

## Habitat connectivity crucial for tigers

Responsibility India's place in tiger conservation is crucial as it is home to 60% of the tiger population.

It is not just tiger numbers that are important. Habitat connectivity could be crucial in maintaining genetic diversity and, thereby, the survival of India's three tiger populations, suggests a recent study published in *Scientific Reports*. The isolated tiger population in Ranthambore in Rajasthan demands urgent conservation attention, being at risk of inbreeding and lack of connectivity with other populations.

India's place in tiger conservation is crucial: 60% of the world's wild tigers are found here. Apart from poaching and habitat loss, fragmentation is one of the threats India's tigers face. Tiger populations are now cut off from each other and their genetic profiles reflect this — smaller, isolated populations are less genetically diverse (due to lesser intermixing of different populations) than larger, connected ones. Genetic variation is crucial for evolution and low genetic diversity can threaten the survival of populations.

Scientists from five institutes including the National Centre for Biological Sciences (NCBS) at Bengaluru and Wildlife Institute of India at Dehradun studied genetic variation in India's tigers. While earlier studies had examined only around 12 regions of the tiger genome, this team analysed 10,184 single nucleotide polymorphisms (SNPs), which are several minute changes in the genome, in tissues of 38 wild tigers obtained during post-mortems from across 17 protected areas in India.

### Three lineages

They find that genetically, India's tigers comprise three distinct populations: the northwest cluster (consisting only of tigers from Ranthambore), southern (south India) and central (comprising tigers from the Terai, northeast and central India). While the isolated Ranthambore population had the least genetic diversity, the central cluster — which is also the most connected — harboured the highest. "We find that large seemingly more connected populations have more diversity than smaller isolated ones," says lead author Meghana Natesh at NCBS.

The study identifies new patterns that need to be studied in depth: tigers from the northeast and Simlipal (Orissa) appear to derive their ancestry from many regions. At the same time, the Ranthambore population, being cut off from other tiger populations, could be at risk in future due to inbreeding, which could decrease genetic variation in the population already at risk. This cluster needs urgent conservation action, say the scientists. "The future of tigers may depend on connected populations," they add. Tiger corridors could therefore be crucial in maintaining genetic diversity within and between these clusters and, in turn, aiding the survival of India's national animal.

A study of nearly 300 people living in different parts of India found that nine single-base variants (single-nucleotide polymorphisms or SNPs) account

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