

Management of Gray Squirrels and People In a Downtown National Park

By David A. Manski

Wildlife in urban areas are often mixed blessings to park management. On the one hand, they present many educational and recreational opportunities because of their high visibility and habituation to man. Yet these same species also can damage park vegetation and structures and may even be health hazards to the visitor. Unfortunately, practical strategies to encourage or discourage wildlife in cities are not widely available. Additionally, the factors that can affect downtown wildlife programs and policies are not well known to urban land managers.

This lack of information became apparent to the managers of Lafayette Park, a national park in downtown Washington, D.C., after unsuccessful attempts had been made to resolve a gray squirrel problem. For a number of years gray squirrels at the park had damaged vegetation. While economic losses were important, the aesthetic decline of the park vegetation was of utmost concern, since many people visit the park for its historical significance and proximity to the White House. In the past, squirrels were relocated to areas outside the city with the goal of reducing the damage. However this relocation program eventually was halted because of adverse criticism from local citizens and animal protection groups and the subsequent news coverage.

In an effort to help resolve this problem, the University of Maryland and State University of New York, Syracuse, joined forces with the NPS Ecological Services Lab in D.C. to investigate the activities and population dynamics of the park squirrels. This article summarizes our initial results from March-November 1980, and discusses some of the social and biological constraints governing urban squirrel management.

Lafayette Park is an 8.2 acre park across Pennsylvania Avenue from the White House. Sidewalks around the perimeter and in the park comprise 34 percent of the area, while nearly 50 percent of the park is manicured turf and a few flower beds. The 191 trees and shrubs in the park consist of 30 native and exotic species such as willow oak, American elm, magnolia, ginkgo and horsechestnut.

Using the largest number of squirrels seen and recorded during counts within a month, the squirrel density at Lafayette Park ranged from 9 squirrels/acre in March to 20 squirrels/acre in November. These gray squirrel densities are the highest reported in the literature, probably as a result of the tremendous quantity of food distributed to the squirrels by the public and the large number of artificial squirrel nest boxes in the park.

Despite diverse types of human activity in and around Lafayette Park (joggers, police sirens, demonstrations, etc.) there was no apparent difference in the squirrels' activity patterns from those reported in more natural areas. During spring and summer, squirrels were most active in the early morning and late afternoon, resting during midday. In the fall, peaks of activity were increasingly moved toward midday.

No previous studies of gray squirrel food habits revealed a population as dependent on foods obtained from the public, referred to as supplemental food, as the Lafayette Park squirrels. Peanuts, a supplemental food, were the most important food between March



Peanuts please urban squirrels and the public is always more than glad to oblige.

and November, comprising 35 percent of all items eaten. Other supplemental foods included English walnuts, chicken bones, oak acorns, and peach pits. However, none of these and the other 26 different items eaten by the squirrels during this period accounted for more than 4 percent of the diet.

All four streets bordering Lafayette Park were crossed by gray squirrels. Movements to and from the park appeared to be of two types. Most commonly squirrels living adjacent to Lafayette Park entered the park for daily use of its resources, such as to obtain peanuts. The other kind of movement seemed related to the dispersal or emigration of squirrels from surrounding areas.

Squirrels were responsible for some of the damage to park vegetation between April and November. After leaf emergence, squirrels constantly pruned trees in order to construct and maintain the large number of leaf nests in the park. Consequently, many park trees showed visible signs of stress, such as defoliated crowns and sparse canopies. Squirrels also damaged trees by gnawing on bark. Damage to tulips and geraniums was not as severe as reported in past years.

One of the most important interactions between park visitors and the squirrels, was public feeding. We differentiated between two types of people that fed squirrels, using the analogy of "zoo visitor" and "zoo keeper" to describe them. "Zoo visitors" were commut-

ers or tourists who fortuitously fed squirrels. They usually only fed squirrels that moved near them and typically watched the squirrels eat the food thrown to them. Contrastingly, the "zoo keepers" routinely visited the park specifically to feed the squirrels. They placed food throughout the park, whether or not squirrels were visible and usually did not watch the squirrels eat. We documented at least six individuals who fit the "zoo keeper" category. Approximately 90 percent of the squirrels' supplemental food was attributed to these six people.

Two "zoo keepers" activities merit description, to illustrate the tremendous commitment of these people toward the park squirrels. These two distributed food at least six days a week in the winter and five days a week during other seasons. During warmer months they placed a total of nearly eight pounds of raw peanuts in the park each visit, and during the winter, they doubled this amount. Thus over a year, these two "zoo keepers" together distributed nearly 3000 pounds of peanuts for the squirrels. At the July 1980, wholesale cost of peanuts, each "zoo keeper" spent \$855.00 on the park squirrels.

