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Wildlife Damage



N E W S

Volume 2, Winter 1991

Co-editors: Paul Curtis and Michael Fargione

Produced by: Carol Rundle

Beaver Management and Damage Control

by Paul Bishop, NYS Department of Environmental Conservation

Spring glorious spring! Buds bursting, birds singing, the ground covered in a brilliant green carpet, and oopsflooded fields and roads. Yes, along with the welcome signs of spring comes another not-so-welcome phenomenon. Spring is one of the peak times for beaver problems each year. Snowmelt runoff, spring rains, and renewed beaver dam-building activity combine to flood crop lands, septic fields, and roads. Timber, or ornamental trees and shrubs, may be damaged by beaver chewing, or killed by the higher water table. What can be done if this happens to you? Who can help? Are beavers good for anything? Let's explore the answers to these questions.

First, there is a positive side to the beaver. All wildlife species have value as members of complex animal and plant communities. But beyond that, beaver have more impact on these ecological systems than any species besides man. Beavers create open, shallow-water impoundments, frequently in otherwise forested cover. These changes benefit many species of wildlife associated with wetlands including ducks, wading birds, and songbirds, as well as various mammals, amphibians and reptiles. Several researchers have recommended maintaining beaver populations at the highest level possible in order to maximize the benefits for waterfowl.

However, beavers can and do cause serious problems. These animals can be likened to morning glories, highly desirable in the right place, but a real problem in a cornfield. As in real estate, location is everything! The New York State Department of Environmental Conservation (DEC) Bureau of Wildlife strives to balance the benefits and costs of the state's beaver populations. Within the limits imposed by fur prices, which influences trapping pressure, trapping is the primary tool for maintaining beaver numbers at levels compatible with the desired land use.

Regardless of beaver numbers, there are always places where they cannot be tolerated. While DEC is not legally liable for wildlife damage, DEC staff assists landowners with beaver problems. However, other duties may limit the assistance your wildlife unit can provide. In 1990, more than 1,700 beaver complaints were received by DEC's regional wildlife units statewide. DEC Regions 4, 5, 6, and 7 have the highest numbers of problems.

If you are confronted with nuisance beavers, call the nearest DEC regional wildlife unit. What can be done depends on your particular situation. Sometimes information on beaver, their impacts on local wildlife, or other biological information is all that is needed. Biologists can also provide advice concerning the protection of ornamental trees with page wire fencing.

At other times, much more effort may be necessary. For example, a landowner may be quite happy to have a beaver pond if the water level can be lowered to a tolerable level. A device can be placed in the dam to maintain the water at the desired level. These devices may also be used to protect plugged road culverts, a beaver problem frequently encountered by highway crews.

Sometimes standing water cannot be tolerated, and the dam must be destroyed to drain the impoundment. If a dam must be removed or disturbed, or a beaver killed, you are required by law to obtain a DEC

Table of Contents

Beaver Management and Damage Control	page 1-2
Rabies Update 1990	page 2-4
Wildlife Rehabilitators Exam Offered	page 4
Coyote Management in Northern New York	page 4
Current Literature	page 5
Potential Reregistration of Mesuro?	page 6
Guidelines for Agents Recommending "Home Remedies"	page 6
New Deer Management Video Available	page 6
Current Literature	page 7-8
Living with Wildlife	page 7
Study Models Deer-Damage Control Decisions by Orchardists	page 8

