RESOLVING HUMAN ELEPHANT CONFLICT IN THENI FOREST DIVISION, TAMIL NADU, SOUTHERN INDIA

Report to Forest Department

Theni Forest Division

By

N. Baskaran, G. Kannan and U. Anbarasan

Asian Elephant Research and Conservation Centre
A Division of Asian Nature Conservation Foundation
Centre for Ecological Sciences,
Indian Institute of Science,
Bangalore - 560 012
INDIA

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INTRODUCTION

Theni forest division lies between north latitude 9^0 31' and 10^0 27' and east longitude 77^0 11' and 77^0 47'. The division was formed in July 1982. The erstwhile Madurai South and North divisions were bifurcated to form the Theni and Kodaikanal forest divisions. Bodi Range of Madurai North Division along with Cumbum, Gudalur and Highway Ranges of Madurai South Division became Theni Division. The division is bounded by Kodaikanal Forest Division and Chinar WLS in the North and Grizzled Giant Squirrel Wildlife Sanctuary in the South, Madurai Forest Division in the East and Munnar Forest Division and non-forest areas of Kerala State in the West (Fig. 1).

The highway running from Theni to Kumily, cutting across the Theni forest division, divides Theni into Eastern and Western parts (Fig.2). Eastern part contains Varushanadu, Megamalai, part of Cumbum, Chinnamanur and Gudalur ranges, which have contiguity with Grizzled Giant Squirrel Wildlife Sanctuary in Srivilliputhur and Periyar Tiger Reserve. Western part of the Theni forest division with a narrow stretch of forest comprising of Bodinayakanur, Uthamapalayam, and part of Theni, Chinnamanur, Cumbum and Gudalur ranges. In the Theni division western side, *i.e.*, part of Cumbum and Gudalur, and Uthamapalayam ranges, which in turn contiguous with the Cardamom plantations of Kerala state, has been reported to experience sporadic incidences of crop damage by elephants during the early 1980's (personal com – Devadass by then Range Officer). However, after 2000 onwards these areas reported to experience severe human-elephant conflicts mostly by habitual crop raiders.

According to Mr. Ramanathan, Range Officer of Uthamapalayam, a herd of 11 elephants have restricted themselves to the linear stretch of the hilly forest range (Western part of Theni division), causing substantial damage to agricultural fields, especially in Kombai and Thevaram areas. At times, they also move further southward into Cumbum range where they are known to cause considerable damage to agricultural land and human lives. The elephant herd takes shelter in the low-lying scrub forest along the steams and in the big tamarind trees during the hot hours of the day. The adjoining areas of the narrow forest patch are private agricultural lands with highly preferred crops like Maize, Sugarcane and Coconut that are often damaged by elephants during night time and elephants are also known to drink water from the tanks in the fields during dry season. Several attempts to drive elephants were unsuccessful.

With a request from the District Forest Officer of Theni Forest Division during our elephant habitat survey in southern India, a rapid survey was carried out to understand the human-elephant conflict and suggest possible solutions for resolving human elephant conflict in these areas.

Figure 1. Map showing the Theni Forest Division with adjoining forest divisions.

