

## The Common City Pigeon's Adaptations to Urbanization in New York City

AP Seminar

Word Count: 1966

## Introduction

The common city pigeon has extensively learned to adapt to urbanization in New York City. Clergeau is affiliated with the French National Museum of Natural History, where he is a research scientist in the Ecology and Biodiversity Management Research Unit. Clergeau defines urbanization as the conversion of natural or semi-natural habitats to an urban landscape (Clergeau, 2001). Wu is a professor of Geography and Environment and a remote sensing expert, who is affiliated with the Department of Geography and Environment at Boston University. Wu describes New York City as a rapidly growing city, which from 2000-2010, urbanization rates grew 20% (Wu, 2018). With this increase in urbanization, many new challenges arise. Pollution and the slow elimination of nature in these cities becomes increasingly evident. This creates new challenges for many species that thrive within these urban cities. Most notably, the common city pigeon. It was able to adapt to rapid urbanization through finding new sources of food. They scavenge for food from a variety of human sources, including trash cans, sidewalks, and outdoor cafes. Since they are forced to eat from polluted areas and trash within the city, they could get contaminated with diseases and plastics. This creates a bigger problem. It forces these Pigeons to go from accessible food sources to difficult and harmful sources of food. Everyday, living things are evolving differently in cities than in the surrounding countryside (Bender, 2022). The common city pigeons are the ones suffering the most, as they are found everywhere, from city parks, to high rise buildings, and anywhere in between. With the ongoing problem of food scarcity and disease spreading in urban cities amongst the common city pigeon, the effects are staggering, therefore a solution should be

implemented to reduce these problems. With the main solution being rooftop green spaces. Green spaces would be implemented on the rooftops of buildings in the city, including bushes and trees, acting as a new food source for these pigeons. Ultimately, this leads to the main question at hand; To what extent has the common city pigeon adapted to urbanization in New York City?

**Problem: Food Scarcity/ Accessibility**

According to Eric Bender, who is an associate director for communications and public affairs at the Whitehead Institute for Biomedical Research, he says that residential areas around New York City provide less food. This finds that common city pigeon populations are more concentrated in the city, thus contributing to the problem of these birds feasting on polluted trash and other human sources that are commonly found in the city. Since the populations are so concentrated, hundreds of pigeons flock at small piles of trash for food. This leads to food scarcity and accessibility. The biggest threat to these pigeons is how they are able to navigate through the city and find food sources. Whether it be trash left by a restaurant, or garbage on the streets, it has become increasingly difficult for these pigeons to navigate their way around the city in search of food (Haag-Wackernagel, 2004). As a direct result, the behaviors of these pigeons have also changed, since scavenging for food forces them to form certain behaviors in this process.

Additionally, Eric Bender, in the same study “Urban Evolution: How species adapt to survive in cities”, stated that impoverished neighborhoods tend to have greater exposure to pollutants and other environmental disadvantages (Bender, 2022). In New York City, many areas of the city are induced in poverty. Lots of neglected areas leak pollutants into the air and streets

of New York, harming the urban ecosystem. Whether it be more central to the city or more towards the outskirts, these pigeons congregate everywhere. The abundance of their population forces them to fight over food and have struggles in finding food. Therefore, Bender's study helps outline these areas of tough food scarcity. Julia Watson, a leading expert on indigenous technologies, mentions that over time, species learn to adapt to the constantly changing urban environment (Watson, 2020). This is important for these pigeons, because as they scavenge amongst the city, they develop behaviors and learning patterns that they get. This forces them to form feeding patterns on patches of polluted trash, further negatively affecting their health. Thus, food scarcity forces the common city pigeons to create unhealthy food patterns, through their habit of scavenging at trash sources.

### **Disease Spread**

Research studies have shown that scavenging for food in urban cities, such as New York, can expose pigeons to a variety of health risks. Battisti, a professor of Urban Studies at the University of Massachusetts in Boston, found that feeding on garbage can lead to a deficiency in essential nutrients, which can compromise the immune system of the pigeons and make them significantly more susceptible to diseases. This vulnerability to diseases makes it easily transmittable amongst the pigeon population in New York City. Since they often flock together, then it is highly likely that when one has a disease the whole flock will also get infected by that disease (Battisti, 2017).

One of the diseases that urban pigeons are highly susceptible to is avian pox. Shawkey, who is an ornithologist focusing on bird physiology and behavior, found that this viral disease affects the bird's skin and mucous membranes and can lead to the formation of lesions on the

bird's body. This disease is frequent in pigeons and can lead to death within these pigeons (Shawkey, 2003). A study conducted by Johnson, who is a research scientist in the Department of Microbiology and Immunology at The Weill Cornell Medicine in New York, found that avian pox is prevalent among urban pigeons, with a prevalence rate of up to 15%. The study attributes the high prevalence of this disease among these birds to their tendency to congregate in large numbers and to feed off of contaminated sources of food (Johnson, 2015). Thus, further proving the subsequent issue of food scarcity in New York City. The lack of viable food sources for these pigeons creates a chain reaction of deficits.

