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Caption: *Cyrtodactylus myntkyawthurai*, endemic to Myanmar. Medium: Water colours on watercolor sheet. © Aakanksha Komanduri



Revival of Eastern Swamp Deer *Rucervus duvaucelii ranjitsinhi* (Groves, 1982) in Manas National Park of Assam, India

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Abstract: A healthy population of the threatened Eastern Swamp Deer *Rucervus duvaucelii ranjitsinhi* in Manas National Park was almost exterminated due to politico-ethnic disturbances in the late 1980s that culminated with the formation of Bodoland Territorial Council in 2003. The Swamp Deer population in Manas began to revive with augmentation starting in 2014, in keeping with a UNESCO World Heritage Site Committee mandate. The Eastern Swamp Deer population in Kaziranga was threatened by the annual flood of the Brahmaputra River, and to secure the future of this threatened species, 36 deer were relocated in two batches in 2014 and 2017 from Kaziranga to Manas. The population of Manas had grown to an estimated 121 individuals by March 2021. Swamp deer is considered an important prey species for Swamp Deer population top predators, especially tigers, which have also increased in number in Manas over the last decade. Thus the revival of Eastern Swamp Deer has contributed to the rewilding programme of the Manas landscape.

Keywords: Conservation, Manas landscape, population, rewilding, Swamp Deer, Tiger prey, translocation.

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Author contributions: NI—data generation, data analysis, images, writing the manuscript. AA—data generation, data analysis, writing the manuscript. RB—conception, design, editing/correcting manuscript. SD—editing/correcting manuscript. BC—editing/correcting manuscript. PKS—editing/correcting manuscript. JD—data generation.

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INTRODUCTION

Swamp Deer *Rucervus duvaucelii* (Cuvier, 1823), also called Barasingha, is an ungulate endemic to the region of Indian sub-continent. On the basis of morphological and geographical variations, three subspecies have been described: Western Swamp Deer *Rucervus duvaucelii duvaucelii* (Cuvier, 1823) confined to the terai grasslands in northern India and southwestern Nepal; Hard-ground Barasingha *R. d. branderi* (Pocock, 1943) restricted to Madhya Pradesh, and Eastern Swamp Deer *R. d. ranjitsinhi* (Groves, 1982) found in the Brahmaputra valley of Assam (Schaller 1967; Groves 1982; Gopal 1992; WII 2017). Swamp Deer underwent a considerable decline in the closing decades of the 20th century, due to large scale poaching and alteration of preferred habitats (Singh 1970; Sankaran 1990; Qureshi et al. 2004; Ahmed & Khan 2008; Saikia et al. 2012; Goswami & Ganesh 2014). The species is assessed as 'Vulnerable' in the IUCN Red List of Threatened Species, and listed in the Schedule-I of the Indian Wildlife (Protection) Act, 1972 (Duckworth et al. 2015).

Eastern Swamp Deer (ESD) in Assam

Historically, Eastern Swamp Deer were abundant in Assam, inhabiting the river islands or 'char' areas of the Brahmaputra floodplains and extending down to the eastern Sundarbans (Jerdon 1867). A large number of individuals resided in the undivided Goalpara, Kamrup, Nagaon, Sibsagar, and Darrang districts of Assam (Bhadian 1934). The ESD were found in the flat alluvial plains covered with tall grasses in the Brahmaputra valley, and in the terai grasslands of flat to moderately hilly terrain, especially in the Manas landscape in the southern foothills of Bhutan (Schaller 1967). The only known concentrated population of this subspecies was located in Kaziranga National Park (Lahan & Sonowal 1973), and by the 1980s there were only two known populations remaining in Assam, in Kaziranga and Manas.

The Kaziranga population was affected by the annual floods of the Brahmaputra. This was amply demonstrated during two major floods during 2012, when the ESD population showed a sharp decline with the loss of about 23% of the total population. The total population of ESD in Kaziranga has been hovering around 1,000 individuals. On the other hand, a healthy population of ESD with more than 500 individuals occurred in the terai grassland of Manas National Park in 1987 prior to the civil unrest (DebRoy 1991; Choudhury 1997). During the unrest period, this threatened species was almost

exterminated from the landscape (Saikia et al. 2012; Borah et al. 2013; Goswami & Ganesh 2014).