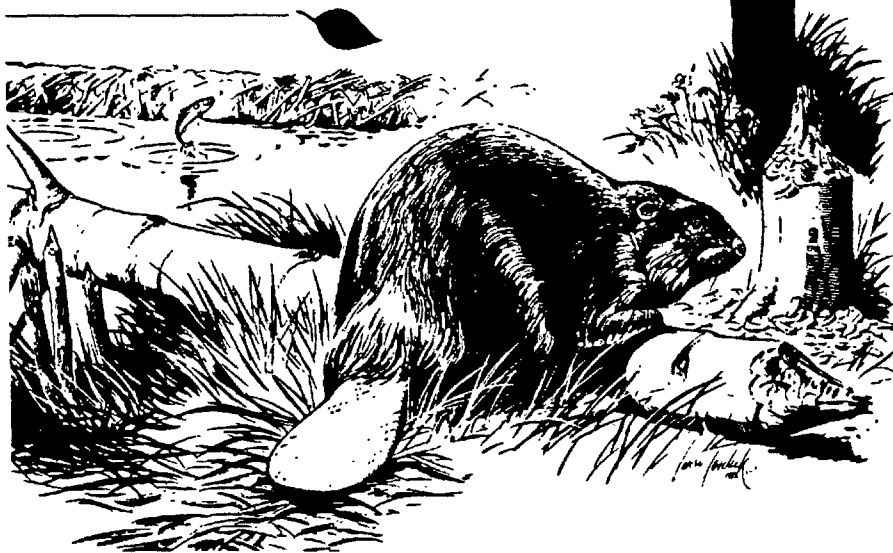
This is a quarterly publication of the Cornell Cooperative Extension Wildlife Damage Management Program.


(Beaver Management con't.)

permit. This law recognizes that beavers have positive values, and these animals should be conserved. Because the water level control devices mentioned above are inserted in the dam, a permit to disturb the dam is required. DEC can provide technical advice concerning installation of a water level control device, or dam removal. When staff and funds allow, DEC may assist in installing a device.

Resolving beaver problems on your land may require action on someone else's property (e. g., the dam creating the problem impoundment is on a neighbor's land). In such cases, DEC will issue you a permit to take the necessary action. However, the permit does not authorize you to trespass in order to carry out these actions, and the appropriate landowner's permission must be obtained.

If you become the owner of a new beaver pond this spring, I hope that you will be able to appreciate the positive values of this unique habitat. If the flooding or tree damage becomes intolerable, contact your regional wildlife office for information and assistance.



 This publication is also available on the CENET Damage News BulletinBoard.

Rabies Update 1990

reprinted from *Epidemiology Notes*, Vol. 5, No. 9, NYS Department of Health, Division of Epidemiology

The beginning of the decade of the 1990's has witnessed a dramatic change for rabies in New York State. The mid-Atlantic raccoon rabies epizootic, which entered New Jersey from Pennsylvania in the fall of 1989, entered New York State in two areas in the spring of 1990—Steuben County from central Pennsylvania and Sullivan County across the Delaware River from eastern Pennsylvania and New Jersey. Additionally, the re-emergence of fox rabies from Canada occurred this year on the Quebec border of Franklin County, the first case in the north country since early 1987.

In 1989, the confirmed cases of rabies were limited to 54 bats statewide. It was also the first year since 1940 that a terrestrial animal was not confirmed rabid in New York. Bat

rabies continues to be a problem throughout the state, but the incidence has remained constant over the last 20 years, as 2-5 percent of the bats submitted for rabies examination are confirmed rabid each year.

The Mid-Atlantic Epizootic

The mid-Atlantic raccoon rabies epizootic has been an interesting yet tragic tale of human manipulation of wildlife. Since the 1950's, raccoon rabies has been a problem limited to the southeastern portion of the United States. Between 1977 and 1981, over 3,500 raccoons were imported with legal permits into Virginia from Florida. The first rabid raccoon in the mid-Atlantic outbreak appeared in West Virginia in 1977, and three more were confirmed rabid in Virginia in 1978. Since then, about 9,000 raccoons, as well as other wild and domestic animals, have been found rabid (as of December 31, 1989) from Virginia, West Virginia, Maryland, Pennsylvania, Delaware, New Jersey and the District of Columbia. Raccoon rabies has now spread to New York State.

Between 1987 and the end of 1989, 2,925 raccoons were confirmed rabid in the states involved, demonstrating the immense impact the raccoon rabies outbreak has had in this part of the country. During this time, rabies cases in these states occurred in 188 foxes, 546 skunks, 39 groundhogs, 19 horses, 46 cows, 176 cats, 22 dogs and one or more cases in pigs, sheep, goats, rabbits, bobcats and deer.