Another disease that can affect urban pigeons is Chlamydiosis. Şahindokuyucu is associated with Bornova Veterinary Control Institute, Ministry of Agriculture and Forestry, Izmir Turkey, and found that this bacterial infection is transmitted through the droppings of infected birds and can cause extensive health issues in pigeons across a wide range of problems, including respiratory problems, eye infections, and even death in severe cases (Şahindokuyucu, 2018). A study by Prisca Mattmann, who is affiliated with the Swiss Ornithological Institute in Sempach, Switzerland, found that urban pigeons have a high prevalence of Chlamydiosis, with up to 50% of sampled pigeons being infected. The study attributes the high prevalence of the disease to the poor hygiene conditions in urban areas and the pigeons' habit of feeding on contaminated food sources (Mattmann, 2019). When the only food source that pigeons have is trash, it makes these pigeons prone to these diseases much more than rural pigeons living away from urban cities. Since a majority of the trash found is contaminated, the rate of disease spread can be seen to have a drastic increase.

Therefore, it is clear that the scavenging habits of urban pigeons are a significant contributor to their poor health and high susceptibility to diseases such as avian pox and

chlamydiosis. By forcing the pigeons to rely on garbage as their primary source of food, we are exposing them to harmful bacteria, viruses, and other disease-causing agents. The high prevalence of diseases such as avian pox and Chlamydiosis among urban pigeons is a clear indication that this urgent issue needs to be addressed with a viable solution.

### **Solution: Green Spaces**

Pigeons are crucial creatures in an urban setting like New York City. Pigeons play a role as seed dispensers. Ideally, through feeding off of nuts and fruits, these pigeons digest the seeds. Through digestion, while flying around the city they would release their droppings all around. These droppings would contain seeds. This scatters seeds across the city. This would then lead to increased biodiversity across the city, a crucial role in promoting ecological growth. This gives them another title, being ecological contributors. They become prey for urban predators, which in turn contributes to New York City's urban food web.

With this, it is important to note that it is evident that these pigeons have not yet fully adapted to urbanization, therefore a solution needs to be carried out to help maintain and implement their importance to a full extent in an urban setting.

When it comes to the issue of food scarcity for these pigeons, a viable solution can be seen through the incorporation and expansion of rooftop green spaces in New York City. Rooftop green spaces utilize the top of buildings and other urban infrastructures in the city as an area to create a small little garden, or even large green spaces that have full grown trees and shrubbery. These green spaces would have fruit trees and bushes, which would become the common city pigeon's new source of food. Shawkey finds that once these pigeons know that they have a

reliable food source, they would be able to form feeding patterns amongst the city (Shawkey, 2003).

According to Dustin Partridge, who is associated with the Department of Biological Sciences, at Fordham University in the Bronx in New York, he says that rooftop gardens provide new habitat spaces for these birds. The main benefits with this solution is that it would provide a nutritious food source for these pigeons along with other bird species, as the new habitat space provides more green areas for the pigeons. These green spaces would include gardens that have a fresh source of nuts and fruits (Partridge, 2018). Rather than feeding off of the contaminated garbage that they normally eat, they would be eating nuts, berries, and seeds that would help promote healthy pigeons. This would consequently reduce infection rates and the spread of these diseases.

Since these green spaces could be anywhere from 4 square feet up to even 4000 square feet, it would work in a city like New York, which has very limited space, as they could fit on almost any rooftop area. It would also attract a variety of species to the area, promoting biodiversity in the city.

However, this solution has a limitation, with it being the price tag with building rooftop green spaces. According to Lawnstarter, which is a company focused on roofing and other infrastructure improvements, the average rooftop green space costs \$50 per square foot, while a regular roof costs \$10 per square foot (Purnell, 2023) . Green space rooftops cost on average 5 times more than a regular roof. At first, this may seem like it isn't worth it, however the pros of this solution far outweigh the limitations, as the price of promoting ecological urban growth is priceless since it is a crucial development in a rapidly growing city. It ensures that biodiversity exists and doesn't die off, since urban developments drastically reduce green space in urban cities

like New York. Therefore, this solution is viable in giving these pigeons access to a reliable food source, which in turn reduces disease contamination amongst the pigeon population in New York City

## **Conclusion**

Rapid urbanization in New York City drastically affects the Common City Pigeon. Through the lack of access to healthy and nutritious foods, these birds feast on contaminated garbage. In turn, it leads to the rapid infection and spread of diseases. This leads to a decline in the pigeon population, which is a deficit to the city. Since these pigeons are important in the contribution to ecological growth. Therefore, the solution of rooftop green spaces effectively works in saving the population. Thus, solving the issue at hand.



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