

Wildlife overflow enriches biodiversity beyond park boundaries

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A Borneo pygmy elephant. Credit: Mike & Valerie Mille

New research published in *Nature* has discovered the power of large national parks to not only enhance bird diversity inside their borders but boost mammal diversity in nearby unprotected areas.

The University of Queensland's Dr. Matthew Luskin said the study, which involved using more than 2,000 cameras and bird surveys across Southeast Asia, reveals for the first time the benefit of expanding protected [land areas](#) around the globe beyond [park](#) boundaries.

"Protected area expansions are often a difficult and expensive process, but our results show they are absolutely worth it," Dr. Luskin said.

"We already know that protected areas can reduce logging—and you can see that from [satellite imagery](#)—but what you can't see is the number of animals inside the forest.

"We also know that marine parks often report biodiversity spillover, whereby fish reproduce successfully inside park boundaries and their offspring disperse, benefiting surrounding habitats.

"What we didn't know until now was whether terrestrial land parks are successful in providing biodiversity spillover, or simply displace biodiversity losses to surrounding areas.

"Our analysis has revealed the benefits parks, specifically large ones, have to terrestrial mammals.

"Specifically, we found that when comparing unprotected areas nearby large reserves to unprotected areas that didn't border large reserves, large reserves generated an up to 194% boost in mammal diversity."

Researchers say the results provide a much-needed conservation win for large reserves in the mega-biodiverse Southeast Asian region, which is under threat from a multitude of factors, namely hunting and deforestation.

"Hunting is a key concern for Southeast Asia and a prime suspect for

why diversity has often been assumed to decline outside of parks," Dr. Luskin said.



A group of Borneo pygmy elephants. Credit: Mike & Valerie Mille

"Hunters are mobile and so we had thought that hunting bans within park boundaries may only displace these activities to nearby unprotected areas, undermining their net benefit.

"It's common to see hunters inside and outside of parks in many countries and we expected that hunters' removing game animals would reduce diversity, but it appears parks limit hunting to the extent it doesn't

completely remove these animals.

"Another likely benefit of large parks is they support wide-ranging animals, such as tigers or elephants, that move across entire landscapes, including protected and unprotected areas."

Lead author, Dr. Jedediah Brodie from the University of Montana, and the Universiti Malaysia Sarawak, said the teams' work provides a clear motivation for future park designs to push for larger size as a key factor.

"This would fit nicely with the UN's 30 by 2030 goal, which would increase [protected areas](#) to 30% of all land," Dr. Brodie said.

"Larger parks routinely had higher bird diversity, and considering the UN's 30 by 2030 goal, these findings support the creation of fewer larger parks compared to many smaller ones."

Moving forward, researchers aim to quantify shifts in abundance of mammals and birds inside and outside of parks and expand their work to other regions, including Australia.

"I suspect that parks will support mammal abundances even more than [diversity](#)," Dr. Brodie said.

"It's certainly an interesting prospect and the team looks forward to clarifying the relationship between park types and biodiversity to ensure optimal conservation outcomes."

More information: Jedediah Brodie, Landscape-scale benefits of protected areas for tropical biodiversity, *Nature* (2023). [DOI: 10.1038/s41586-023-06410-z](https://doi.org/10.1038/s41586-023-06410-z).
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