The first rabid raccoon in New York from the mid-Atlantic epizootic was diagnosed on May 4, 1990, in the town of Addison, Steuben County. It was 2 1/2 months before the next case was reported in Steuben County. Sullivan County had a rabid raccoon confirmed on July 3, with four more cases over the next few weeks. At the end of September, the raccoon epizootic intensified. Sullivan County had 23 rabid raccoons, 6 rabid skunks, and one rabid fox. Raccoon rabies now exists in four more counties: Chemung, Allegany, Cattaraugus, and Orange. The Steuben

(Rabies Update 1990 con't.)

County cases are expected to remain sporadic before becoming established in the raccoon population. The situation along the Delaware River may become more dramatic since the raccoon populations in suburban areas are more dense than the populations found in farm country. The threat of raccoon rabies from either side of the river exists (for the counties of Sullivan, Orange and Delaware), with the whole southern Hudson River Valley potentially threatened by a spread from New Jersey.

The importation of animals incubating the disease could also become a contributing factor in the spread of rabies. On June 16, a cat was found rabid on the upper east side of Manhattan. The cat had been brought to New York City from the owner's summer home in Pennsylvania.

Rabies in Northern New York State

The reintroduction of fox rabies into northern Franklin County has some interesting aspects. First, the spread came from Quebec rather than southern Ontario where fox rabies is epizootic. Furthermore, the cases were concentrated in two small townships on the Canadian border until late summer, when cases appeared in adjoining townships. This probably reflected the movement of young born in 1990 into new areas. There have been 29 foxes, 7 skunks, and 7 cows confirmed rabid during 1990 in Franklin County. The cattle cases have resulted in over 25 people being given post-exposure rabies prophylaxis. It is expected that Franklin County will spend over \$15,000 in human rabies treatment this year.

