

Pig nest-building promotes tree diversity in tropical forest: Study

by John C. Cannon on 15 March 2021



- *New research from a tropical forest in Malaysia reveals that wild pigs, better known for their destructive tendencies on farms and in ecosystems, may actually help encourage tree diversity in forests.*
- *Expectant mother pigs will build nests amid clumps of saplings, which are usually from a set of tree species common to the forest.*
- *When the sow kills these saplings for the nest, she's effectively providing a check on any one species becoming dominant in the forest.*
- *The research demonstrates the benefits that pigs can bring to forest health, but they also note that pig populations that grow too numerous could — and do, in places — keep the forest from regenerating.*

Wild pigs have reputation as a destructive lot. Farmers and scientists alike know that, when they're too numerous, their constant rooting and wallowing can run roughshod over crops and regenerating ecosystems. The predators that hunt them may have disappeared, or logging or agriculture may have degraded the forest, allowing pig populations to mushroom.

But such destructive tendencies also might be a boon to the overall health of forests in the right circumstances, according to recent research. A study

(<https://royalsocietypublishing.org/doi/10.1098/rspb.2021.0001>), published in the journal *Proceedings of the Royal Society B: Biological Sciences* on March 3, reveals that when sows build nests on the rainforest floor, they help maintain the balance of tree species diversity in the forest.

Popular in the Community

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Conversation



A wild pig in Peninsular Malaysia. Image by Bernard DUPONT from FRANCE via Wikimedia Commons (CC BY-SA 2.0).

Mother pigs in the forests of Southeast Asia typically look for beds of seedlings that have sprouted on flat, dry areas of the forest. They then clip these shoots or pluck them from the ground to form a protective nest for their young's first weeks of life.

Lead author and wildlife ecologist Matthew Luskin (<http://www.ecologicalcascades.com/>) of Australia's University of Queensland said that pigs are "efficient" builders.

"They don't shop at many different stores, each selling one plank, and then carry all the materials to build the house in a different location," Luskin said in an email. "They go to lumber yard to get all the materials needed to build a house, and then build the house right there in the lumber yard!"

The origins of the team's research stretch back decades in the Pasoh Forest Reserve in Peninsular Malaysia. Tapirs, civets and sun bears haunt Pasoh's primary forest, along with a lot of native wild pigs (*Sus scrofa*) — a "hyper-abundance," in fact, according to 2001 research (<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1744-7429.2001.tb00225.x>) by ecologist Kalan Ickes.



The research found that the destructiveness that wild pigs are often maligned for may actually help encourage tree diversity in forests. Image by David Cook via Flickr (CC BY-NC 2.0).

In 1995, a team from the Smithsonian's Forest Global Earth Observatory (ForestGEO) (<https://forestgeo.si.edu>) had tagged more than 30,000 saplings in the Pasoh plot as part of their global network of tree censuses. Then, in 1996, Ickes's doctoral research led him to begin scouring the forest for pig nests. When he found tagged saplings in a nest, he made a note of it. In the end, he had compiled a list of around 1,800 tags from more than 200 nests.

Around two decades later, Luskin teamed up with Ickes, currently based at Clemson University in South Carolina, to match up those tags with the tree census data from ForestGEO, down to the species of tree and

more than 700. He also discovered that the seedlings tended to be from more common species in the forest, while rare tree species weren't typically present in the clumps of seedlings where pigs chose to build their nests.

"This provides a rare species advantage that can maintain diversity," Luskin said. When a pig kills those seedlings for her nest, she's effectively providing a check on a small group of prevalent trees becoming too dominant and helping to cultivate the wonderful array of species dwelling in the region's forests.



An illustration of a wild pig like those found at the study site. Image © Tamzin Barber.

Still, Luskin and his co-authors are quick to caution that too many pigs in an area can throw off the delicate equilibrium of the forest ecosystem.

"While pigs may contribute to diversity, these findings must be viewed in context," said Stuart Davies, director of the ForestGEO program and a co-author of the study, in an email. "One has to remember, the hyper-abundance of wild boar in a number of Asian forests is dramatically reducing tree regeneration and perhaps even the functional composition of these forests. This may have long-term deleterious consequences for Asian rainforests."

Luskin said pigs could also "magnify" the loss of tree regeneration in forests that have been logged for timber or turned into oil palm plantations.

On the other hand, other research (<https://onlinelibrary.wiley.com/doi/full/10.1111/ele.12102>) has shown that the complete disappearance of pigs could also damage the health of the forest.

"This is exactly the finding from a nearby site where pigs were hunted out: tree seeds and seedling survived, total understory growth increased, and tree diversity decline," Luskin said.



A pig nest at the study site. Image © Matthew Luskin.

He said a disease like African swine fever, which is almost universally deadly to pigs and recently took hold (<https://news.mongabay.com/2021/02/southeast-asian-wild-pigs-confront-deadly-african-swine-fever-epidemic/>) in Southeast Asia, could touch off dramatic changes in the makeup of the forest.

"This new paper underscores the delicate balance between wildlife and environmental processes: human-influenced overabundance or underabundance of wildlife can have far-reaching effects on the whole ecosystem," said David Kurz, a wildlife ecologist and doctoral candidate at the University of California, Berkeley, in an email. "We can throw ecological communities out of whack either way."

Kurz studies wild pigs in tropical forests and is a former lab mate of Luskin's, but was not involved in this study.

"As conservationist Gerald Durrell once said," Kurz added, "the world is like a spider's web — by tearing one thread, we send shivers running through all the others."

The study provides further evidence of pigs' role as ecosystem engineers because of the outsize influence they have over their surroundings. But to Luskin, the fact that these animals, maligned in so many contexts for the damage they can cause, can provide benefits is "a little positive silver lining to the overall negative storyline," he said — or as, he likes to call it, a "silver swining."



A young wild pig in Peninsular Malaysia. Image by Rhett A. Butler/Mongabay.

Banner image of a wild boar in Malaysia by Bernard DUPONT via Flickr

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John Cannon is a staff features writer with Mongabay. Find him on Twitter: [@johnccannon](https://twitter.com/johnccannon)

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Citation:

Harrison, R. D., Tan, S., Plotkin, J. B., Slik, F., Detto, M., Brenes, T., ... & Davies, S. J. (2013). Consequences of defaunation for a tropical tree community. *Ecology Letters*, 16(5), 687-694. doi:10.1111/ele.12102

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