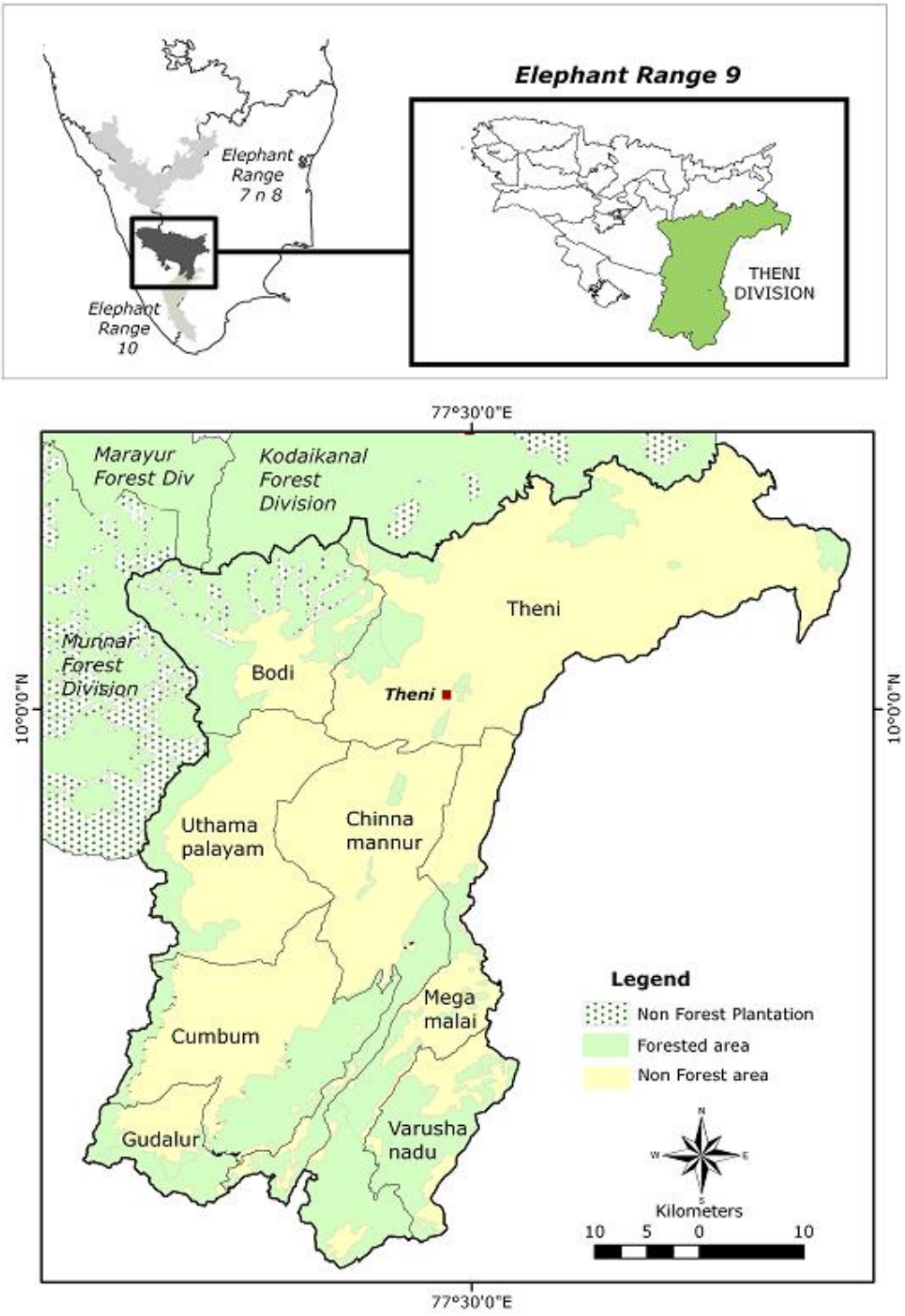
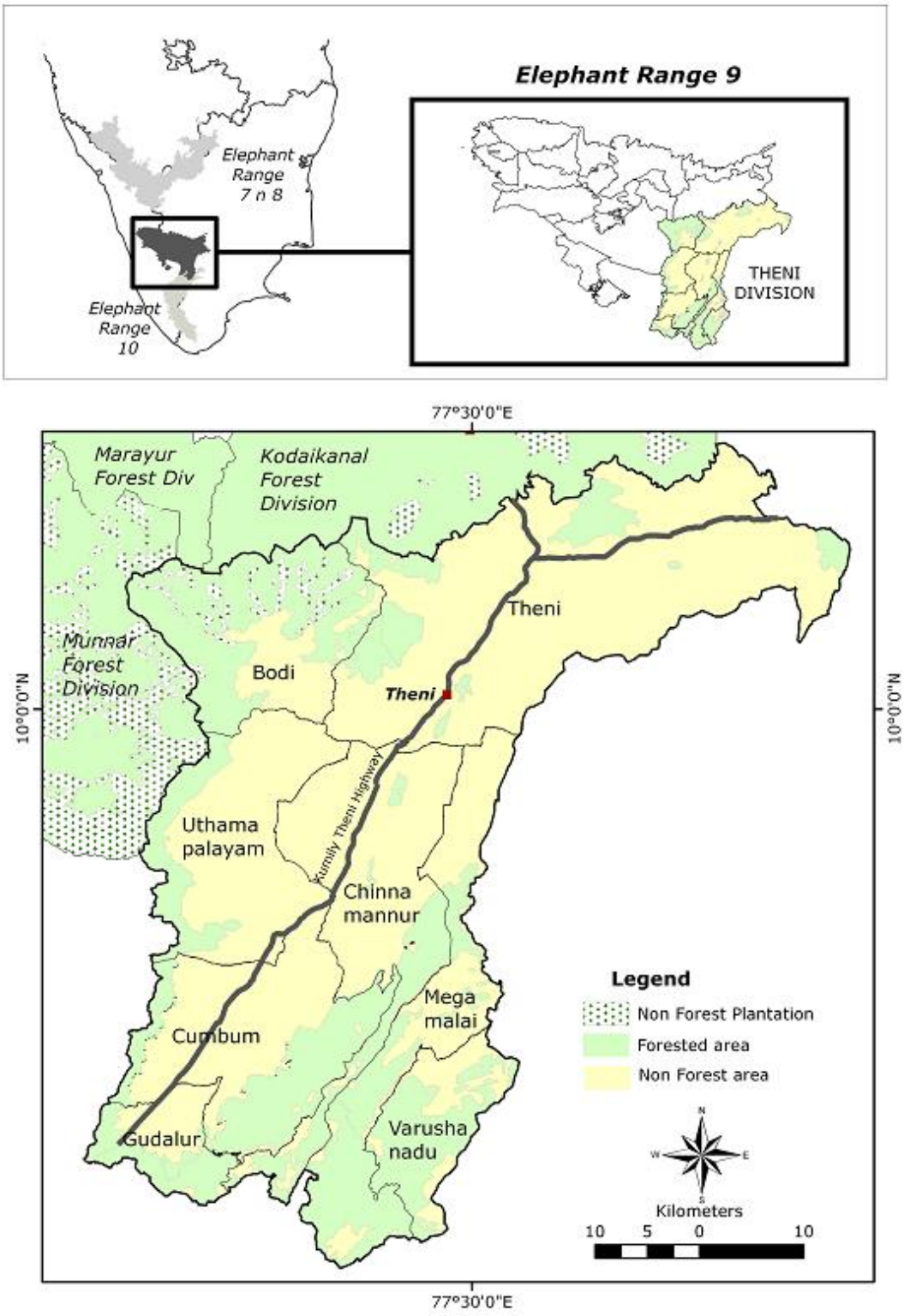


