Gajah 35 (2011) 87-92

Current Status of Asian Elephants in Nepal

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Introduction

Until the 1950s, much of the plains area of southern Nepal known as the Terai was covered by forests uninhabited by humans due to malaria. It is believed that the elephants in these forests in Nepal and elephants in north and northeast India constituted one contiguous population (DNPWC 2008). The eradication of malaria and government resettlement programs in the 1950s resulted in a rapid influx of people from the hills into the Terai. Besides, thousands of Nepalese residing in Myanmar and India came back to Nepal due to the land reform program in the 1960s (Kansakar 1979). The arrival of settlers meant the destruction of over 80% of the natural habitat (Mishra 1980), which resulted in the fragmentation of wild elephants into partially or completely isolated groups numbering less than 100 animals each (Pradhan 2007).

The Government of Nepal, over the years has been trying to address the conservation of this endangered species through various policy approaches. These include listing of elephants as a protected species in the National Parks and Wildlife Conservation Act 1973 (NPWCA 2029). Preparing Elephant Conservation Action Plans (2008) and more importantly, adopting the Terai Arc landscape level conservation program. This program aims to manage the elephants as a meta-population through restoration of corridors, thus improving their chances of long-term survival in their current habitats (DNPWC 2008). The Nepalese government has also recognized the importance of captive elephants by establishing an elephant breeding facility at the Chitwan National Park.

Wild elephants

Population distribution

Presently, the number of resident wild Asian elephants in Nepal is estimated to be between 109 and 142 animals (DNPWC 2008). They occur in four isolated populations (Eastern, Central, Western and far-western). The area inhabited by elephants is spread over 135 village development committees (VDC) in 19 districts (17 in lowland Terai and 2 in the hills) of Nepal, covering about 10,982 km^2 of forest area (DNPWC 2008). This widespread and fragmented distribution of elephants in the Terai underscores the importance of the need for landscape level conservation planning as a strategy to protect elephants and humans by maintaining forest corridors within the country (Fig. 1). In addition, in recent years there have been several incursions of over 100 elephants from the Indian state of West Bengal into Eastern Nepal.

The eastern population comprises of about 15 resident animals and migratory animals from West Bengal with herd sizes ranging from a few individuals to over 100 animals (Yadav 2002; DNPWC 2008). The resident elephants move seasonally through the seven eastern districts covering 2228 km^2 of forest area. This elephant population is confined to highly degraded and fragmented forest patches which in turn lead to very high conflict with humans. Koshi Tappu Wildlife Reserve, the only protected area in the east, is tiny with 4.59 km^2. forest. The movement of the trans-boundary herd is largely restricted to the Bahundangi area of Jhapa district and creates massive human elephant conflict. (DNPWC 2008). In November 2007, 175 elephants

including 37 calves entered Jhapa but were not reported to move beyond the boundaries of Jhapa district. It is suspected that this herd, which lives in a highly disturbed and fragmented landscape on both sides of the border ranges from Assam to Eastern Nepal through the Indian state of West Bengal.

In central Nepal (Fig. 1), it is estimated that a population of 25 to 30 elephants are largely resident within the Parsa Wildlife Reserve and Chitwan National Park (ten Velde 1997; DNPWC 2008). Occasionally these elephants move towards Mahhotarri district in the east. The elephant population is estimated to occur over a forest area of 3227 km^2. Forest habitats and corridors are mainly intact except for a few settlements in the Bara, Rautahat and Mahhotarri district (DNPWC 2008).

The western elephant population is mainly found in Bardia National Park and ranges over a forest area of 2943 km^2 spread over 36 VDCs in 3 districts (Fig. 1). This is the elephant population that has been studied the most and its origins are very interesting. Prior to 1994, there were only 2 resident elephants and a seasonally migratory herd of 12 elephants in the park (Pradhan *et al*. 2007, 2008). Elephant numbers then started to increase, probably due to immigration from India. In 1994 rangers in Bardia NP counted 45 animals. Pradhan (2007) carried out the first systematic sampling for elephant numbers using non-invasive genetic microsatellite techniques. He estimated 50 elephants in the Karnali floodplain and over 30 in two separate herds in the Babai Valley, a total of 80 animals within Bardia NP. He also found that females and calves had high kinship coefficients indicating mother-offspring relationships and the overall population genetic variability was moderately low (ca. 60% heterozygosity) when compared with US zoo animals (80%). This can be explained by a limited number of founders from one single population in 1994. In contrast, most of the sub-adult males were not related, either among themselves or with the adult females suggesting non-random locational dispersal (Pradhan 2007). This also indicates that the Khata (Nepal) - Katarniaghat (India) corridor is functional and landscape level biodiversity management benefits elephants.

