking into account the distribution and behavior of elephants and planned rather than ad hoc management of elephants.

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