Figure 2. Map showing the Theni Forest Division bisected by the highway Theni-Kumuli Highway



Habitat:

As a preliminary step of the rapid survey, an assessment of habitat condition was carried out in the Western part of Theni division mainly to understand the forest area and forest types available. It is

Thorn forest with cashew nut plantation in Theni forest division

Primary forest with grassland

a linear stretch of hill range extending over 55 km as an outcrop of the Palani hills southern slope having wide variation in altitude ranging from 460 m to 1430 m. The profound east-west elevational gradient harbors diverse habitat types starting from tropical thorn forest on low-lying eastern side to semi evergreen forest in the higher reaches. The lower reaches and foothills consist of thorn forest with *Acacia planiformis, Azharidicta indica, Erythroxylum mongynum* and *Chloroxylum swetinia* dominating the stand. This is followed by dry deciduous forest consisting of *Terminalia chebula, Cassia fistula, Randia* and *Pterocarpus.*

Areas above 500m host moist deciduous forest with *Dalbergia, Albizzia, and Helictros isora*, and above 900m, the semi evergreen forest is dominated by *Terminalia paniculata, Bridalia, Bischofia javanica, Albizzia odoratissiama, Cinnamam zeylanica* etc. (Champion and Seth 1967).

Habitat contiguity: In order to know the habitat contiguity available for elephants and to know whether these elephants are locally isolated or part of the adjoining larger population, either side of the Theni western forest patch was surveyed. In the southern side, until the construction of the Periyar Hydro Electric Project, elephant movement was reported in the Suranganar RF (Western part of Theni division) of Gudalur Range, which was by then having forest contiguity with Vannathiparai RF of Gudalur Range (eastern side of Theni-Kumily highway) and Periyar Tiger

A view of Periyar Hydroelectric project at Lower camp, Gudalur

Reserve in the south (Management plan 1972). Nevertheless, habitat contiguity between the two RFs (Suranganar and Vannathiparai RFs) has been cutoff by the penstock pipes of the Periyar Hydro Electric Project and elephant movement has been reported to have stopped since 1959, after the construction of the penstock pipeline (Fig. 3). The recent population survey during 2005 by Asian Elephant Research and Conservation Centre also showed no evidence of elephants using the Suranganar RF. Therefore, Theni western forest patch does not have contiguity in the southern side for the elephants to move between Vannathiparai RF and Suranganar RF.

On the other hand, the western forest patch of Theni seems to have forest contiguity with Kodaikanal forest division. But the presence of steep escarpments across the contiguous stretch does not allow elephants to use this corridor. However, our surveys in adjoining Kerala have revealed that elephants from Theni Forest Division have been using level land of private cardamom estates (Kudampara and K.R. Vijaya estates (Fig. 4) traditionally to move into Munnar Forest Division of Kerala and vice versa.

A panoramic view of Ponkundru Hill – The elephant's route to the cultivations in the plains

The specific route was identified using indirect signs such as feeding signs, tracks and dung piles of elephants and also enquiring with the local people. The route tracked using a GPS from Theni Forest Division was ***Sakkulathu mettu, Pathinettam padi*** and ***Ponkundru,*** which ultimately lead to Cardamom Hills RF of Devikulam Range in Munnar Forest Division via the ***Kudampara*** and ***K.R. Vijaya*** cardamom estates and Mathikettan Shola NP

Figure 3. Map showing the corridor between Theni Forest Division and Munnar Forest Division.