The elephants in the far western population range over an area of 2583 km^2 of forests, mainly in churia foot hills of Nepal, which includes Suklaphanta Wildlife Reserve and 28 VDCs in 2 districts (Fig. 1). It is believed that 3 – 5 elephants permanently reside inside Nepal while the rest migrate seasonally from the bordering districts in the Indian state of Uttar Pradesh. These elephants

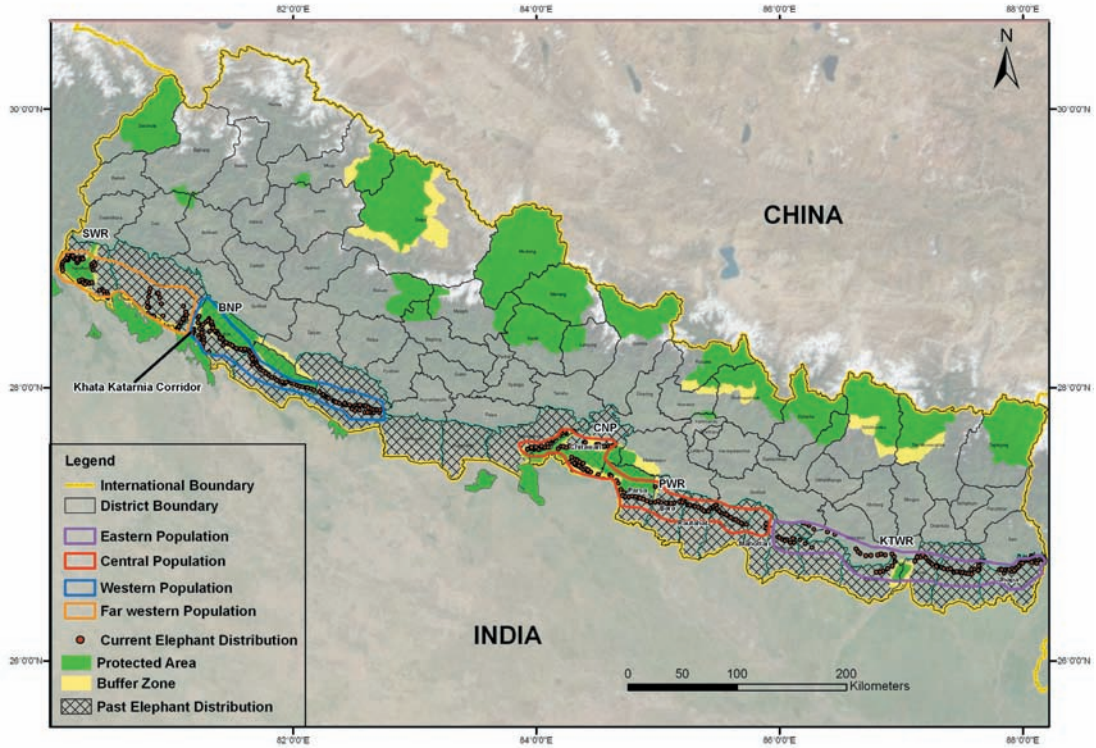

Figure 1. Past (coloured lines) and current (dots) elephant distribution in Nepal.

are believed to be part of a population of 1500 elephants in the Indian states of Uttarakhand and Uttar Pradesh (Rangarajan *et al*. 2010).

Threats

Elephant range in Nepal is under constant threat of being fragmented into smaller areas (DNPWC 2008). Most of the forest corridors in eastern Nepal are highly fragmented. The situation is slightly better in western Nepal where there is connectivity between forests along the north-south direction (Bardia National Park - Katarnia, Basanta-Dudhwa) and along the east-west direction a narrow band – the Churia foothill forest connects Bardia National Park to the Suklaphanta Wildlife Reserve and further west to the forests of the Uttarakhand state in India. These forest corridors have proven to be the vital link for migrating elephants, as they move back and forth between the Indo-Nepal transboundary areas in the west (ten Velde 1997). However, the future of these corridors is uncertain due to the increasing human population. Forests outside the protected areas have suffered extensive depletion, due to the demands of human populations living along the fringe of the forest.

HEC in Nepal

The major cause for increasing human elephant conflict (HEC) is the increasing fragmentation of remaining forests and rapid increases in the elephant population due to migration from India. Moreover, the fertile Terai with intensive agriculture next to the existing elephant habitat is proving to be a fatal attraction to elephants. Inefficiency of the current protection measures, and behavioural flexibility of elephants enabling them to quickly modify their foraging strategies in response to protective measures are also believed to be major reasons for increasing HEC.

The growing human population, coupled with the declining forest area, is bringing people and wildlife into closer contact, with detrimental impacts on both. Therefore addressing the vulnerabilities to communities from large mega herbivores like elephants is one of the greatest conservation challenges faced by the country. Crop raiding and more recently human casualties have become major issues related to HEC.

