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New Thoughts on the Extinction of the Passenger Pigeon

by
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Three hundred years ago the Passenger Pigeon *(Ectopistes migratorius)* was the world's most abundant bird. Though found only in eastern North America, it numbered three to five billion, accounting for about one of every four North American land birds. Passenger Pigeons travelled in flocks of hundreds of millions, at times obscuring the sun. Yet, by 1900 almost no Passenger Pigeons remained in the wild. In 1914 the last one died in the Cincinnati Zoo.

Why was the Passenger Pigeon so numerous? How did it become extinct? Why was its demise so rapid?

Success

Colonial behavior was the key to the Passenger Pigeon's success. The birds nested in colonies containing millions of pairs, travelled together to feed, and roosted together at night. The entire population, however, consisted of an amazingly small number of flocks, probably fewer than two dozen. Each flock was so large that the chance of any one bird being killed by a predator was very small, just as a fish in the middle of a school is effectively hidden from sharks. This protection is called predator saturation. Wherever the

pigeons went there were not enough predators to make a dent in their numbers.

How could so many pigeons find enough food? Before settlement by Europeans, eastern North America was almost completely covered by deciduous forest. Several of the forest trees—oaks, beech, and chestnut—produced large nutritious nuts that were the Passenger Pigeons' main food. Every few years these trees produced enormous crops of nuts. This pattern of "mast fruiting" at unpredictable times enabled the trees to saturate their local seed predators—as colonial nesting enabled the pigeons to saturate their predators—and thus increase their reproductive success. Flocks of Passenger Pigeons roamed the forest, travelling hundreds of miles a day at times, until they found an area with a heavy mast crop. They remained in the area until they depleted the food supply. So efficiently did they scour the forests that hogs sometimes starved in their wake. In summer, when nuts weren't available, the Passenger Pigeons travelled to the northern Great Lakes states and Canada to feed on berries.

Nesting colonies formed in the spring where large crops of nuts from the past autumn remained on the ground. Because the locations of large mast crops changed from year to year, Passenger Pigeons rarely nested in the same place two years in a row. After certain poor mast years, there was probably no major nesting attempt. Most years, at least one huge colony nested in the east (usually in the forests of New York or Pennsylvania) and one in the midwest. During the 1800s, the midwest colony usually nested in Michigan in even-numbered years after a large beech mast, and in Wisconsin—where the birds fed on acorns—in alternate years. There were some nestings in southeastern Minnesota, even in what is now the Twin Cities area.

A nesting usually consisted of several colonies in adjacent counties. The largest nesting ever recorded, in Wisconsin in 1871, covered 850 square miles and comprised at least 135 million adults. Every suitable tree had nests, sometimes 50 or more, each containing only one egg. Nesting within a colony was highly synchronous, with most of the eggs laid on the same day. There were so many nests that non-human predators could hardly affect nesting success.

The supply of nuts diminished quickly each spring, so most Passenger Pigeons probably nested only once a year. Pairs did, however, replace eggs that broke.

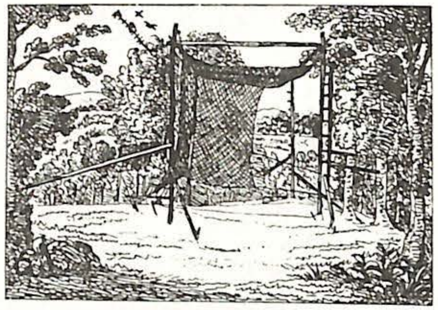
Decline

How did the most numerous bird in the world decline from billions to extinction in less than 50 years?

The arrival of flocks of Passenger Pigeons always meant food to the local people, whether natives or settlers. Nevertheless, people probably had little impact on the number of pigeons until they began harvesting them for market instead of just for the home. Market harvesting began before 1800, but was not a major industry until 1840.

Two technological developments of the 19th century increased the efficiency and scope of market harvesting to the point where it was ultimately responsible for the extinction of the Passenger Pigeon. The seemingly unrelated advances were the railroad and the telegraph.