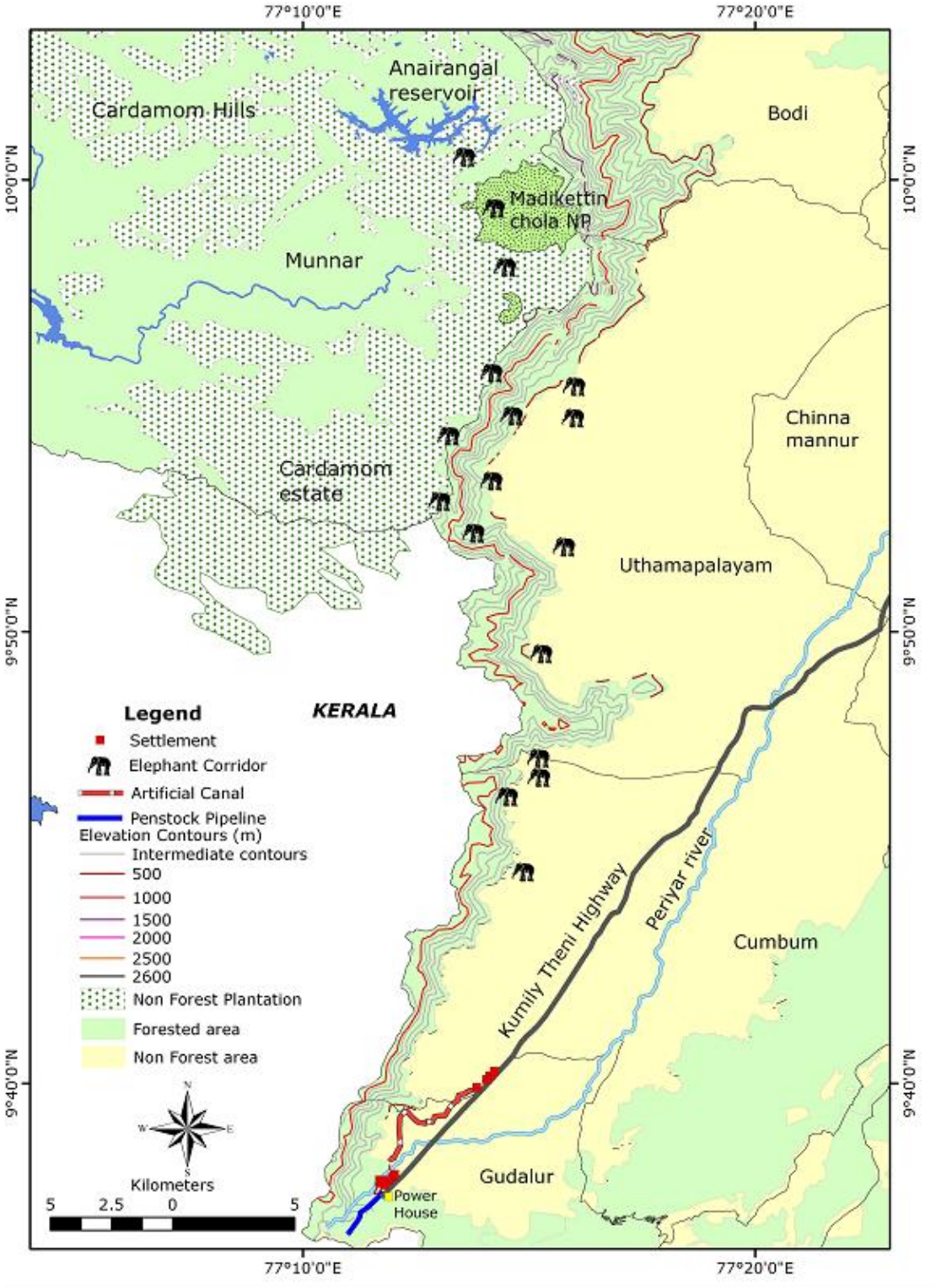
