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Author

Marion, Wayne R.

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URBAN WILDLIFE: CAN WE LIVE WITH THEM?

WAYNE R. MARION, Department of Wildlife and Range Sciences, University of Florida, Gainesville, Florida 32611-0301.

ABSTRACT: A survey of Extension Wildlife Specialists in the U.S. provided a basis for estimating the magnitude of urban wildlife damage and control in this country. Response to the 9-question mail questionnaire was good (76 percent) following the single mailing to all Extension Wildlife Specialists or people in similar positions listed in the national directory. The majority of questions were answered based upon the experiences and best estimates of these specialists for the interval October 1986-September 1987. Specialists had difficulty providing estimates of damage and costs of prevention and control; 57 percent were not able to provide any data on these topics. Several of the questions dealt with attitudes of people requesting urban wildlife information and/or assistance and wide ranges of responses were received to most of these questions. Most people (78 percent) appeared willing to implement prevention/control measures recommended by these specialists, more than half (61 percent) wanted the animal handled/removed by someone else, and only about 40 percent wanted the damage stopped regardless of cost. Also, slightly over half (55 percent) of clientele represented did not want the offending animal harmed in any way. These results were highly variable from state to state. Several differences were noted in overall responses regarding urban wildlife species. Requests for information were received most frequently for bats and snakes, but both of these groups of animals ranked very low in terms of actual damage reported. The most frequently mentioned groups of animals causing damage in urban areas were roosting birds (including pigeons, starlings, and sparrows), woodpeckers (especially flickers), tree squirrels, bats, and moles. In terms of actual dollar values of damage done, white-tailed deer and pocket gophers apparently caused the most estimated damage. Due to these differences, it is necessary to know which criteria are being used to make an assessment of the relative importance of animal damage control problems. Techniques for controlling urban wildlife damage, such as exclusion, live-trapping, repellents, and poisons, are compared and discussed in some detail in this paper. As urbanization occurs across the nation, concerns about urban wildlife damage will continue; in most cases, we can and will live among these creatures.

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INTRODUCTION

Urban wildlife enhancement and control are relatively new areas of wildlife management involving elements of wildlife population regulation, habitat manipulation, and education and management of people. Urban wildlife enhancement is the subject of several publications and efforts, particularly in the eastern U.S., intended to inform people of ways to preserve or improve the attractiveness and value for wildlife of portions of the urban landscape. Control of urban wildlife has not been widely publicized and is generally not a favorite activity of Extension Wildlife Specialists and pest control operators. This paper will describe and discuss urban wildlife control from the perspective of the collective experiences of Extension Wildlife Specialists nationwide.

Before beginning an in-depth discussion of the survey conducted and the results, it seems appropriate to clarify several points about urban wildlife and the people filing complaints about them. It is important to remember that a wild animal becomes a nuisance or causes damage primarily when it becomes locally abundant or is "out-of-place" according to the human neighbors. Further, with urbanization occurring at a rapid rate in many areas, it is frequently the case that people have "moved in on" wildlife and not vice versa. Oftentimes, this situation provides an opportunity to educate the public on the positive aspects of having wildlife in their neighborhoods, but this rarely appeases the person incurring damage. The distinctions between urban wildlife and rural

wildlife problems are becoming more obscure as suburbs expand into surrounding agricultural areas.

As much as possible, prevention of damage should be promoted since it is frequently easier and cheaper to prevent wildlife damage than it is to control it once it has started. Where actual damage is occurring, an objective assessment of the extent and approximate cost of the damage is useful to avoid an over-reaction by a homeowner in panic. Control efforts should be directed at individuals actually doing the damage if they can be identified and a minimum effective control strategy should be used. In other words, if one or a few individuals are causing most of the damage, it should not be necessary to direct your efforts toward the entire local population of that species. The distinctions between actual damage (real problem) and nuisance situations (perceived problem) are useful in this context. Many problems fall into a nuisance category--where there is minimal actual damage occurring but the presence of the animal arouses the curiosity or concerns or both of the nearby humans. A bat flying over a swimming pool in the evening or roosting in an open garage provides a good example of a nuisance situation. Problems like this often provide a prime opportunity to inform and educate the public about the benefits (i.e., they serve as biological control agents for flying insects) of this species or group and to avoid any undue harassment of animals.