Manas National Park

Manas National Park is administratively located in the Baksa and Chirang districts of Bodoland Territorial Area Districts (BTAD) in western Assam. It spans a region from latitude 26.623–26.822 N to longitude 90.808–91.251 E in the southern foothills of the eastern Himalaya (Figure 1). This area falls within the Burma monsoon forests on the borders between the Indo-Gangetic, Indo-Malayan, and Indo-Chinese bio-geographical realms, and is part of Brahmaputra Valley Bio-geographic Province with Assam valley semi-evergreen forests and terai-duar wet alluvial savanna grasslands (Champion & Seth 1968). Manas is recognized for its spectacular scenic beauty with a variety of habitat types in the Bhabar-Terai belt that support diverse wildlife including rare and globally threatened species, making it one of the richest of Indian wildlife areas.

The diverse habitats of Manas National Park harbour the largest number (n= 22) of threatened mammalian fauna which are listed in the Schedule-I of the Wildlife (Protection) Act, 1972 (Lahkar 2008). Apart from being a national park, a part of Manas (Wildlife Sanctuary) was listed as a World Natural Heritage Site in 1985. It is also a tiger reserve, an elephant reserve, and a biosphere reserve.

Conservation of ESD in Manas

The politico-ethnic disturbances in the 1990s decimated most animal populations in Manas, including the ESD. After the return of normalcy, indirect evidence including irregular sightings of ESD occurred in Manas National Park, but photographic evidence could be obtained only during the tiger estimation (Das et al. 2009; Sharma et al. 2012). This photographic evidence proved the continued existence of a small population (estimated <20 individuals) of this threatened species in Manas National Park.

After the Bodo strife, the only viable population of eastern swamp deer existed in Kaziranga National Park. Hence, there was an urgent need to build up a second home for this species. Manas was the natural choice because of its history of having the species, and because protection mechanisms had improved. A translocation programme was developed at the recommendation of the UNESCO World Heritage Site Committee by Assam Forest Department in collaboration with Wildlife Trust of India-WTI and other partner organizations as a part of the recovery of this threatened species