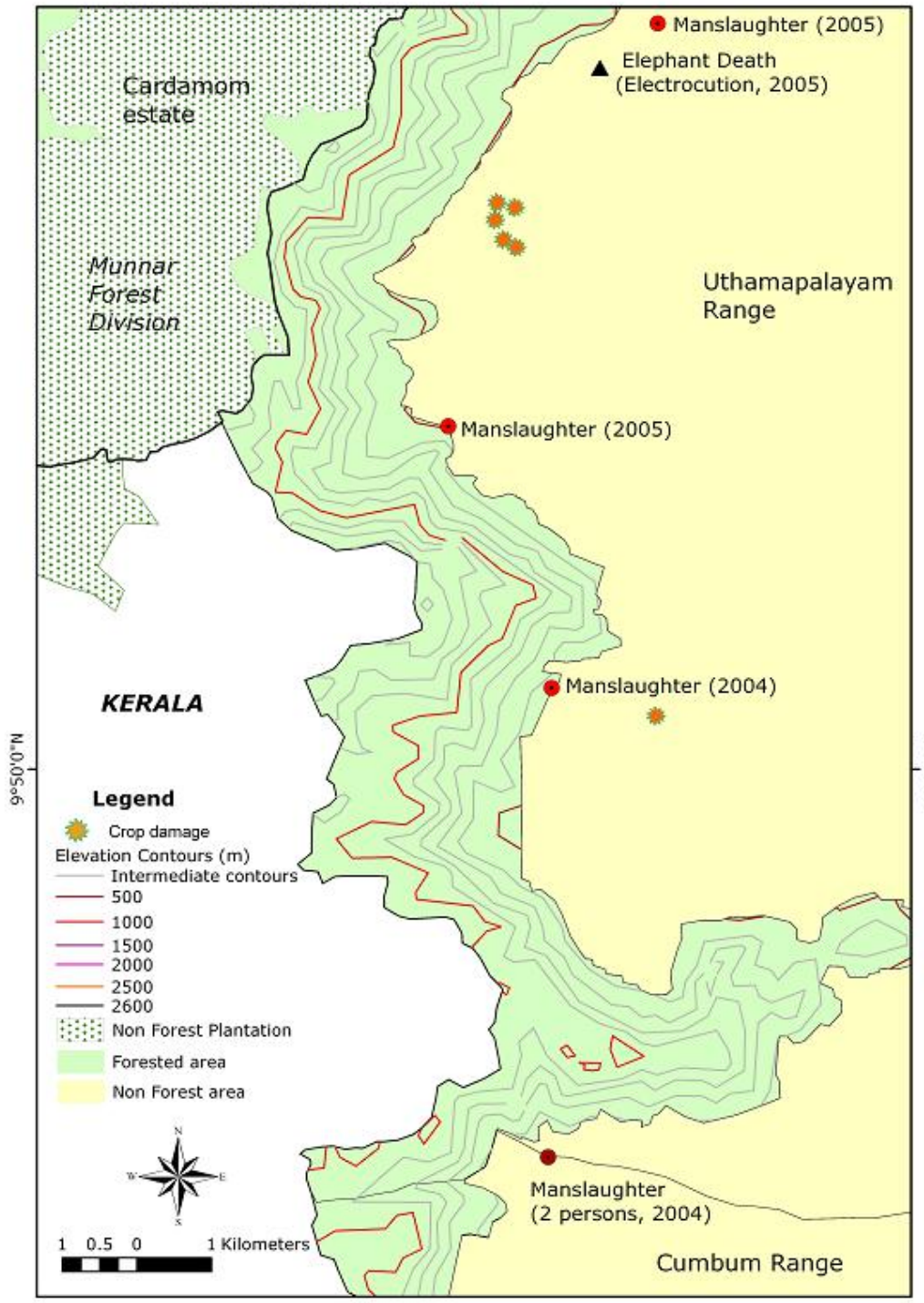