The attitude and sensitivity of all parties are important elements in effectively dealing with urban animal damage.

Maintenance of a sense of humor while still remaining sensitive to public fears and concerns are goals worth striving for in handling urban wildlife damage. Usually, several carefully worded questions at the beginning of a dialogue about the problem will provide clues about the knowledge level and landowner concerns. In some cases, fears and anxieties associated with unfamiliar situations and species may be reduced in magnitude by providing factual information and assurances to homeowners. Whenever possible, nuisance aspects of urban wildlife should not be exaggerated since it is not in the best interest of the resources to do so. Also, it is useful to become familiar with people's concerns over the issue of killing of animals as this may influence the choice of control techniques. Use of discretion in the handling of animals is normally a good practice regardless of the fate of the animal.

THE NATIONAL SURVEY

A mail questionnaire was developed and sent to all Extension Wildlife Specialists or persons in similar positions whose names and addresses were available in the latest directory of state extension specialists prepared by the USDA Extension Service. Nine major questions were included that explored topics related to urban wildlife damage control for the interval October 1986 through September 1987. These topics related to wildlife species of greatest interest to urbanites, extent and associated costs of actual damage caused by urban wildlife, specific problems caused, suggested prevention/control techniques, and public attitudes regarding urban wildlife control. Public attitudes were explored using questions regarding willingness to implement recommended prevention/control techniques, willingness to tolerate some damage due to high costs of control, and preferences in handling the offending animal. All data gathered were estimates by Extension Specialists of the clientele they serve and were combined by species and control technique.

RESULTS AND DISCUSSION

Response to the survey of Extension Wildlife Specialists nationwide was excellent as 26 out of 34 states (76 percent) returned completed questionnaires after only one solicitation. There was no follow-up solicitation due to this level of initial response. In those cases where there was no response, there often were extenuating circumstances such as states having no Extension Wildlife Specialist to handle these requests. There were no obvious trends in locations of states that either did or did not respond and it was felt that these data were representative of the nation. There were regional differences in the types of responses and emphasis, depending upon the extent of urbanization and the wildlife species present. For example, armadillos are a much bigger problem in the south than they are elsewhere simply because of their range; in the north, species like chipmunks and woodchucks provide the excitement!

Urban wildlife tend to stimulate both the curiosity and concern of people living nearby, and Extension Wildlife

Specialists are called upon frequently to provide information about these animals. These specialists identified 25 categories of vertebrates that were the subjects of many requests for information: most frequently mentioned were bats (19), snakes (16), tree squirrels (16), and roosting birds such as pigeons, starlings, and sparrows (14). Also listed were woodpeckers (especially flickers) (12), moles (12), striped skunks (12), raccoons (9), rats/mice (6) and 16 other groups mentioned infrequently. It is interesting to note that two groups of animals normally feared by people, bats and snakes, are right at the top of the list in terms of requests for information, but they both rank considerably lower when actual damage is involved.

When actual damage caused by urban wildlife was considered, 29 groups of birds and mammals were mentioned including roosting birds (pigeons, starlings, sparrows) (17), woodpeckers (15), and tree squirrels (14). Also, damage was reportedly caused by bats (10), moles (10), rats/mice (9), rabbits (7), raccoons (7) and 21 other categories of warm-blooded vertebrates. It is important to note that these results are summarized over responses received from across the nation, and it is very likely that major problems can and will develop locally involving urban wildlife species other than those listed above. For example, white-tailed deer feed heavily on shrubs and yew bushes in urban areas during winter causing a great deal of damage.

Specific problems caused by urban wildlife included a number of types which were combined into five major categories, including causing physical damage to property, feeding on plants/shrubs, creating a nuisance, presence in or near homes, and soiling/defacing of property. Physical damage to property could describe a variety of problems including digging/burrowing in yards and gardens, gnawing or pecking holes in structures, etc. Feeding normally referred to damage resulting from the physical removal of parts, fruits, and nuts from plants of value in the yard and garden. Nuisance referred to activities that cause people anguish and frustration, even though the actual damage may not be great (i.e., raccoons tipping over garbage cans). Presence described a situation where the physical presence of certain animals in close proximity caused people concern, such as snakes in the yard or bats in the attic. Soiling/defacing usually refers to a situation where accumulations of bird or animal feces have developed resulting in unsightly/unsanitary conditions.