Peanuts distributed in the park for squirrels were generally in surplus and were consumed by other park wildlife. For example, in July and August, pigeons and common grackles ate approximately 20 percent of the peanuts intended for squirrels. Rats also have been observed eating peanuts put out for squirrels. Thus park "zoo keepers" not only supported squirrels but also some species considered pests in urban areas.

Most people using the park did not come specifically to see the squirrels. Nevertheless, after arriving, many of these people photographed the squirrels and enjoyed their presence. It was our impression that when squirrels were active and visible in the park they were the third most popular sight after the White House and park statues.

Management Implications

Based on these and other results, we can assume several factors that can influence management efforts to maintain a healthy park. Reducing the number of park squirrels is one strategy that may help minimize damage to vegetation. However, removal of park squirrels will have no lasting effect on lowering the high squirrel density. Continual reproduction by the remaining squirrels and movement of squirrels into the park from adjacent areas, eventually will increase the population to the carrying capacity of the park. The carrying capacity at Lafayette Park is higher for gray squirrels than in other similar sized areas because of the large quantity of supplemental foods. For removal alone to be effective, a continuing effort would have to be carried out at least twice a year. A more efficient and long lasting method would be simultaneous removal of squirrels and reduction of supplemental foods.

Prohibition of public feeding in the park would lower the park carrying capacity for squirrels, rats and pigeons, but also probably would cause an initial increase in squirrel damage to park vegetation. Sudden elimination of peanuts might cause squirrels to compensate for the absence of this food by feeding on trees, shrubs and flowers. Park visitors who feed

squirrels for enjoyment would be denied an important component of their park experience. This policy also would be very difficult to enforce.

The keen interest and concern for the squirrels by some of the public may at times interfere with other interests in the park. Programs perceived as harmful to squirrels, such as relocation and prohibition of public feeding, would be intensely opposed if not legally challenged. Thus park management should be aware that strategies to reduce squirrel-park conflicts will be continually scrutinized by the public and may prove difficult to implement.

At this point in our study, the following management approaches seem to hold the most promise for reducing future damage to park vegetation, improving relationships between park management and the public, and enhancing a healthy park ecosystem:

1. Since damage to park vegetation rather than the presence of squirrels is the major concern, the greatest effort should be directed at minimizing damage. This may be accomplished by not planting certain flowers, such as geraniums, known to be damaged by squirrels. Efforts also can be made to spray repellents on flowers to discourage their use by squirrels. Preliminary results at the park suggest that a mixture of hot chili sauce, water and a sticking agent is sometimes effective in reducing flower damage. Metal guards can be placed around the trunks of the isolated

trees to prevent squirrel movements into the branches where most bark and twig damage occurs.

2. Efforts should be initiated to reduce the surplus peanuts in the park. This might be accomplished by meeting with those zoo keepers who daily feed squirrels large quantities of peanuts and informing them that distribution of peanuts only when squirrels are visible and at least one hour before sunset will increase the probability that they will be eaten by squirrels and not by other animals. Waste also would be reduced if squirrels were fed individually, rather than by placing food at the base of trees. These efforts not only could reduce the amount of food available to rats and pigeons, but also would save the squirrel benefactors' money.

3. A long range management goal of the park could be to enhance wildlife habitat. Trees that are valuable to squirrels as well as park aesthetics should be planted, so that in the future they could possibly replace peanuts as important squirrel food. A smaller number of squirrel nest boxes would be required in the park, if dead tree limbs that contain cavities were routinely cut or pruned only if dangerous to the public.

4. If vegetation damage continues and management decides to reduce squirrel numbers, euthanizing the removed animals should be considered. This would be more humane than releasing them into areas, where they may have little chance for survival.



Bark damage on beech tree in Lafayette Park, caused by squirrels gnawing and sometimes eating the moist, spongy, loosely cellular cambium on both the inner bark and exposed wood of stripped trees.

However, regardless of how "humane" this may be, squirrel benefactors and others may criticize the Service severely for killing squirrels. Whenever squirrels are removed, there must be a concurrent reduction of supplemental foods.

5. Because squirrels are of great interest and concern to the public and park management, the development of an interpretive program at the park would be of value. Brochures and/or bulletin boards could present information on the park squirrels' habits and how they compare to squirrels in more natural areas. The best time of the day in each season in which to observe, photograph and feed the squirrels could be discussed. People also could be informed of the safe, proper ways of feeding squirrels, and the role of public feeding in the park ecosystem. Park managers could voice their concerns about past and future squirrel problems, as well as promote their efforts to improve park conditions for the squirrels. These actions would help demonstrate to the public that the park management is concerned with squirrels not only as pests, but as a valuable park resource.

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