Figure 4. Map showing the human-elephant conflict locations in the Theni Forest Division



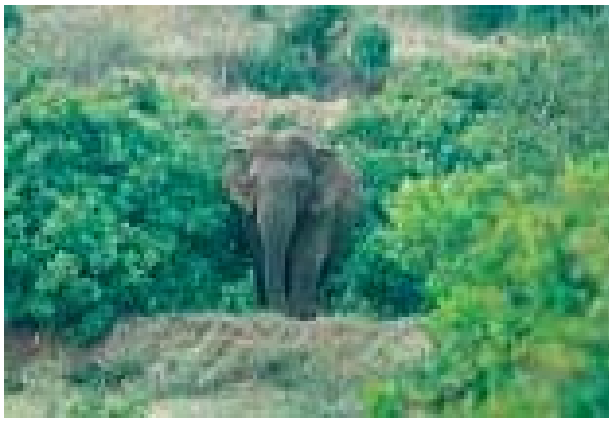
K.R. Vijaya cardamom estate sharing boundary with Theni forest division

(Fig. 3). Such movements by herds and bulls have been reported (by local people) to take place regularly since the area on the Kerala side was brought under cardamom cultivation. In support of the present finding, AERCC earlier in 1998, documented the elephant movements from Munnar Forest Division to half the way up to a place called Anaiyarangal reservoir *via* the Mattupatti elephant corridor crossing Pachakadu and Silent valley tea estates.

As elephants are well known for their wide-ranging habit (range over 500 km^2 in the optimal habitats of southern India) (Baskaran, 1998) and strong fidelity to their home range (Baskaran, 1998; Joshua and Johnsingh, 1995), it is reasonable to accept that the existing 200 km^2 of habitat in Theni Forest Division is only a part of its home. Its remaining home could lie in the Munnar forest division from where they have been ranging to Theni Forest Division traditionally and continue to do so even after the habitat contiguity was lost on the Kerala side due to the cardamom plantations.

Hence, ***elephants using the western part of Theni Forest Division are not isolated within the same patch and are most likely part of the larger population on the northern side of Theni Forest Division***.

