

Herbivores take toll on ecosystem

Environmental effects from deer and elk rise as their natural predators decline, a study finds

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Deer, elk and other big herbivores cause surprisingly extensive damage to forests and streams when their populations surge as a result of killings of their natural predators such as wolves and bears, says a new study by two Oregon State University professors.

The research looked at 42 studies over the past 50 years across the Northern Hemisphere and found that the loss of big predators has allowed populations of moose, deer and other large herbivores to surge far above their historic levels, hammering the growth of young trees and reducing biodiversity.

“These issues do not just affect the United States and a few national parks,” said William Ripple, an OSU professor of forestry and lead author of the study. “The data from Canada, Alaska, the Yukon, Northern Europe and Asia are all showing similar results. There’s consistent evidence that large predators help keep populations of large herbivores in check, with positive effects on ecosystem health.”

In many cases, hunting of deer, elk and other herbivores by humans isn’t nearly enough to offset the herd growth allowed by the sharp reduction in natural predators, Ripple added.

Ripple said he hopes policymakers and land managers, when debating the fate of big predators such as wolves, take into account the domino effect of their removal.

“I am amazed at the long-term effect large herbivores have on landscapes. They change ecosystems one bite at a time, and it is a very slow process,” Ripple said. “Most people don’t think there would be a profound effect on ecosystems.”

Different interest groups for decades have fought over how to handle wolves, bears and other predators.

In Idaho and Montana, efforts are under way to kill hundreds of wolves in an attempt to reduce the harm they do to ranch herds and in order to increase herds of game animals such as elk.

Ripple said he started his research in 1997, trying to find out why aspen trees in Yellowstone National Park were declining. Doing tree ring studies, he traced the decline to the 1920s, when wolves were killed off.

“Then, elk browsed the aspen sprouts down enough where they could not grow into trees,” he said. The aspen decline persisted until wolves were brought back to Yellowstone in the 1990s, he said. The recent resurgence of streambank aspen and willow in Yellowstone has helped songbirds, beaver, frogs and fish, according to Ripple.

Because human hunters operate only in certain places and at certain times, their effect on deer, elk and moose is very different than that of large carnivores that are “on the landscape 24-7,” Ripple said.

The study found that densities of large herbivores — such as deer and elk — were six times greater in areas without wolves, compared to those in which wolves were present, the researchers concluded. They also found that combinations of predators, such as wolves and bears, can create an important synergy for moderating the size of large herbivore herds.

“Wolves can provide food that bears scavenge, helping to maintain a healthy bear population,” said Robert Beschta, a professor emeritus at OSU and co-author of the study. “The bears then often prey on young moose, deer or elk. In Yellowstone, more young elk calves are killed by bears than by wolves, coyotes and cougars combined.”

In Europe, the coexistence of wolves with lynx has resulted in lower deer densities than when wolves existed alone, the study found.

Damage caused by large herds of herbivores include killing small trees and causing stream bank damage, the study said.

The research was published online on Monday in the European Journal of Wildlife Research, a professional journal.

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