

Return of top predators is key to ecological future

April 23 2010



Cristina Eisenberg, a conservation biologist in the College of Forestry at Oregon State University, does field work on the importance of large predators in ecosystem function. (Photo courtesy of Oregon State University)

Sufficient advances have been made about the importance of top predators in ecosystem function that it's time to move from discussing the issue to acting upon it, a conservation biologist from Oregon State University suggests in a new book.

In "The Wolf's Tooth: Trophic Cascades, Keystone [Predators](#) and Biodiversity," just published by Island Press, Cristina Eisenberg outlines the many research findings in recent decades about "trophic cascades,"

or the string of problems that can be created when keystone predators - ranging from [wolves](#) to sharks or even spiders - are removed from an ecosystem, allowing other species to disproportionately flourish and cause havoc.

In particular, Eisenberg said, more has been learned about the significance of top predators on terrestrial systems, since their role in [marine ecosystems](#) was already more advanced. Scientists have now come to understand how wolves, cougars, bears and other leading carnivorous predators, which humans largely eliminated by the early 20th century, served a critical role in ecosystem function.

"The ecological concept of the 1990s was biodiversity, and that's important," said Eisenberg, who is the Boone and Crockett Fellow and a doctoral student in the OSU College of Forestry. "But in the next generation we want the concept of trophic cascades to have that same general awareness, because it's important too and essential to maintaining biodiversity. And we already know enough that it's time to start using these concepts to help ecosystems recover, not just in national parks or wilderness areas but everywhere."

These concepts have gained the most public awareness, Eisenberg said, with the return of wolves to [Yellowstone National Park](#). Wolves have helped to control the overgrazing done by elk, both by reducing their populations and also changing their behavior in what has been identified as "the ecology of fear." As a result, young aspen and willows are beginning to grow along streams for the first time since the 1920s. This will also help control erosion and lead to more beaver dams, researchers believe, and ultimately affect everything from birds to insects and fish, by improving their habitat.

"When we lost most of the large predators in the U.S., along with climate change and other population impacts, we started a hemorrhage of

extinction," Eisenberg said. "Streams are being degraded, species are being lost, the function of ecosystems that was once complex and diverse is being severely impaired. But it doesn't have to be that way. There are things we know that can change it."

Many of the obstacles to progress, Eisenberg said, are as much political and social as they are ecological.

In the 1930s, Eisenberg said, the famed naturalist Aldo Leopold once visited some lands in Chihuahua, Mexico that were owned by her grandfather on a huge cattle ranch, and Leopold remarked on how intact and thriving the lands appeared - which, at that time, were still roamed by wolves. Leopold was one of the first to point to the importance of predation in ecosystem function.

"My grandfather still felt he had to get rid of the wolves, so he gave my dad a summer job in which he was supposed to watch the cattle, and kill any wolves he saw," Eisenberg said. "My father later told me that he couldn't bring himself to do it, because he couldn't see that they were really causing any harm."

Eisenberg comes from a ranching background, and now lives in a valley in northwestern Montana where the wolf and grizzly bear population outnumber humans. In continued research, she's working to understand and demonstrate ranching practices and other techniques that can be used to balance commercial land use with the presence of wolves and other predators. It's both possible and necessary, she said.

"These really are not complicated concepts, they work, and they don't cost much," Eisenberg said. "There can be specific times and situations where predators may need to be controlled. But in many cases all we need to do to bring back predators is to stop killing them. It's all about relationships. I've explained ideas about trophic cascades to third graders

and they immediately get it.

"The problems are really more social, because many people have such an emotional reaction to large predators," she said. "But major predators were always a part of balanced ecosystem function, and allowing them to return will be one of the simplest, and most effective ways to restore these lands."

Much of the leading research on these concepts in terrestrial ecosystems has emerged from research at OSU in the past decade, Eisenberg said, in studies done by William Ripple and Robert Beschta in the College of Forestry. They have analyzed the impact of wolves and cougars as key predators in several national parks that, when allowed to recover, are helping restore healthy and vigorous ecosystems.

Eisenberg's new book provides both local and landscape-scale applications of what has been learned about these issues, and ways in which recovery efforts could begin.

Provided by Oregon State University

Citation: Return of top predators is key to ecological future (2010, April 23) retrieved 26 April 2024 from <https://phys.org/news/2010-04-predators-key-ecological-future.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.