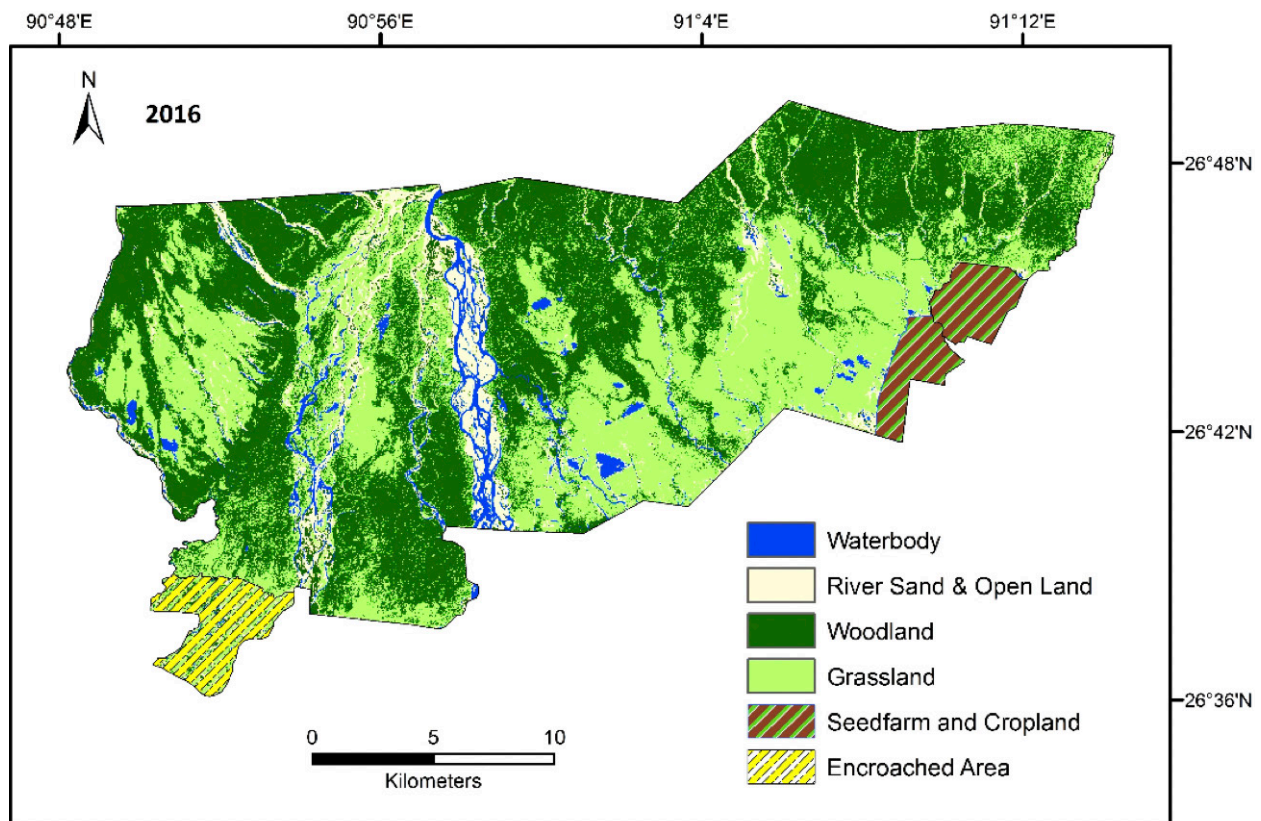


Figure 1. LULC Map of Manas National Park, Assam. © Dr. Dhritiman Das.

in Manas National Park (UNESCO 2016). Under this programme, 36 individuals of ESD in two batches of 19 and 17 individuals were captured from Kaziranga and translocated to Manas in December 2014 and February 2017 respectively (Ahmed et al. 2016; WTI 2018). The translocated ESD were kept in a predator proof enclosure within the Manas National Park for a few months before their release into the wild.

CONSERVATION RESULTS

Monitoring trends in distribution and abundance is vital to evaluate the success of any conservation objective. We monitored the ESD populations regularly post release in Manas. This activity was conducted once in a year after grasses had been burnt to aid sighting and after the calves had been dropped, usually in March or April. We used a block count method (Maruyama & Nakama 1983; Herrero et al. 2011), where counts were repeated over three mornings consecutively to obtain a mean value that was taken as the absolute number of estimation.

Between release and March 2021, the number of

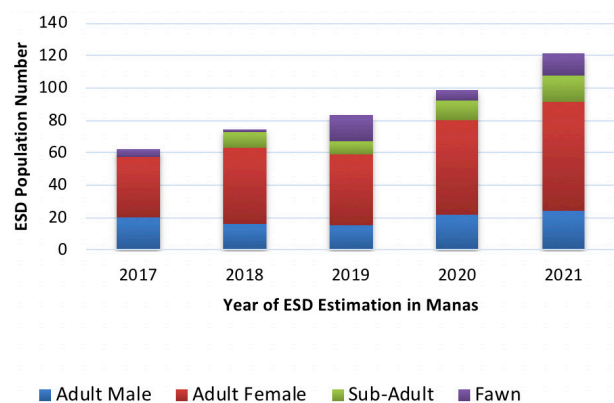


Figure 2. Population growth trend of Eastern Swamp Deer in Manas National Park.

