ICASS POLICY BRIEF



Approximate elephant range inferred from historical literature (red), overlaid on present-day protected areas (green) for context.

Managing the expansion of elephant populations in Madhya Pradesh

BACKGROUND

Elephants were extirpated from large parts of Central India, particularly from Madhya Pradesh (MP), over the past few centuries. However, there has been an increasing trend of elephant presence in the state in the last decade, and some areas now have yearround elephant occupancy.

The return of elephants to MP may bolster the conservation of this globally endangered species as well as lead to wider benefits for co-occurring species and habitat. Elephants are 'ecosystem engineers' that disperse seeds, influence vegetation diversity, and create favourable microhabitats for other species through their actions on vegetation and soil. They are also a 'flagship species' whose popularity can mobilise significant finance and technical support for large-scale habitat conservation or restoration.

However, these conservation gains will be undermined if they are accompanied by conflict with people, resulting in crop loss, property damage, and human casualties. Given the early stage of the recolonisation process, MP has an opportunity to plan and implement policies for the co-existence of people and elephants. The Nature Conservancy (TNC) supported a series of scoping studies and a Working Group¹ towards the long-term goal of promoting human-elephant co-existence in MP, including:

- Detailing of historical patterns of elephant presence and extinction within the state.
- Preliminary estimation of how much habitat is potentially suitable for elephants.
- Assessment of local stakeholder perceptions in areas where elephants are currently found.
- A field pilot of an innovative fence design for a village experiencing high human-elephant conflict.

KEY INSIGHTS

1. Elephants occurred widely across Madhya Pradesh until the medieval period, following which they rapidly declined and disappeared by the early 20th Century².

Elephants were present across large areas of Central India around 2,000 years ago, although their population size is unclear. The *Arthashastra* documents five *gajavanas* or elephant-bearing forests that intersected the present-day MP. During

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¹ Comprised of Prof. R. Sukumar and Mr Chitranjan Tyagi, IFS (Retd.)

² Based on a study of historical patterns of elephants in MP conducted by Mr Raza Kazmi.

the 16th and 17th Centuries, elephants were present across MP including the northern parts (e.g., Gwalior and Shivpuri districts), along the western border (Panchmahal hills), and southern parts (including Burhanpur and Betul). During this period, elephants were regularly captured from the wild.

By the time the British gained control of Central India in the mid-19th Century, elephant populations had been limited to the forests of eastern and northeastern MP. Within the state, elephant presence was recorded only from the princely state of Rewah (Singrauli, Sidhi, Rewa, Umaria and Shahdol districts) and Seoni, Jabalpur, Katni, Mandla, Dindori and Balaghat districts. The continuation of elephant capture during the colonial period (particularly after the constitution of the British Central Provinces in 1861) led to their complete extirpation from MP by the first decade of the 20th Century.

2. Habitat conditions in up to 26,000 km² of land may potentially support at least occasional elephant presence, although the potential area for viable populations is likely to be lesser³.

Based on the habitat conditions in areas where elephants are currently found in MP, and the existing scientific knowledge on the habitat characteristics that favour elephant presence, a series of habitat variables were evaluated using remotely-sensed data. These include physical variables such as terrain ruggedness, environmental variables such as vegetative biomass, and human-related variables such as population density. The potential for elephant presence was higher in areas with greater



Regions with potential to support elephant presence in Madhya Pradesh.

vegetative biomass; relatively low levels of human presence; intermediate values of terrain ruggedness; and higher levels of annual precipitation. Around 26,000 km² of land in MP lies within the upper 10% of habitat suitability for elephants. This is, however, a preliminary estimate (based on desk research using remotely-sensed data), and should be considered only as the starting point for a more robust estimation that includes detailed field evaluation.

3. Key stakeholders living in areas with current elephant presence are open to sharing the landscape if their lives and livelihoods are secured.