Results of this survey listing problems associated with the most frequently mentioned species are shown in Table 1. Here, the physical damage associated with woodpeckers, tree squirrels, and moles seems to be foremost in the minds of the specialists surveyed (Table I). Damage due to feeding was commonly linked to tree squirrels, cottontail rabbits, and commensal rodents (rats/mice). Nuisance was commonly affiliated with roosting birds, bats, and raccoons. "Presence" was primarily a problem associated with bats, and soiling/defacing was typically associated with roosting birds (especially pigeons).

Table 1. Urban wildlife problems identified by Extension Wildlife Specialists in the United States, 1986-87. Numbers represent the number of specialists who listed the problem as being significant.

Species	Physical Damage	Feeding	Nuisance	Presence	Soiling
Woodpeckers	15	1	4	-	-
Roosting birds	6	2	6	4	18
Tree squirrels	13	8	1	2	-
Moles	12	1	-	-	-
Rats/Mice	8	6	1	-	-
Bats	-	-	6	7	3
Raccoons	3	4	6	-	-
Cottontails	-	7	-	-	-

The dollar values associated with urban wildlife damage were, as expected, difficult to estimate. Of the 26 Extension Wildlife Specialists that responded to the survey, more than half (57 percent) could not provide estimates regarding the economic impacts of urban wildlife damage in their states. These estimates are difficult to derive since there is no standardized system for evaluating or recording these costs. Respondents were asked to estimate the total value of damage caused by each of the major species mentioned for their state and an estimate of the amounts spent on prevention and control. Since more than half of the participants did not answer this question, the estimates summarized in Table 2 should be considered very conservative. Total damage estimates represented the sums of N estimates submitted for that species; the average estimate was calculated by dividing the total estimate by N. In nearly all cases, damage (D) and prevention and control (P+C) estimates were highly variable among respondents. A further calculated statistic represented the ratio for that species of D/P+C. This ratio reflects the relationship between the actual damage and attempts to reduce or mitigate the damage. Higher values (> 5) of this ratio indicate that money spent on prevention and control are lagging far behind costs of the damage and that the situation may be "out of control."

Estimated values of damage caused by white-tailed deer (\$30.6 million) and pocket gophers (\$5.2 million) significantly overshadowed estimated values for other species mentioned (Table 2). The ratios of damage to prevention and control also were high for these two species indicating that, with current resources allocated to the problem, it very likely will not be possible to control the damage being inflicted by

white-tailed deer and pocket gophers. Similarly, this is probably also the case with moles, woodpeckers, roosting birds, and bats (Table 2). This table is especially interesting in the context of other results of this survey (e.g., Table 1) where white-tailed deer and pocket gophers were not mentioned frequently enough to be listed as major problem species. One must conclude that, where these two species do cause urban damage, the damage is significant.

Table 2. Summary of estimates of total economic damage (D) and average economic damage ($\bar{D}$) for various urban wildlife species. The ratio of D/P+C represents the relative financial commitments (< 3 = high, > 5 = low) to controlling damage.

Species	N	Damage (D)	$\bar{D}$	Ratio of D/(P+C)*
White-tailed deer	5	\$30.6 M ^b	6.1 M	7.4
Pocket gophers	4	5.2 M	1.3 M	18.2
Rats/Mice	5	2.7 M	540,000	1.5
Tree squirrels	4	2.0 M	512,000	3.4
Roosting birds	11	2.0 M	184,000	7.5
Woodpeckers	7	1.0 M	144,000	7.9
Raccoons	2	1.0 M	506,000	1.7
Armadillos	4	1.0 M	245,000	1.1
Bats	6	840,000	139,000	6.4
Moles	4	600,000	150,000	9.7
Rabbits	3	60,000	21,000	2.3

*P+C = Dollar value estimated for prevention and control.

^bM = millions of dollars.

As part of the survey, specialists were asked to list recommended techniques for controlling wildlife pests and to assess the relative effectiveness of each of these (Table 3). The most frequently mentioned technique was exclusion or structural modification (using screening, netting or fencing) to restrict access of animals to buildings, yards, gardens, etc. Exclusion was believed to be a particularly effective technique when used to block access by woodpeckers, roosting birds, tree squirrels, bats, raccoons, and rabbits. Exclusion methods should be used as soon as possible after damage is noticed (or before if damage is anticipated) since the problem may really get out of control if damage initially is ignored or goes unnoticed. Being innovative and persistent with nearly all of these techniques or combinations of techniques will help to ensure success.