Preventive Efforts

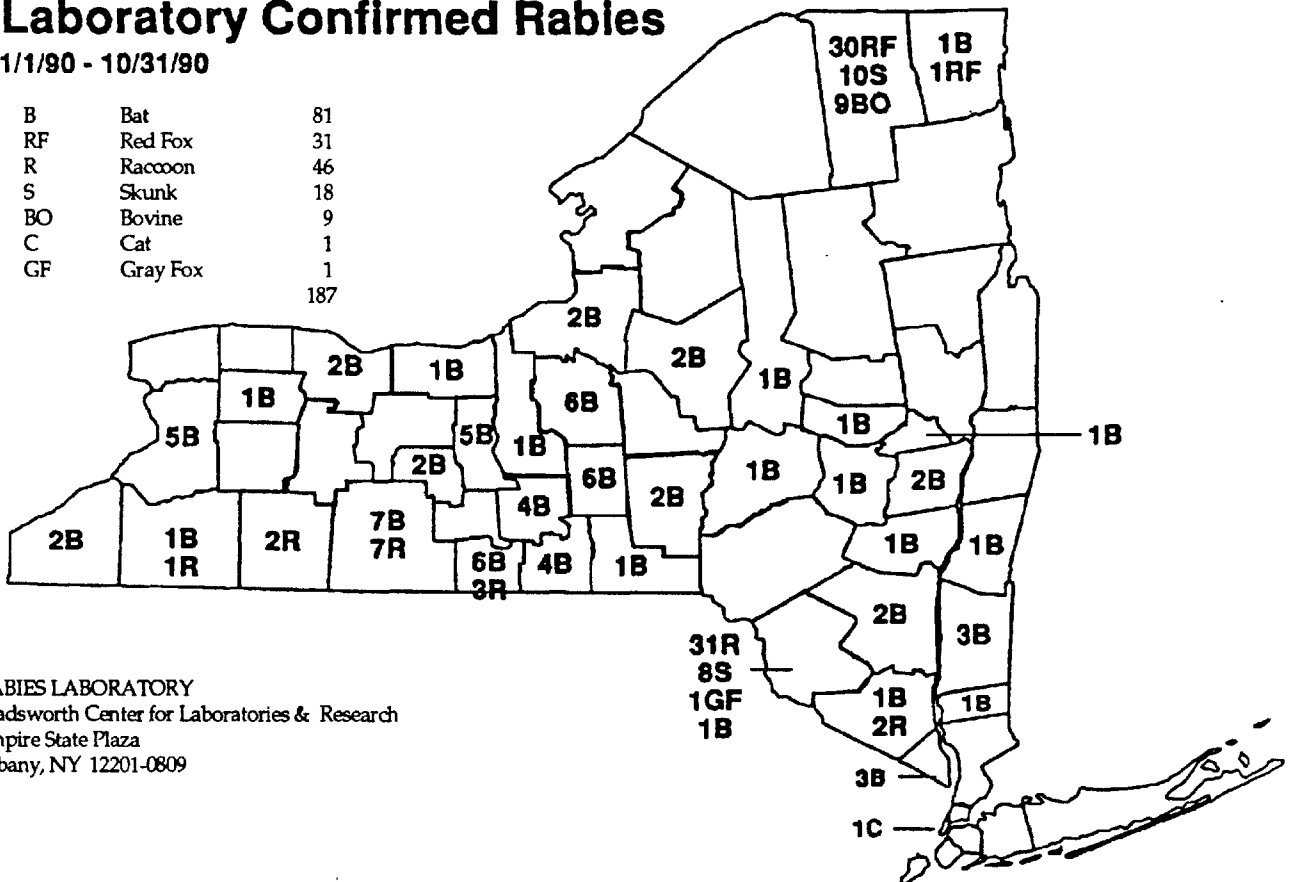
The rabies situation in New York State this year requires constant surveillance and public education. Thirty-one of the 62 counties in New York require rabies vaccination of dogs for licensure pursuant to Section 2145 of the Public Health Law. Eight of these 31 counties opted for this mandatory vaccination program when threatened by raccoon rabies. An additional five counties are now contemplating the program. Additionally, an emergency amendment to the New York State Sanitary Code was adopted on October 22, 1990, requiring compulsory cat vaccination against rabies in those counties where rabies has been confirmed in raccoons.

Physicians and other health care providers are advised to be aware of the rabies situation in their area. Since bats are considered rabid until proven negative, all bat bites should warrant

Laboratory Confirmed Rabies

1/1/90 - 10/31/90

B	Bat	81
RF	Red Fox	31
R	Raccoon	46
S	Skunk	18
BO	Bovine	9
C	Cat	1
GF	Gray Fox	1
		187



RABIES LABORATORY
Wadsworth Center for Laboratories & Research
Empire State Plaza
Albany, NY 12201-0809

(Rabies Update 1990 con't.)

immediate post-exposure treatment unless the specimen can be delivered to the rabies laboratory for examination without delay.

Each decision concerning post-exposure rabies treatment for any animal exposure rests with the patient and the attending physician. Consultation and information on submitting specimens is available from local health units, the Bureau of Communicable Disease Control at (518) 474-3186, the Rabies Laboratory at (518) 869-4527, and during off-duty hours, through the Department of Health Duty Officer at (518) 465-9720.

Wildlife Rehabilitators Exam Offered

NYS Department of Environmental Conservation

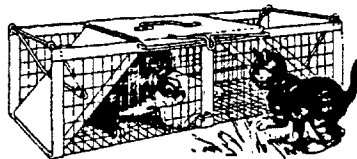
A written examination for New Yorkers wishing to become licensed volunteer wildlife rehabilitators has been scheduled for Friday, March 15, 1991. The exam will be held from 10 am. to 12 noon at designated DEC regional offices. Applicants must pre-register for this exam before February 28, 1991. The exam will only be offered once a year.

