American kestrels provide important 'ecosystem services'

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A male kestrel in a northern Michigan cherry orchard. Males have gray wings; females, rusty wings. Credit: Catherine Lindell

America's smallest raptor, the American kestrel, can boost economies in Michigan and other fruit-growing states, new research shows. It's the first study to measure regional job creation aided by the activity of native predators.

American kestrels range from Alaska to South America. They dine on bugs, small mammals and fruit-eating birds. More kestrels mean fewer pests, and the tiny hawks' mere presence can produce measurable improvements, said Catherine Lindell, a Michigan State University (MSU) integrative biologist and study co-author. Growers can attract more of these beneficial birds by building nesting boxes.

A paper reporting the results was published today in the *Journal of Applied Ecology*.

"This research demonstrates that farmers can use science to design agricultural fields that benefit people and wildlife," said Betsy Von Holle, a program director for the National Science Foundation's (NSF) Dynamics of Coupled Natural and Human Systems program, which funded the research.

Lindell and her team calculated the benefit-to-cost ratios of installing kestrel nest boxes around orchards. The results showed that, for every dollar spent, $84 to $357 of sweet cherries are saved from fruit-eating birds.

To scale up the projections, the team used regional economic modeling. The models predicted that increased sweet cherry production from reduced bird damage would generate 46 to 50 jobs, which translates to a major contribution to Michigan's economy.

Ripe sweet cherries in an orchard with kestrel nest boxes installed. Credit: Catherine Lindell

"Having more American kestrels around orchards reduces the number of fruit-eating birds significantly," Lindell said. "It's not just a microeconomic boost that simply benefits the fruit grower—it has a macroeconomic effect that benefits the state's economy."

Added Von Holle, "Fruit-eating birds avoid orchards with American kestrels, so those with kestrel nest boxes end up producing more cherries. If kestrel nest boxes were used more widely, these researchers estimate, Michigan would benefit by adding new jobs and more than $2

million in increased revenue over a five-year period."

The strategy isn't limited solely to Michigan cherry producers. It's a potential boon for fruit producers throughout the kestrels' range, and is a cost-effective ecosystem service, the scientists said.

Finishing the installation of a nest box and tower before kestrels migrate to northern Michigan. Credit: Catherine Lindell

Though building nest boxes doesn't always guarantee a booming kestrel population, "installation and maintenance costs of boxes are small, and

even if box occupancy rates are low, they can direct kestrel activity to particular places in agricultural landscapes where kestrels can deter birds that are fruit pests," said Megan Shave, MSU integrative biologist and first author of the journal paper.

Although birds make up only 2 percent of kestrels' diets, just having the feathered enforcers in the area keeps many fruit-eating avian species out of orchards. These improvements give fruit growers another, more sustainable option to conventional pesticide-based crop protection, Lindell said.

Stephanie Shwiff and Julie Elser of the U.S. Department of Agriculture's National Wildlife Research Center performed the economic analyses for the study.


Tart Cherry
Varieties & Selection

Scientists add wood chips to the bottom of a kestrel nest box. Credit: Catherine Lindell

The view inside a nest box: Kestrels in northern Michigan usually lay four or five eggs. Credit: Catherine Lindell

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