Group size and composition:



The *makhna*, a habituated crop raider who has also killed many people, entering the cashew

In order to know the number of elephants using the Theni western forest patch, direct sightings and indirect evidences were used while surveying the area on foot, in Tamil Nadu as well as in the cardamom estates on the Kerala side. In Palayam Range in Theni Forest Division, an adult *Makh*ana was sighted whose height was estimated to be around 10 feet (from 150cm front foot circumference), likely to be around 40-

50 years old. Apart from this, there were reports of two more sub-adults or young adult *Mahkana's*, of which one was electrocuted in 2005 at Kombai of Uthamapalayam range. The other *Makhana* and female herd have not been sighted in the Theni Forest Division. But in the cardamom estates on the Kerala side, eight different dung piles were seen in one resting place and the track from the resting site was leading to the Tamil Nadu side. This was tracked up to the Tamilnadu border to confirm the herd movement to Theni division. Such evidences suggest that the Division is used by a herd of a minimum of four elephants (assuming four elephants defecated two times for a total of eight dung piles recorded in the cardamom estate).

The present survey has revealed that ***at least one herd of 4 –8 individuals and an adult bull using the western part of Theni Forest Division***.

Conflict

Crop damage:

Elephants have been reported to raid crops throughout the year and the most affected crops were Coconut, Sugarcane, Maize, and Mango. Only solitary animals have been reported to be raiding crops regularly, while herds rarely involved in raiding crops in the area. Crop raiding is taking place most frequently in Uthamapalayam range and seasonally in Cumbum Range, especially during Cashew fruiting season (April - May). Places like Aruvatheti parai, Machanaikan oothu, Manikatti Alamaram, Thevaram and Kombai are some of the favourite locations for elephants during the day, as these places have good shade and water availability. People use crackers and shouting to chase elephants from crop fields. However, such techniques have little or no effect especially on habitual raiders. Data available from the Forest Department shows that compensation paid or applied towards crop damage in western side of

Coconut trees destroyed by the elephants in Theni Forest Division

A coconut plantation attacked by the elephants in Theni Forest Division

the division has been increasing gradually from Rs. 13,000/- in 2003 to Rs. 53,000/- in 2005 (Table 1). In 2006, within a couple of months, crops worth 13,000/- was damaged.

Table 1. Details of compensation paid towards crop damage by elephants in Theni Forest Division (Uthamapalayam and Cumbum ranges)

S. No	Year	No. of cases	Compensation (Rs.)
1	2004	7	57357.00
2	2005	16	**53000.00
3	2006*	2	*13000.00

** Applied * Up to February 2006

Manslaughter:

A solitary *Makhana* is believed to be responsible for all the five human casualties in these areas. Uthamapalayam range experienced more manslaughter (Three cases) than Cumbum (two cases). Majority of the victims were males. Most of the accident took place in agricultural fields (Three out of Five) while chasing the elephants from the crop field into the forests. And on two occasions the victims were attacked in the forest while going for firewood collection. Compensation was paid only for the incidents that took place in the non-forest areas.

A woman killed by elephants in Uthamapalayam Range of Theni Forest Division

Table: 2 Human casualties by elephants in Theni Forest Division (Cumbum and Uthamapalayam Ranges)

S. No.	Year	Human casualty	Male	Female	Compensation
1	2001	-	-	-	-
2	2002	-	-	-	-
3	2003	-	-	-	-
4	2004	3	2	1	3,00,000.00
5	2005	2	1	1	1,50,000.00*

*Chief minister relief fund. One case 2005 that took place inside the forest was not compensated

Elephant mortality:

The elephant number in this small stretch (Western part of Theni division) was believed to be about 11, of which one sub adult female died due to natural causes in 2005 at the foothills of Kottamalai. Another sub adult *Makhana*, about 10-12 years old, was electrocuted in a coconut farm near Kombai in 2005, due to an illegal high voltage electric fence.

A sub-adult *makhna* electrocuted due to an illegal electric fence put up by a farmer in Kombai RF of Theni Forest Division

Table: 3. Records of elephant mortality in Theni Forest Division

S.No.	Year	No. of cases	Natural	Poaching	Conflict
1	2001	-	-	-	-
2	2002	-	-	-	-
3	2003	-	-	-	-
4	2004	1	1	-	-
5	2005	1	-	-	1

From the above details, ***it is quite evident that much of the conflict is due to solitary Makhanas, which seem to sustain mostly on cultivated crops. Female herds do not cause much damage to crops. Therefore, any remedy taken to prevent the solitary ones from raiding would curtail the conflict by 70-90%. Management action needs to be taken at least against such chronic crop raiders not only for the benefit of the affected community but also to gain public support for the conservation of the remaining wildlife***.