Among crops, paddy is the most raided crop in Nepal. A study conducted by Shrestha *et al*. (2007) on the Jhapa, Bardia and Sukla areas showed strong correlation between economic loss due to crop damage with settlement coverage (i.e. percentage of the transformed land) and with the degree of fragmentation. Two peak seasons for crop raiding were identified, one during maize or wheat maturing time (June – July) and other during paddy maturing time (Sep. – Nov.). Most of the crop raiding and property damage by elephants were reported to occur at night.

Eastern Nepal is the most affected area by HEC due to the seasonal migration of elephants from India. An average household in Jhapa district lost USD 430 (Nrs. 30,000) to elephants. In a period of five years (2003 to 2007) 20 people have died due to elephant attacks and in retaliation 12 elephants were killed in 2006 (DNPWC 2008).

HEC is comparatively less in Central Nepal as the small elephant population largely remains within the protected areas i.e. Parsa Wildlife Reserve and Chitwan National Park. However, data shows that three elephants were killed during the period of 2005 to 2007. Recently human casualties have been increasing with 11 people dead due to elephants in and around CNP and PWR in the last 10 months (Rupak Maharjan, Park Ranger, pers. comm.). The reasons for this sudden spike are not known.

Similarly, the trend in the number of HEC incidents in western Terai is on the rise. In 1999 alone 117 houses were damaged. Only 2 persons had been killed and 4 injured in the 1980s (Bhatta 2003) as a result of HEC. However in the last four years 10 persons have died, 33 injured and 900 houses damaged due to HEC. Retaliation has not been as severe as in the east; only two elephants were killed in retaliation (by electrocution) in western Nepal to date. Studies by Yonzon *et al*. (2003) in far western Nepal showed that HEC was widespread and occurred over an area of 893 km^2 covering 17 VDCs of Kanchanpur district and 32 VDCs of Kailali district.

Unlike other South Asian countries, retaliatory killing of elephants has not yet reached a critical level in Nepal, except for the killing of 6 elephants in the east in 2006. However, future occurrence of retaliatory killing cannot be ruled out as people's patience with repeated losses due to HEC runs out. There is also a clear indication that for the long-term survival of a species like the Asian elephant in Nepal, mitigation activities have to percolate to the household level even if the conservation approach adopted is landscape level or is community based (Bhatta 2003).

The Government of Nepal with the help of WWF Nepal Program initiated the Terai Arc Landscape Program with the vision of maintaining ecological integrity and bringing livelihood security to the people who live in the landscape. The TAL Program is a priority program of the Government of Nepal and has been included in the 10th Plan. Root Causes Analysis of Terai Arc Landscape outlines human-wildlife conflict as one of the direct causes of biodiversity loss and environment degradation (WWF Nepal 2003).

Despite the severity of the problem of human-elephant conflict in Nepal, there is no national level strategy document to guide mitigation measures in different parts of the country except the new relief fund guideline endorsed by the Government in 2010. Most mitigation measures in Nepal are reactive and implemented to control the crisis situation that develops after a major conflict incident.

At the site level, some of the initiatives that are being implemented to minimize HEC caused by human casualties and damage of property are:

Physical barriers: These include wildlife watchtowers, trenches, fences; deterring devices and also promotion of traditional methods used by the local community.

Power fences: Electric fences were first piloted in Bardia National Park and Suklaphanta Wildlife Reserve in 2000. However fence equipment was stolen and its effectiveness could not be assessed. The main lesson learnt from this piloting was that, community ownership is mandatory for these measures to be sustainable. Since then the Government of Nepal is working with local community based organization in erecting electric fences and this seems to be one of the effective tools to minimize HEC, but still maintenance is a major challenge for sustainability.

Local practices: Most common local practices used in affected villages are: fire, noise, domestic elephants, firecrackers and deterring squads of humans and elephants.

Relief schemes: In order to compensate local communities and to ensure their participation in conservation, the Government of Nepal endorsed a relief fund policy for wildlife victims in 2010. This policy provisioned about USD 2000 (NRs 150,000) for human death and up to USD 715 (NRs 50,000) for injuries due to wild animals. Besides, some protected areas (Chitwan National Park, Bardia National Park) have access to emergency funds, which provides immediate relief to people attacked by wildlife.

Buffer zone development program: The National Park and Wildlife Conservation Act 1973 mandated that 30 to 50 % of the income derived by national parks and wildlife reserves has to be plowed back to local buffer zones around protected areas. The main objective of this program is to make the local people guardians and supporters of conservation. The money is spent through local Buffer Zone Users Committees in various activities related to conservation, community development, conservation awareness and income generation activities.