"Wildlife rehabilitation is a relatively new activity involving wildlife," stated Commissioner Thomas Jorling. "It involves providing care for injured, sick, and distressed wildlife. The ultimate goal of wildlife rehabilitation is to provide the necessary care so that the animals can be returned to the wild where they belong."

"Individuals wishing to become licensed volunteer wildlife rehabilitators should be aware that a certain degree of technical skill and a significant commitment in time, money, and effort is required. Prospective applicants are encouraged to "apprentice" with a licensed wildlife rehabilitator to gain experience."

The wildlife rehabilitation exam is one step in the application process to obtain a Wildlife Rehabilitation License. In addition to receiving a score of 80 percent or higher on the exam, the applicant must be at least 16 years of age, submit two character references, not have been convicted of a violation of the Environmental Conservation Law, and be interviewed to assess the applicant's proficiency in wildlife rehabilitation.

Interested individuals may apply for the wildlife rehabilitation exam by contacting Chris von Schilgen, NYS DEC, Room 522, 50 Wolf Road, Albany, New York 12233-4752. Phone (518) 457-0689. Persons who apply will be sent a New York State Wildlife Rehabilitation Information Packet and a license application form. There is no charge to take the exam or for the wildlife rehabilitation license. For further information, call Arthur Woldt at (518) 457-5400.



Coyote Management in Northern New York

by Paul D. Curtis, Extension Associate

Public meetings were recently held at Watertown, Saranac Lake, Herkimer, and Ballston Spa, to provide information and obtain public input concerning future coyote management in Northern New York. These meetings are part of the response to Governor Cuomo's Directive on Coyotes. The coyote controversy emerged in the 1990 State Legislature with the introduction of the Harris/Stafford Coyote Bill. This bill would have opened the Northern Zone to year-round coyote hunting. Currently, hunting seasons for this animal are open from October to March in the Northern Zone. However, coyotes causing agricultural or other damage anywhere within NYS may be killed at any time without a

permit or license. Strong opinions for and against the bill indicated that the public was divided over the issue of coyotes as a nuisance species or valuable game animal. Governor Cuomo requested action be suspended on this bill until additional information could be obtained concerning coyote effects on deer populations and livestock, and public attitudes towards this species.

The NYS Department of Environmental Conservation, Department of Agriculture and Markets, and Cornell Cooperative Extension joined forces to coordinate the public meetings and respond to the Governor's Directive. Cooperative Extension Agents from Hamilton, Herkimer, Jefferson, and Saratoga Counties facilitated the meetings. They also conducted a question and answer session, during which a panel of coyote experts addressed public concerns related to coyote management. The DEC-Bureau of Wildlife provided an overview of NYS coyote research and management, and distributed a coyote fact sheet. Public input was obtained in group sessions and by written statements. Further written comments will be accepted by mail to the DEC Bureau of Wildlife in Albany until 1 March.

Public attendance at these meetings was outstanding. More than 500 citizens participated in the 4 coyote forums, and many people expressed their views and desires. No matter what direction future coyote management takes in Northern New York, the coyote will continue to be one of the most controversial wildlife species—hated and persecuted by some people, and defended by others. The DEC-Bureau of Wildlife and Cornell Cooperative Extension will summarize input from the public meetings, and DEC will produce a report by early April. To obtain additional coyote information, contact one of these DEC offices: Region 5 Wildlife Manager (Raybrook)- (518) 891-1370, Region 6 Wildlife Manager (Watertown)- (315) 785-2261, or Wildlife Resources Center (Delmar)- (518) 439-8082.

Current Literature

by Paul D. Curtis, Extension Associate

Bomford, M. and P.H. O'Brien. 1990. Sonic deterrents in animal damage control: a review of device tests and effectiveness. *Wildl. Soc. Bull.* 18:411-422.