Resolving human elephant conflict:

***1. Driving elephants*:** There were cases of driving the conflict elephants from the conflict area (fringes) into interior forest within the home range of the elephants or stray elephants from the new location to their earlier habitat. Such measures are only temporary solutions as the same elephant can come back to the conflict location again. As far as Theni conflict is concerned, there are many more hurdles in driving the problem apart from the inherent problem described above and these include

(i) The area where the conflict animals are taking refuge is very hilly and steep and driving conflict elephants in such a hilly terrain is very difficult using the *koonkies*.

(ii) With great difficulty, the elephants can be driven only towards the Kerala area (Munnar Forest Division), which is on the northern side from where they are coming to Theni forest division at present. Driving the elephants across the interstate border through private lands will require lot of legal formalities and is also bound to get public and political attention.

(iii) Though Theni division in the northern side has contiguity with Kodaikanal Forest Division in Tamil Nadu, the elephants cannot be driven through this area due to steep escarpments.

(iv) Driving the elephants to the southern side is also not possible as habitat contiguity is cutoff and driving the elephants to a new area is also not technically correct as they may come back or cause similar problems in the new area too, in which case it will only be transferring the problem from one area to the other.

Considering all these lacunae, driving cannot be used as a measure to reduce or to stop the conflict.

2. Elephant Proof Trench – EPT: EPT is an effective preventive measure to reduce human elephant conflict especially in dry areas (with people's co-operation), like Theni. However, considering the long stretch of area (over 50 km) to be dug up and the cost (approximately Rs. 90,000 to 1,80,000 / km of digging), it would not be possible as only limited funding is available with the government. Even if this is possible, it is not worth pumping such a large sum of money for conserving 10 to 15 elephants, considering there are viable populations or areas presently suffering with minimal conflicts without nominal funding. Diverting such big amounts towards these areas in the right time would not only reduce the conflict level and prevent one more area from becoming a high conflict zone, but will also ensure the long term conservation of such a viable population.

3. Rubble wall*:* Rubble wall in dry belts backed with hedge plants of *Lantana camera* is also a very effective method to reduce crop damage, but for this, crop fields need to be in the upward slope and not in the downward slope. Rubble wall is relatively cheaper compared to EPT (with free availability of rubbles in the RF areas and labour with people's participation). However, since the crop fields in the Theni forest division are in the down slope, efficacy of the rubble wall here against habitual crop raiders like the 10-foot *Makhana* is questionable.

***4. Electric fence*:** Electric fence, although an effective and successful protective measure, would cost (approximately Rs. 25,000 to 2,25,000 / km). Hence, this method is also not worth for Theni Forest Division considering the reasons discussed above in EPT.

***5. Chilly Fence*:** In the recent past African elephant intrusions into crop field have been curtailed by low cost indigenous chilly fence at Masai Mara Ecosystem. Such low cost protective measure could be experimented in Theni Forest Division to know how far such indigenous technique works out especially with habitual crop raiders like what we have in Theni Forest Division.

***6. Capture and Translocation*:** Although there have been few incidences of capture and translocation of habitual raiders from fragmented areas to larger contiguous landscapes, much of the experience has revealed that the translocated individual either ends up in conflict at the fringes of larger landscapes (an adult male translocated from Chithoor areas to Anamalai in 1987 started damaging crops at the fringes) or goes back to its original place (two of the four adult males translocated from Madikeri forest division to Nagarahole National Park returned to Madikeri in Karnataka).

Considering the impact of ivory poaching in a highly skewed sex ratio in some populations and the lower probability of problem elephants settling down as non-problem elephants in the translocated place, translocation could still be considered provided the movement of translocated elephants are monitored using GPS techniques. The state forest department needs to approach Project Elephant's support specifically for such programmes.

***7. Capture and domestication*:** In the absence of a programme for monitoring translocated problem elephants and failure in such attempts (problem elephants translocated continue to cause problem in the translocated areas or return to old areas), the only option left is to capture and domesticate the problem elephants to curtail the conflict by habitual crop raiders as far as Theni Forest Division situation is concerned.

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