Elephant drives: This method has been piloted in the Madi Valley of Chitwan National Park. A central level squad with park personnel, security people and kunki elephants has been formed to react immediately and provide relief from raiding elephants at the problem site. Informants were recruited at the village level, through VCDs, to inform the movement of elephants to park HQ as well as to local people as an early warning system. User group committee level squads have also been established to assist the central level team when it is in action.

Elephant Conservation Action Plan for Nepal

Recognizing threats in conserving elephants, the Government of Nepal endorsed "The Elephant Conservation Action Plan 2008", a guiding document that identifies the highest priority conservation actions for overall management of the elephant in Nepal. The plan aims to save the elephants in the wild from extinction, immediately address habitat loss and to mitigate associated people-elephant conflict. Therefore the action plan mainly focuses on crisis management as the population is already fragmented, and resolving human elephant conflict. The plan emphasizes landscape level conservation and creating/maintaining ecological corridors, so that fragmented elephant populations can be linked for genetic viability. Besides, it also emphasizes management of captive elephants in Nepal.

Captive elephants

Domestication of elephants in Nepal has a long history. Prithivi Narayan Shah, the first king of the Shah Dynasty provided seven adult elephants annually from 1743 to 1775 to the East India Company for invading Parsa-Mahotari through the Makawanpur Battle (JBK 1985). Likewise, it has been recorded that 315 elephants were used by a Rana ruler in a single hunt in Chitwan Valley in 1930. In the past, there used to be 31 elephant camps throughout the lowlands of Nepal. The capture and training of wild elephants was a common practice. A total of 10 wild elephants were captured for domestication during 1954-1970. However, data shows the number of domesticated elephants was decreasing in trend up till 1970s (Fig. 2).

Since 1978, management responsibility of domesticated elephants has been given to the Department of National Parks and Wildlife Conservation (DNPWC). Due to the increasing demand for elephants for patrolling and park management duties and the difficulty of legally procuring elephants from India, an elephant breeding center was established in CNP in 1986.

At present, there are altogether 208 captive elephants in Nepal (Table 1, Source: DNPWC, CNP, NTNC) out of which 94 government elephants are in various PAs in the Terai, namely Koshi Tappu Wildlife Reserve, Parsa Wildlife Reserve, Chitwan National Park, Bardia National Park and Suklaphanta Wildlife Reserve. The National Trust for Nature Conservation (NTNC), a national NGO possesses 8 elephants in their field station in Chitwan, Bardia and Central Zoo, Kathmandu. The majority of private elephants are in and around Chitwan National Park, and are mainly used for tourism purposes. Government elephants are mainly used for patrolling and research purposes whereas private elephants are mostly used for forest excursions and for entertaining tourists in buffer zones of parks and reserves.

Elephant tuberculosis is a chronic disease that affects captive elephants worldwide. In Nepal tuberculosis in captive elephants was first identified in Chitwan National Park in 2002 (Gairhe 2002). In the period of seven years (2002-2009) altogether seven captive elephants died due to tuberculosis (DNPWC 2011). To address this the Government of Nepal started surveillance on elephant Tuberculosis in 2006 and started TB treatment in 2008 by standardizing treatment protocol. Recently the Government of Nepal endorsed the Nepal Elephant Tuberculosis Control and Management Action Plan, which aims to minimize the risk of TB transmission from captive elephants to the wild by managing tuberculosis at the captive-wild interface (DNPWC 2011).

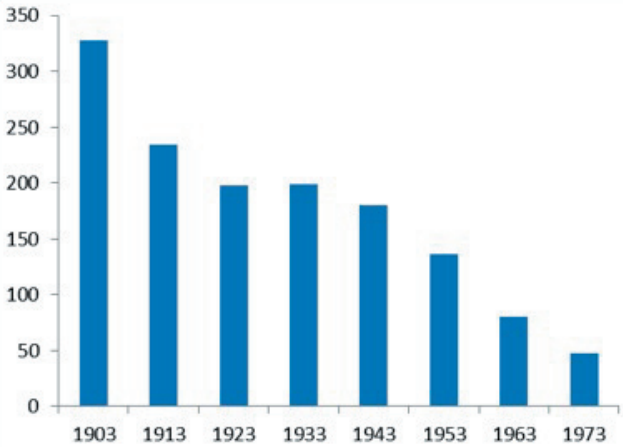

Figure 2. Captive elephant population over time.

Table 1. Domesticated elephants in Nepal.*

	Gov.	NTNC	Private	Total
Chitwan NP	52	5	98	155
Bardia NP	16	2	8	26
Parsa W	10			10
Koshi Tappu W	8			8
Suklaphanta W	8			8
Central Zoo		1		1
Total	94	8	106	208

*NP=National Park, W=Wildlife Reserve, Gov. =Government

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