

# Study of human impact on food webs and ecosystems yields unexpected insights

February 22 2019, by Jenna Marshall

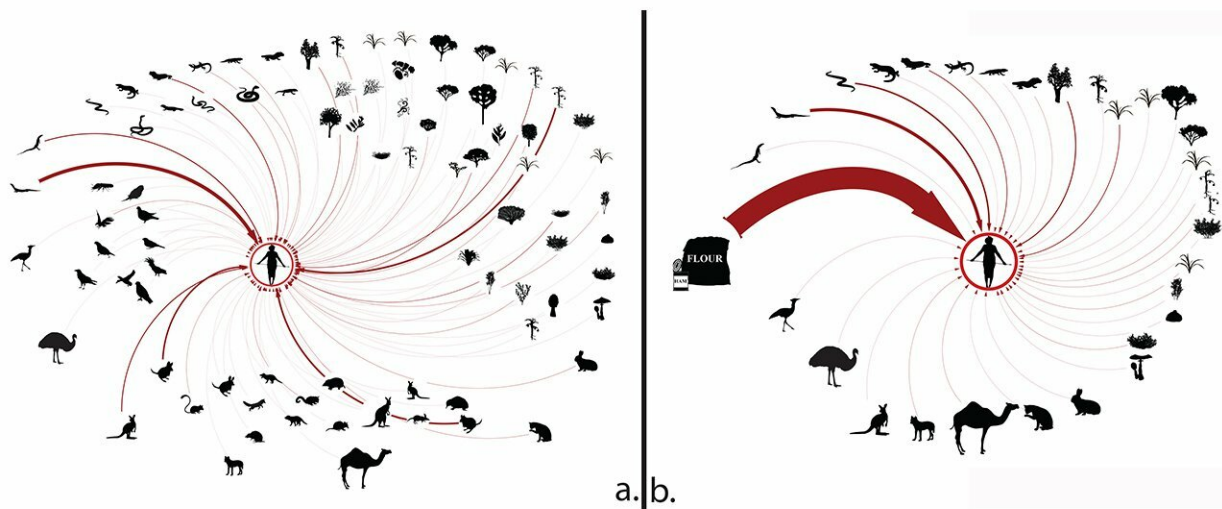


Fig. 1 from the paper: The constriction of the Martu foraged diet between the nomadic period (a) and the contemporary period (b) for the summer-season food web. Credit: Santa Fe Institute

When the Australian government relocated Martu hunter-gatherers from their Western Australia lands in the 1960s, no one could have predicted the massive impact their absence would have on the desert ecosystem. A new study led by Stefani Crabtree, a Santa Fe Institute Visiting

Researcher (Center for Research and Interdisciplinarity, Crow Canyon Archaeological Center), and co-authored by Rebecca Bliege Bird and Douglas W. Bird of the Pennsylvania State University, shows the critical role humans play in food webs, providing important clues to managing resilient ecosystems around the globe.

"Until 1964, the indigenous Martu people lived traditional, nomadic lives, hunting large monitor lizards for sustenance," Crabtree explains. "By lighting fires to expose their prey, they effectively created fire breaks each winter that protected the land from summer lightning fires. Their hunting methods also helped other species of plants and animals thrive, just as they dampened predators and suppressed harmful invasive species."

In the decades when the Martu were taken out of this food web, the ecosystem shifted significantly, with increased wildfires, reduced biodiversity, and the growth of invasive species—including the camels now wreaking havoc in Australian deserts. Comparing the 1960s food web to the modern food web—and showing all species as nodes on a network—demonstrates that the Martu were the "knitters" of their ecosystem, and that their removal had devastating results.

Exploring the role of humans within the [food](#) web is a fairly radical approach. "Ecologists typically look at ecosystems as separate from people, but to understand ecosystem health, we have to understand the people within the ecosystems," Crabtree says. "Using these kinds of well-resolved cases, where we have good snapshots of what people were like in the past and what they're like now, we'll be able to better understand our place in these ecosystems."

Rebecca and Douglas Bird, who have been living and working with Australian aboriginal communities for 17 years, believe there has been far too little research on the part humans play in our ecosystems.

According to Rebecca Bird, "Indigenous people like Martu, who have lived in the same region for millennia, have likely played an important role in shaping the assembly of plant and animal communities. It's important that we recognize that role, both for issues of environmental justice, and for understanding how best to go about restoring [ecosystems](#) to some prior state. Most attempts to reintroduce extinct mammals in the region have failed."

The paper, "Subsistence Transitions and the Simplification of Ecological Networks in the Western Desert of Australia," is published in the journal *Human Ecology*.

**More information:** Stefani A. Crabtree et al. Subsistence Transitions and the Simplification of Ecological Networks in the Western Desert of Australia, *Human Ecology* (2019). [DOI: 10.1007/s10745-019-0053-z](https://doi.org/10.1007/s10745-019-0053-z)

Provided by Santa Fe Institute

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