

a birding essay

Passenger Pigeons, Lyme Disease, and Us:

The unintended consequences of the death of a species

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"I was perfectly amazed to behold the air filled and the sun obscured by million of pigeons, not hovering about but darting onwards in a straight line with arrowy flight, in a vast mass a mile or more in breadth, and stretching before and behind as far as the eye could reach."

—W. Ross King, 1866, *The Sportsman and Naturalist in Canada*

Next month, on the first day of September, we will quietly slip by an ornithological anniversary, marking the sad end of a bird species. It was on 1 September 1914 that the fabled Martha, last of the Passenger Pigeons, died in the Cincinnati Zoo.

When we ponder the death of a species, it is hard to conceive of what once was and will never again be. The extinction of the Passenger Pigeon was a tragedy for many reasons. It was a loss of a valuable food resource for

people, a loss to science, and a major ecological loss. The extinction of the Passenger Pigeon may have also contributed to health problems that people experience today.

Passenger Pigeons, as most birders know, were once the most abundant landbird in North America. When European settlers arrived on these shores, the population of Passenger Pigeons may have ranged between three billion and five billion individuals. They occurred only in eastern North America. Their numbers were legendary. The accounts of early naturalists such as "beyond numbers of imagination," "seeing neither beginning nor ending, length, or breadth of these Millions of Millions", "so many that they obscured the light" would seem to be absolute exaggerations if they were not repeated by so many independent observers over four centuries.

Yet, in less than a century, the populations of wild pigeons, as they were known, went from hundreds of millions to nothing. The evolutionary and ecological attributes that led to their incredible success also contained the seeds of their destruction. The Passenger Pigeon was highly specialized as a consumer of acorns, beech nuts and chestnuts (although these were not usually mentioned relative to acorns and beech nuts) that were the bounty of the vast deciduous forest that once spread across the eastern United States and southern Canada. Oaks and beech trees over a vast area occasionally produce huge bumper crops of nuts (known as mast). These mast crops are produced intermittently and unpredictably. Masting may occur in response to unknown environmental cues. It also appears to be an adaptation to satiate seed predators whereby enough seeds are produced that at least

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some will escape being eaten.

Passenger Pigeons with their tremendous mobility and nomadic behavior were able to take advantage of these rich food resources. Enormous flocks of pigeons raced across the eastern part of the continent, traveling hundreds of miles in a day in search of sufficient mast. When they found it, they settled in, establishing vast roosts or nesting colonies covering dozens of square miles. The Passenger Pigeons took advantage of the predator satiation “strategy” of the trees to create their own predator satiation strategy. There were so many pigeons in these “pigeon cities” that no predators could make a dent in their numbers. Because the location of mast varied from year to year, so did the location of pigeon nesting colonies.

Yet, eventually “*Homo technicus*” exterminated the birds. Americans did it with the old tools of ax, saw, shotgun, net, match, and pole and with new 19th century technologies, railroad and the telegraph, which allowed them to reach nearly every nesting colony from the 1860s onward. The extermination was unintentional. It was a combination of pursuit for the money that could be gained by shipping pigeons dead and alive for meat, for feathers, and for sport, along with ignorance. Americans did not think that clearing forests and pillaging nesting colonies could actually wipe out a species—something that is all too familiar today but was only beginning to be understood a century ago.

Every colony came to resemble a battleground with adults and young birds being taken from the nest, trees chopped down or set ablaze, not to mention the constant shooting that added to the normal chaos of a colony of tens or hundreds of millions of birds. By the end, the pigeons were so skittish that they simply abandoned their colonies. For about 20 years, there were no successful mass nestings.

Although this sounds like ancient

history, familiar to most birders and with no direct relevance to us now, I propose the intriguing possibility that the absence of the Passenger Pigeon may play a role in the outbreaks of Lyme disease that plague Americans today. This possibility builds upon some clever research by ecologists Richard Ostfeld and his colleague Clive Jones of the Institute of Ecosystem Studies in Milbrook, New York. Drs. Ostfeld and Jones have attempted to untangle the intricate relationships among the plants and animals that make up the present-day eastern deciduous forest. They have discovered a relationship between the masting patterns of oaks and the occurrence of Lyme disease.

In a very simplified description of

their elegant work, they have shown by both observation and experiment that risk of Lyme disease increases two years after a bumper crop of acorns. This happens due to the complex life cycle of the small *Ixodes* ticks that spread the disease. White-tailed Deer are among the first animals to take advantage of the crop of mast, moving into the area shortly after the acorns fall. As the deer walk through the woods, they brush against vegetation containing adult ticks, which then attach to the deer for a meal of blood. After mating while on the deer, the female ticks drop off the deer, burrow into the leaf litter and wait until the following summer when they each produce about 2,000 eggs and die. Areas

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that had been rich in acorns the previous autumn are rich in larval ticks the following summer.