Table 3. Urban wildlife damage control techniques recommended by Extension Wildlife Specialists and their relative effectiveness.

Species	Techniques Employed	Relative Effectiveness ^a
Woodpeckers	Exclusion-screening (10 ^b)	M - H
	Shooting (with permit) (5)	H
	Fright devices and noise (8)	L
Roosting birds	Exclusion - screening (10)	M - H
	Poison (Avitrol) for Pigeons (4)	H
	Eliminate roost areas (4)	M
	Fright devices (7)	L - M
Raccoons	Exclusion (7)	H
	Trapping (5)	H
Rabbits	Fencing for exclusion (7)	H
	Live-trapping (4)	H
	Repellents (4)	M
Rats/Mice	Trapping (6)	M - H
	Poison (5)	H
	Exclusion (5)	M
Tree squirrels	Trapping (12)	H
	Exclusion (11)	H
	Repellents (5)	M
Bats	Exclusion (10)	H
Moles	Trapping (10)	M
	Reduce food supplies (3)	M

^aRelative effectiveness assessed by specialists as H = high, M = medium, and L = low.

^bNumbers in parentheses represent the number of specialists recommending the technique to deal with the problem species.

Trapping (using either live-traps or kill devices) was consistently recommended for control of tree squirrels, moles, rats/mice, rabbits, and raccoons. In many cases, live-trapping and moving of animals appears to have broader appeal for the urban public than the use of devices that kill the animal. Moving and releasing the animal may not be the best solution since you may just be moving the problem to a different location, additional handling of the animal increases threats to human safety, and chances for the animal to survive in an unfamiliar area are typically reduced. Also, homing instincts are great in animals; if you plan to move one, move it to a distant location several miles away for release rather than nearby.

Frightening devices and noisemakers have been tried repeatedly to control damage from woodpeckers and roosting birds with only limited success. These techniques are nor-

mally only temporarily effective until the birds quickly acclimate to this disturbance. Irregular timing and magnitude of the disturbance along with persistence may lead to improved success using these methods. Poisons have been used with success in controlling rats and mice (TALON[®] is one type of anticoagulant poison) and pigeons (AVITROL[®] is effective but should be used cautiously due to public reaction to dead and dying birds). Repellents have been used with moderate success for tree squirrels and rabbits according to the results of this survey. Numerous other techniques are available for controlling these and other animal pests. Noteworthy references that provide additional information include Marion (1980, 1984, 1985), Goodwin (1982), Decker (1983), San Julian (1984), Salmon and Lickliter (1984), Bromley (1985), and Marion and Thompson (1985).

Several additional questions were posed to the specialists included in this survey in an attempt to reveal the attitudes and moods of people contacting these specialists about urban wildlife problems. One such question was "What proportion (%) of people requesting assistance appear to be willing to implement prevention and control measures as advised?" The average response to this question was positive with an estimated 77.9 percent of clientele in 26 states being willing to implement the suggested techniques. Another question in the survey was "What proportion of people requesting assistance want the damage stopped regardless of cost?" Here the responses were more variable than for the previous question and the average estimated percentage for 26 states was 40.2. In general, it appears that most people were fairly reasonable about the costs of animal damage control.

Responses to the question "What proportion (%) of people who contacted you regarding urban wildlife problems do not want the animal to be harmed?" also were highly variable for the 26 states that responded. The overall average indicated that slightly more than half (54.7 percent) of the people did not want harm to come to the animal causing problems. The final question was "What proportion of people requesting assistance want the animal removed by someone else?" which touches on the issue of who is really responsible for urban wildlife damage control. More than half (60.8 percent) of respondents, on average, indicated a desire to have animal damage handled by someone else (often from a public agency). Results of these questions were both interesting and not too surprising since people are beginning to recognize that there may be significant problems associated with wildlife in urban areas. The evidence is overwhelming that many types of wildlife will continue to cohabit urban areas with us and the challenge remains for us to develop a proper perspective on these relationships.

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*Note: The use of brand name is not intended to constitute an endorsement of this product.

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