After Lean Acorn Crop in Northeast, Even People May Feel the Effects

In Central Park, more than 1,000 trees in the red oak family were spangling the scenery with the colors of autumn.

But this year, they were failing to do something else they generally do in the harvest season: produce acorns.

"I remember going into areas and you'd get the crunch of acorns under your feet," said Neil Calvanese, vice president for operations at the Central Park Conservancy. "And this year, you kind of have to search around for them."

It is a phenomenon happening not only in New York but also throughout the Northeast. While last fall set a recorded high for acorn production, at roughly 250 pounds per tree, this year is seeing a recorded low, with a typical tree shedding less than half a pound of its seeds, said Mark Ashton, a forest ecologist at Yale University. On average, oaks produce about 25 to 30 pounds of acorns a year.

"Scarlet oak, black oak, true red oak," Dr. Ashton said. "These are the ones that dominate our forest, and these are the ones that aren't producing acorns this year."

Coming on the heels of an acorn glut, the dearth this year will probably have a cascade of effects on the forest ecosystem, culling the populations of squirrels, field mice and ground-nesting birds. And because the now-overgrown field mouse population will crash, legions of ticks — some infected with Lyme disease — will be aggressively pursuing new hosts, like humans.

"We expect 2012 to be the worst year for Lyme disease risk ever," said Richard S. Ostfeld, a disease ecologist at the Cary Institute of Ecosystem Studies in Millbrook, N.Y. "We are already planning educational materials."

It will probably turn into a big year for animals' being killed on highways as well. Deer, in search of alternative sources of food, will leave the cover of the oak trees and wander out closer to roads.

"I would expect that traffic collisions are going to be higher in a year like this year," Dr. Ostfeld said.

While scientists do not fully understand why this year has produced the lowest acorn crop in 20 years of monitoring, there is nothing unusual about large fluctuations in the annual number of acorns. Fingers are not being pointed at global warming.

Oak trees "produce huge, abundant amounts one year and not in other years," Dr. Ashton said. "I don't think it's bad — the whole system fluctuates like this."

One theory for why oak trees vary their acorn yield is the so-called predator satiation hypothesis. Under this theory, during bumper years, the trees litter the forest floor with seeds so completely that squirrels, jays, deer and bears cannot possibly eat them all. Then, in off years, the trees ramp down production to keep the predator populations from growing too large to be satiated.

But the variability of weather in New York and New England could also be playing a role in the shortage this year.

"A lot of it has to do with the initial spring," Dr. Ashton said. Acorn production is high when "everything converges on a perfect spring."

It takes a red oak 18 months to grow an acorn. The tree is pollinated in the spring of one year, and its acorns drop in the fall of the next year. The rainy spring of 2010 could have dampened the wind-driven transfer of pollen from one tree to another, resulting in the acorn dearth this year.

While acorn fluctuation is normal, what is unusual this year is the abundance followed by the steep drop. "In a sense, it's just another trough," Dr. Ostfeld said. "But this is the most extreme pair of years that we've seen."

Dr. Ostfeld describes acorns as an engine that drives the forest ecosystem. "When that engine is cooking along," he said, "you get these heavy knock-on effects."

The population of field mice, for instance, exploded this summer. While that was good for the mice, it was bad news for low-nesting birds like the wood thrush, whose nests are susceptible to rodent predation. In addition, the large numbers of mice caused an increase in the tick population.

On the other hand, Dr. Ostfeld said, "when you get a failure of the engine, things just change radically."

Now the field mouse population is expected to crash — about 90 percent have died off in similar glut-dearth acorn sequences in the past. And the outlook is not good for the low-nesting birds, which face an increased threat from hawks and owls.

"The adult wood thrush will take it on the beak by the one-two punch," Dr. Ostfeld said.

But in the middle of New York City, Central Park will be buffered from the ecosystem effects of the acorn engine.

"It's a very managed environment," said Arthur Elmes, the tree data coordinator for the Central Park Conservancy. "It's nothing that won't be corrected in years to come."

Identifying Cause-and-effect Relationships