

Return of the native wild turkey—setting sustainable harvest targets when information is limited

November 27 2017, by Liza Lester



A wild turkey peers through rain in Great Smoky Mountains National Park, 6 Nov 2017. Credit: Lisa Hupp/USFWS

As American families sit down for the traditional turkey dinner this

Thanksgiving, some will be giving thanks for a wild bird that is truly free range. *Meleagris gallopavo*, the wild turkey, has steadily gained in popularity with hunters since successful restoration efforts put it back on the table in the around the new millenium, bucking the trend of declining participation in hunting throughout the United States. The distinguished native bird is now second in popularity only to white tailed deer.

The recovery of the [wild turkey](#) is a great restoration success story. But concerns have been rising over the specter of declines in some areas. Lack of reliable tools to estimate abundance of turkeys has increased uncertainty for managers. So wildlife researchers at Michigan State University investigated how to harvest wild turkeys sustainably when information is imperfect.

"We are now learning what we didn't understand about turkey population dynamics. There is some concern among managers, because we are starting to see patterns of declining productivity and recruitment in some areas. That's complicated by the fact that most areas haven't had good, scientifically defensible methods of monitoring abundance of turkeys, and so have very uncertain knowledge of current population status," said Bryan Stevens, who led the study as part of his dissertation work at Michigan State.

Stevens and colleagues describe a formal evaluation process for managing wild game when rigorous abundance estimates not available, in a study published this fall in the Ecological Society of America's journal *Ecological Applications*.

They discuss a case study on the management of wild turkey harvests specifically, but present a structured decision making process that can be applied more generally, including in situations in which hunting provides an essential source of food for local people.

"As we dug into the turkey data, we realized this was a worldwide problem. How do we decide how to set management policies for sustainable harvests of wildlife when we don't have knowledge about abundance?" said Stevens, currently a postdoctoral researcher at the University of Idaho. Stevens led the study as part of his dissertation work at Michigan State.

Harvest benchmarks are typically based on studies of regional, defined populations of turkeys in specific locations. But ecologists know that localized environmental conditions affect critical population parameters, like how many chicks females produce that survive to adulthood. Turkey populations do not behave identically, everywhere.

To get around the information deficit, Stevens and his coauthors reviewed the available field studies, examining the differences in chick-rearing productivity and the rate of survival to adulthood of young birds. They looked at the relative vulnerability of males and females to hunters in different locations. Based on this observed heterogeneity, they incorporated ranges into their models rather than specific values. They assessed how sustainable turkey harvests responded to changes in productivity and vulnerability, to determine which attributes were most sensitive to uncertainty. By taking uncertainty about population and harvest parameters into account, the authors say, managers can apply principles of structured decision making to set harvest targets when they do not have the infrastructure to rigorously track changes in their turkey populations from year to year.

In some cases, this approach may mean more conservative limits than would be recommended if more information were available to tailor target reference points for the particular locality.

Stevens and his coauthors also talked with wildlife advocacy groups and hunters about their values and priorities in order to set performance

objectives. Though he heard minor concerns from the farming sector, most people enjoy large populations of turkeys. Turkeys do far less damage to crops than deer or raccoons and do not inspire the kind of controversy that smolders in discussions of sustaining large predators.

"Lots of people like seeing turkeys in parks and reserves, and even in their backyards. The turkey is fairly non-controversial," said Stevens.

Hunters in Michigan were most interested in sustaining their traditional opportunities to hunt during the spring.

Michigan, like much of the U.S., has two turkey-hunting seasons. The spring season allows only males to be taken. In the fall, after the year's chicks have reached adult size, both sexes may be hunted. Because turkeys are polygamous, their populations are more sensitive to the loss of hens during the fall hunt than the loss of males during spring. The researchers incorporated the hunters' preferences for the male-only spring hunt into their calculation of harvest targets.

They recommended that, when managers have no information about the new additions to the turkey [population](#) and the relative vulnerability of hens to hunters, fall harvest rates be no higher than 4, 2, or 1 percent of fall turkey populations when the corresponding male-only harvest in the spring had been low, medium, or high.

Wild turkeys came under intensive management in the 1940s when state and federal agencies were first organizing in response to vanishing wildlife.

At the time of the legendary first Thanksgiving, wild turkeys roamed the future United States from southern Maine to Florida, west to Texas and parts of the Southwest and Rocky Mountains. Henry David Thoreau was already lamenting the disappearance of wild turkey and other wildlife

from Massachusetts in his journal in 1856. By the 1930s, unregulated hunting and loss of woodland habitat had extirpated the turkey from much of its native range. Conservationists worried that the iconic bird might become extinct.

But the turkey bounced back surprisingly well with the end of commercial markets and unregulated hunting for wild game, and large-scale restoration and reintroduction efforts. It has returned to its historic range and beyond.

Habitat protections and changes in land use that led to the return of eastern forests gave the birds space to roam. Hunting groups played a large role in restoration, Stevens says, helping agencies to translocate birds from remnant populations in places like the Ozarks, and are still involved in planting wildlife-friendly vegetation and other habitat management. The birds also adapted better to agricultural landscapes and human presence than expected.

Early wildlife managers underestimated the resilience of the turkey, in part because at the time restoration began, biologists believed the birds required large tracts of mature forest. Turkeys actually do just fine on the edges of human occupied spaces, as long as they have food and trees for roosting. The males' distinctive gobble can even be heard in green spaces in the heart of industrial Lansing, Michigan.

"Adaptable is a good word to describe turkeys. They are really good at surviving on the fringes of developed country as long as there is food. They eat a lot of different things: bugs, grains, nuts, forbes. In agriculture-dominated landscapes they eat the residual grains, corn, and soybeans left after harvest."

"Restoration of wild [turkeys](#) was really successful. The populations appeared to go up, up, and up. Now restoration is essentially finished,

and the task is to determine how we can best manage the birds sustainably into the future, given existing uncertainties and the changes in demography we are starting to observe," said Stevens.

More information: Bryan S. Stevens et al, Identifying target reference points for harvesting assessment-limited wildlife populations: a case study, *Ecological Applications* (2017). [DOI: 10.1002/eap.1577](https://doi.org/10.1002/eap.1577)

Provided by Ecological Society of America

Citation: Return of the native wild turkey—setting sustainable harvest targets when information is limited (2017, November 27) retrieved 26 April 2024 from <https://phys.org/news/2017-11-native-wild-turkeysetting-sustainable-harvest.html>

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