By the time of the Civil War, the railroad covered most of America east of the Mississippi River. The railroad allowed the professional pigeoners, who numbered about 1000 in their heyday, rapid access to all major nesting colonies. Equally important, it provided a quick way to ship barrels of pigeons to the big city markets in the east and midwest. How quick? In 1800 travel between New York and Chicago took six weeks. By 1830, it took only half that time, and by 1857 it took less than two days. Freight moved almost as fast, taking, in 1849, nine transfers and nine days to go from Philadelphia to Chicago. By 1859 this took three days without transfer.



The telegraph kept the professional pigeoners informed of the locations of nesting colonies. Almost as soon as one was found, all the harvesters knew about it and were on their way.

After 1861, only a handful of colonies were too far from rail or ship for market exploitation. Even a nesting in Oklahoma in 1881 that was 110 miles from the nearest railroad was plundered by professionals who used teams and wagons to haul out their quarry.

The impact of the harvest was awesome. At the 1860 nesting near Grand Rapids, Michigan, pigeoners shipped 588 barrels—over 100,000 pounds— of pigeon to market. At 350 pigeons per barrel, more than 200,000 pigeons went to distant markets from that nesting. With local markets and home use, birds that died in the nest, and birds left for the hogs to clean up, probably one million birds were destroyed at this single nesting.

Harvests of this magnitude continued for another 20 years! The largest harvest was probably at Petosky, Michigan in 1878, where the nesting colony covered about 250 square miles. In three months, 1.5 million dead and more than 80,000 live birds were shipped by rail, and probably as many by water. Up to 10 million pigeons may have perished at that nesting alone.

Three main methods were used to capture Passenger Pigeons: netting adults, shooting adults, and taking the young from the nest.

Most professional harvesters captured adults in nets at baited sites near the nesting grounds. A single release of the net often took more than 200 birds. Although millions of pigeons were killed this way, netting alone could not have wiped out the population because the rest of the pigeons continued to nest, apparently undisturbed by the netting.

Shooting, mostly by locals and sportsmen, not professionals, was less efficient than netting but also very important as a cause of extinction. People shot birds within the nesting colony, even shooting them at the nest. The commotion often caused the birds to abandon their nests.

The fat nestlings were prized even more than the adults. Professionals and locals alike harvested the nestlings by chopping down the nest trees, by knocking the young out of the nest with poles, and even by setting the nest trees on fire to cause the adults and young to jump out. In a typical densely populated colony it was possible to harvest nearly all the young.

Extinction

Despite the scale of the slaughter, overhunting did not exterminate the Passenger Pigeon, as it nearly had the buffalo. Instead, Passenger Pigeons became extinct because over a period of about 20 years—twice an individual's lifetime—adults were prevented from replacing themselves, directly by the nestling harvest and indirectly by the shooting, which led to nest abandonment. Had reproduction continued, it is unlikely that netters and shooters away from the nesting sites would have exterminated the Passenger Pigeon. There were simply too many pigeons for the harvest of adults to be complete.

The first record of a nesting colony being abandoned because of shooting was in 1869 in Wisconsin. Laws passed in the early 1880's to prohibit shooting near the colonies were ineffective; abandonment became even more common.

Slaughter at the nesting colonies continued to the end. The last attempt at colonial nesting was in 1887 in Wisconsin. These birds left about two weeks after they started to nest, probably disturbed by shooting.

What happened once the Passenger Pigeon population was reduced to a small number of old birds? The pigeons continued to attempt to nest, but in small colonies and lone pairs. Without the protection afforded by the large colonies, these last birds must have lost many nests to predators. Even successful pairs only raised one offspring a year. This was just not enough to save the pigeon, whose whole reproductive strategy depended on mass nesting. And so, the Passenger Pigeon, which was once the most abundant land bird on the planet, vanished forever. ■

This paper was presented by David Blockstein at the 1984 annual meeting of the American Ornithological Union. David is a graduate student at the Bell Museum studying the breeding ecology of mourning doves.

For additional information, see:

Schorger, A.W. 1955, *The Passenger Pigeon, Its Natural History and Extinction* (University of Wisconsin Press, Madison, and University of Oklahoma Press, Norman, (paperback).

Illustrations

Page 1: Passenger Pigeon exhibit at the Bell Museum

Page 2: Shooting wild pigeons in Louisiana, 1875

Page 3: Pigeon net used in Quebec, 1831

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