ESD estimated in Manas National Park has more than doubled, with increases in all age and sex classes (Figure 2). A total of 121 individuals, consisting of 24 adult males (20%), 67 adult females (55%), 17 subadults (14%), and 13 fawns (11%) were recorded. The presence of five ESD individuals (2 males & 3 females) were also confirmed through direct sighting in the Sidajhar grassland under the Kahitama Beat, on the west of Beki of Manas National

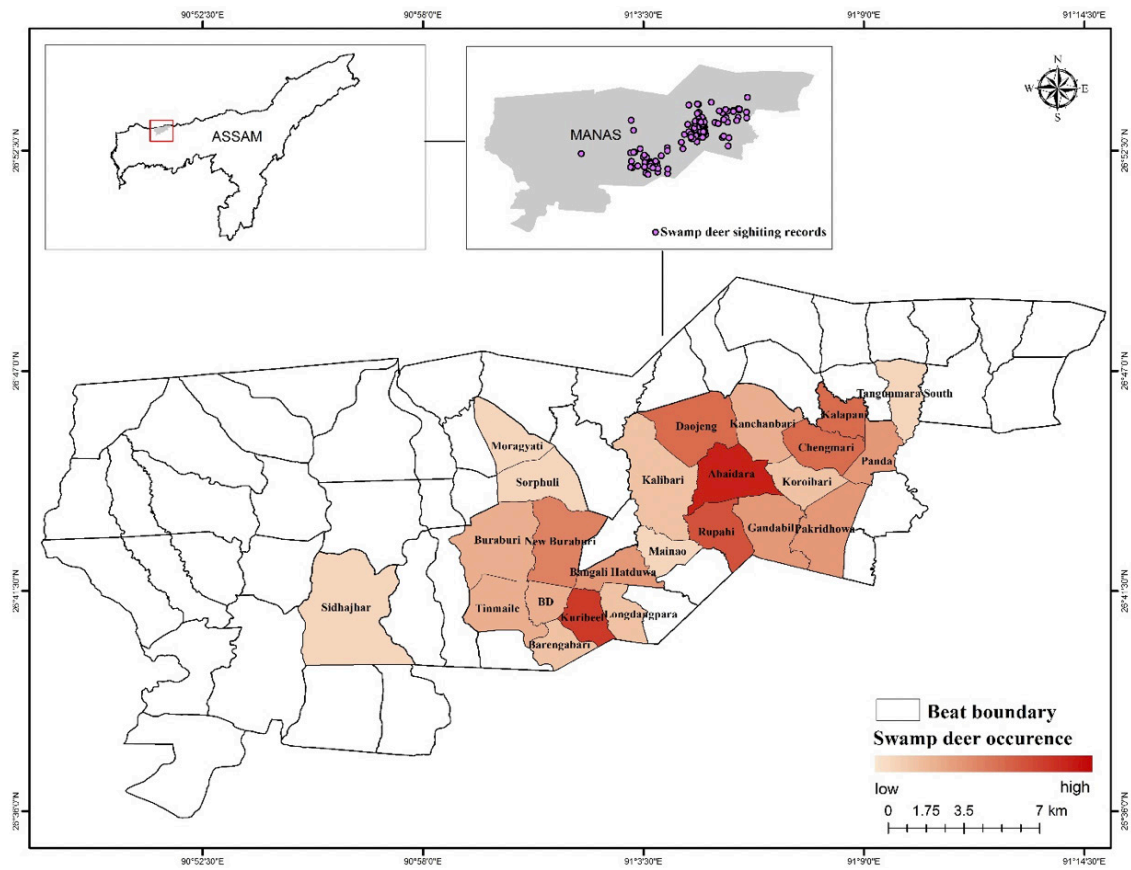


Figure 3. Occurrence of Eastern Swamp Deer in different blocks of Manas National Park.