Interactions with local communities living in areas of current elephant presence revealed a deep respect for elephants as part of the natural fauna of the landscape. They emphasised the need for quick



³ Based on an analysis of habitat suitability conducted by Dr Neha Awasthi.

and effective ex-gratia payments in case of conflict incidents, while also noting that conflict with chital, wild pigs, and monkeys is currently higher than with elephants (although conflicts with the latter can be fatal). A standardised system for advance warning from the Forest Department, when elephants venture near villages, is an earnest request from the communities.

Frontline staff from the Forest Department echoed the need for rapid payment of ex-gratia (including for non-patta lands). They also noted the need for material support that will improve their day-today effectiveness, as well as a long-term strategy for managing elephants. They noted the need for training and honorariums to *Hathi Mitras* (friends of elephants) in villages, and physical protection (e.g., *pucca* houses) for communities as well as staff living in vulnerable locations.





Consultations with communities in areas where elephants have recently moved in to.

Elected representatives from the area also stressed the importance of rapid compensation and physical protection (including for those living in remote areas). They also noted the importance of fine-tuning the strategies, rules, and response mechanisms on conflict management with all stakeholders. Further, the finalised approaches require clear communication to people and elected representatives to be effective.

KEY FUTURE NEEDS

The overall approach towards managing the expansion of elephant populations in Madhya Pradesh has been outlined by the Core Committee on Mitigation of Human-Elephant Conflict in the State of Madhya Pradesh, as well as the Standard Operating Procedure for Human-Elephant Conflict. Building on these frameworks, a set of four strategic work components can help refine the policy initiatives related to managing the expansion of elephants in MP. These include: (i) ecological analysis, (ii) socio-economic analysis, (iii) cost-benefit analysis, and (iv) demonstrations of on-ground management of human-elephant conflict.

These analyses will help in answering crucial questions such as: Where should elephants be allowed to disperse into, and where not? What key management systems need to be put in place to promote co-existence in areas re-occupied by elephants? How much financing will be needed for this, and what will be the sources?

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CASE STUDY

COMBINING A ROBUST FENCE DESIGN WITH A DETERRENCE AND EARLY WARNING SYSTEM

Solar-powered fencing is commonly used for protection in areas experiencing high human-elephant conflict. Such fences can be effective when maintained well and integrated within a holistic framework of conflict mitigation mechanisms. However, solar-powered fencing is expensive (typically ₹2-2.5 lakh/km), and elephants sometimes break through them. If such breaks are not repaired, the overall integrity of the fencing system fails.

To improve the effectiveness of fencing, designs need to (i) reduce the likelihood of fences being broken, and (ii) minimise damage in cases where elephants manage to break through. TNC supported Nature Mates-Nature Club and Solitary Nature and Animal Protection Foundation (SNAP Foundation) to pilot an innovative fence design (called "Inno-fence") in a conflict-impacted village in MP.



Inno-fence design incorporating spring-mounted poles, hanging fence sections and sirenbased deterrence system, established with local capacity building.

The Inno-fence incorporates robust spring-mounted poles, a deterrence and early warning system, and hanging wires along with a standard solar energiser system. Fence poles are mounted on springs, allowing them to flex rather than break when pushed by elephants. The design also helps secure the fence against minor tree fall (a common cause of fence breakage).

The likelihood of elephants breaking through is itself further reduced by a sensor-based deterrence and early

warning system. When an elephant pushes against the fence, it triggers a siren placed nearby (thereby deterring the elephant), and also a siren placed within the village premises (thereby alerting the local community). Community-led Quick Response Teams can then respond appropriately as per their standard protocols, thereby maintaining the safety of both people and elephants. A hanging wire design is used on sections where poles cannot be installed (such as across ravines or valleys). The cost of this fencing system (material and implementation) typically is ₹2.5 lakh/km.

The above system was implemented on a 5-km stretch adjoining Lurghuti village (based on conflict vulnerability assessment by the park management) in Madwas buffer of Sanjay-Dhubri Tiger Reserve. Initial results suggest

that the fence is working well, and the community is continuing to maintain it (although longer-term sustainability depends on ownership and financing). Further evaluation of human-elephant conflict mitigation measures (involving both high and low technology methods as locally appropriate, integrated within a holistic system) can help strengthen human-elephant co-existence in MP.



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