At the same time, the local population of White-footed Mice skyrockets because they, too, have been feeding on superabundant acorns. When the larval ticks hatch, they attach themselves to mice, most of which happen to harbor the Lyme disease bacterium among other pathogens in their blood stream. When the juvenile ticks drink mouse blood, they also ingest Lyme disease organisms. Ticks also feed on other small animals, but those species do not usually contain Lyme disease bacteria.

A year later, the ticks have matured, and the area that two years ago had an abundance of acorns now has an abundance of disease-carrying ticks. That, as too many of us know, is bad news for people who then walk in the same woods.

Where do Passenger Pigeons come into this fascinating story? More than a

century ago, deer and mice would not have been the only animals to move quickly to exploit a bumper crop of mast. Enormous flocks of southbound Passenger Pigeons searching the landscape for mast fed on fallen acorns as well as those still on the tree. The flock exhibited a "rolling" appearance as the birds from the rear of the flock rose continuously over the treetops and descended at the front of the flock. According to one observer, "In their travels they make vast havock (sic) among the acorns and berries of all sorts, that they waste whole forests in a short time, and leave a famine behind them for most other creatures."

Thus, the whole cycle of increased local populations of deer, mice, and ticks might never have happened if the two mammal species had to compete with Passenger Pigeons for mast. Could Passenger Pigeons have been one of the factors that kept Lyme disease rare until late in the 20th century?

Of course, the absence of Passenger Pigeons is only one of the changes in the eastern deciduous forest. The American Chestnut, once a dominant forest tree, and a source of food for seed-eating animals, including Passenger Pigeons, is gone because of the exotic chestnut-blight fungus. With the absence of predators such as wolves and Mountain Lions and the change from a largely continuous forest to a fragmented patchwork in an agricultural landscape, White-tailed Deer populations have increased nearly 10-fold from the two million present at the turn of the last century.

It is hard to deconstruct the ecological relationships in a current ecosystem. It is even more difficult to make strong statements about the past. However, it is clear that the loss of the Passenger Pigeon as well as other elements of the pre-Columbian environment impoverish us in ways that we may not even be aware of. 🌿

SHORT TRIPS FOR AMERICAN BIRDING ASSOCIATION'S SPECIES

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TO
2002

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Boreal Owl and Other Owls
Penticton, BC. November 1-4, 2001. Led by Dick Cannings.

Dovekie, Iceland & Glaucous, many Boreal species
Halifax, NS. January 5-9, 2002. Led by Blake Maybank.

Yellow Rail, Ferruginous Pygmy Owl, Whooping Crane
Houston, TX. January 17-21, 2002. Led by P.D. Hulce.

Brown Jay, White-collared Seedeater, Tamaulipas Crow, Mexican Vagrants
Harlingen, TX. January 22-27, 2002. Led by P.D. Hulce.

Black-capped Vireo, Golden-cheeked Warbler
San Antonio, TX. April 19-22, 2002. Led by P.D. Hulce.

Colima Warbler, Gray Vireo, Lucifer Hummingbird, Common Black-Hawk, Montezuma Quail
Midland, TX. April 22-27, 2002. Led by P.D. Hulce.

Bicknell's Thrush, both Sharp-tailed Sparrows
Portland, ME. June 6-9, 2002. Led by Bill Drummond.

White-tailed Ptarmigan, both Prairie Chickens, Sage Grouse, Sharp-tailed Grouse
Denver, CO. April 9-15, 2002. Led by Bob Odear.

Maroon-fronted Parrot, Worthen's Sparrow, Pine Flycatcher.
From Monterrey, Mexico. October 25-28, 2001. Led by P.D. Hulce.

Great Lizard-Cuckoo, Bahama Parrot, Cuban Emerald, Bahama Woodstar, White-cheeked Pintail, West Indian Whistling Duck, Bahama Yellowthroat, Olive-capped Warbler.
From Marsh Harbor, Bahamas. March 18-24, 2002. Led by Tony White.

Bay-breasted & Hispaniolan Lizard-Cuckoos, Hispaniolan Parrot & Parakeet, La Selle Thrush, Western Chat-Tanager, Broad-billed & Narrow-billed Todys, Hispaniolan Trogon.
From Santo Domingo, Dominican Republic. March 26-31, 2002. Led by Kate Wallace & Bob Odear.

Bearded Wood Partridge, Sumichrast's Wren, White-faced Quail-Dove, Bumblebee Hummingbird, Dwarf Jay, Azure-hooded Jay, Slaty Vireo, Hooded Yellowthroat.
From Veracruz, Mexico. May 27-June 3, 2002. Led by Ernesto Ruelas.

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This diorama, with flying Passenger Pigeons, is at the James Ford Bell Museum of Natural History. The background was painted by the famed Francis Lee Jaques. The mounts and display were prepared by John Jarosz. It portrays a small flock of Passenger Pigeons in the upper Midwest.

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