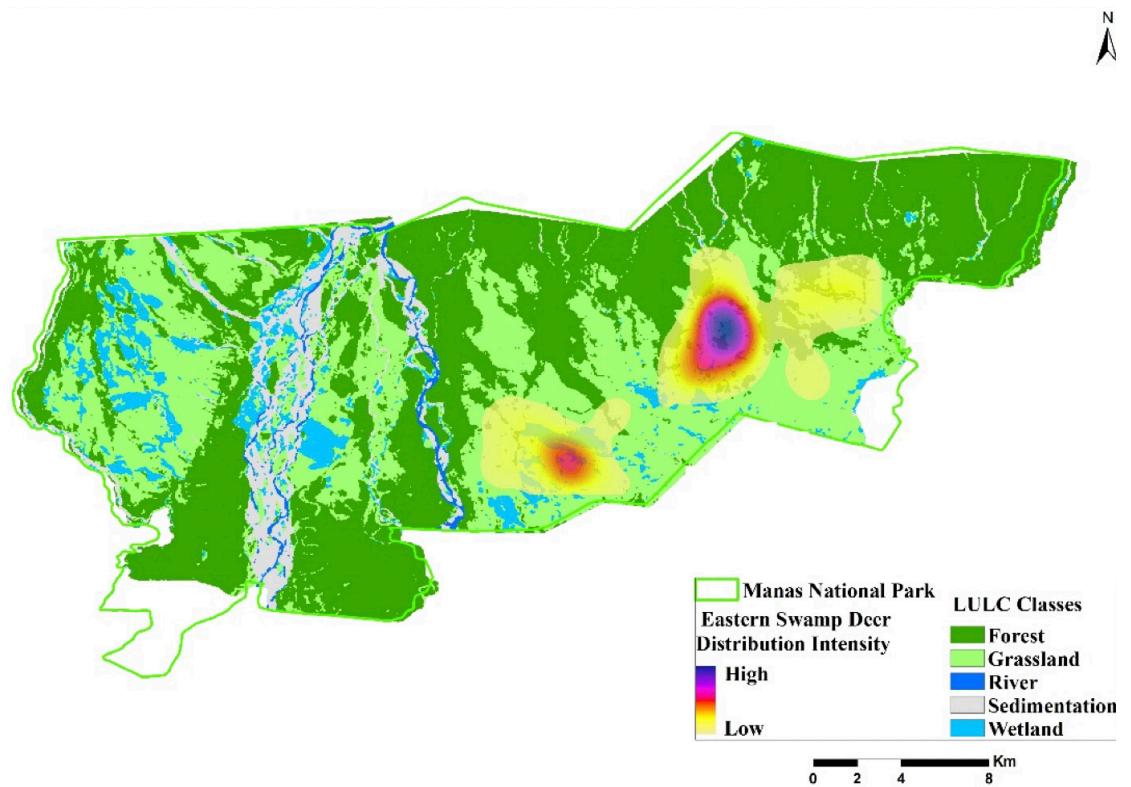


Figure 4. Distribution Intensity of Eastern Swamp Deer in Manas National Park.

Park (Figure 3). Being a grassland dwelling species, major herds were found mostly in the wet alluvial grassland habitats in Kuribeel and its surrounding areas under Bansbari range and Rupohi-Kanchanbari-Abwidara area under Bhuyanpara range of Manas (Figure 4).

DISCUSSION

The annual population estimation has revealed that the ESD population is increasing in Manas National Park. Deer have been recorded from different wet-alluvial grassland patches and swampy habitats of the park, indicating that translocated groups have suitably adapted in the wild, dispersed and occupied different grassland habitats. Remnant populations of eastern swamp deer also appear to have revived with strengthening of their protection. Translocation of animals to recover populations and reduce the risk of extinction has made significant differences to the conservation status of many species worldwide (Berger-Tal et al. 2019). Supplementation of the eastern swamp deer population with individuals from Kaziranga has had a positive effect on the recovery of the resident population, helping to rescue it from the brink of extinction (Ahmed et al. 2016). Further relocations from Kaziranga to Manas may also be effective.

Eastern Swamp Deer is considered an important prey species for top predators, especially tigers, which have also flourished recently in Manas. The 12th annual camera trap assessment by the National Tiger Conservation Authority-NTCA revealed a total of 48 individuals, with 38 adults, three subadults, and seven cubs. This represents a three-fold rise in adult tigers over a decade in Manas, a record for tiger conservation in India.

CONCLUSION

The Eastern Swamp Deer has recovered from near-extinction in Manas National Park, where populations have dispersed to several different areas. There is potential for further growth with the aid of scientific and managerial inputs to strict protection and restoration of suitable habitats. The recovery of this population of a major tiger prey species has vindicated the holistic ecological approach of Project Tiger in India.

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Image 1. Eastern Swamp Deer in Manas National Park. © Nazrul Islam/IFAW-WTI

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