Many consumers make the decision to purchase sonic wildlife control devices based primarily on manufacturer claims and testimonials from satisfied users. Most of these sonic devices have never been tested with controlled, replicated, field experiments. In 1982, 51 manufacturers of ultrasonic devices had sales of more than \$17 million in the United States. The legality of selling untested wildlife control devices is being questioned, and some U.S. companies have been ordered to give consumers refunds for ineffective products. This article is a summary of a recent review paper (*Wildl. Soc. Bull.* 18:411-422, 1990) published by Mary Bomford and Peter O'Brien, Bureau of Rural Resources, Canberra, Australia, which describes sonic device effectiveness for a variety of birds and mammals.

Sonic devices have been advertised as "scientifically sound, humane, inexpensive, and simple to operate." Bomford and O'Brien noted, "Sounds are alleged to repel animals by several mechanisms: pain; fear; communication "jamming"; disorientation; audiogenic seizure; internal thermal effects; alarm or distress mimics; and ultrasound."

Bomford and O'Brien stated that, "There is no scientific evidence that ultrasound (high frequencies above 20,000 Hz) or infrasound (low frequencies below 20 Hz) have unique properties making them more likely to repel wildlife than audible sounds." They also noted, "...behavioral experiments have provided no evidence that ultrasound can be heard by, or is meaningful to, birds. Even for pest vertebrates such as rodents, bats, and dogs which can hear ultrasound, there is controversy over its efficacy for control." Bomford and O'Brien concluded, "Many studies have

rejected ultrasound as a practical method for rodent control..." and "...ultrasound either had no effect on target species, or had only a partial and transient effect."

After a period of time most animals adjust to and ignore sounds through habituation. Audible sounds >130 dB and infrasonic or ultrasonic sounds >140 dB cause pain and sometimes sickness in vertebrates. Except for explosions, it's technically difficult to produce and radiate sounds >130 dB. Consequently, audible sounds at high intensities are more likely to be a nuisance for people than wildlife.

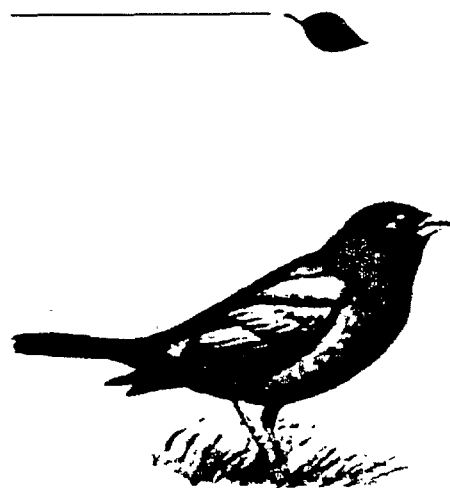
Broadcasts of recorded distress or alarm calls, referred to as "biosonic devices", have been used to drive birds from agricultural fields, orchards, and roosts. In laboratory tests on starlings, distress calls caused a greater increase in heart rate than escape calls, drug-induced calls, feeding calls, or human voices. When compared to other sounds, 3 times as many exposures to distress calls were required before starlings habituated to the stimulus. In a field test on night herons at a fish pond, sound from a recorded propane exploder initially reduced fish losses, but complete habituation by the herons occurred after 6 nights of exposure. More than 80% of the herons left the pond when distress calls were played, and no habituation was observed after 6 months. The use of biosonic sounds may well have additional field applications for wildlife damage management.

Most other sonic pest control devices rely on fear or perceived danger for their effect. Bomford and O'Brien summarized, "The conclusions that can be drawn from these laboratory and field trials are: (1) loud sounds are more aversive than quiet sounds; (2) sounds with a wide frequency range are more aversive than pure tones; (3) adult birds are more easily scared than juveniles; and (4) all species habituated to nearly all sounds tested. Consequently, the value of bangers, clangers, poppers, bombers, sirens, and most electronic noises on the birds and mammals tested is almost entirely limited to short-term control. The best

effects are obtained when (1) sound is presented at random intervals; (2) a range of different sounds are used; (3) the sound source is moved frequently; (4) sounds are supported by other methods, such as distress calls or visual devices; and (5) sounds are reinforced by real danger such as shooting."

Loud sounds, audible or ultrasonic, have been shown to kill insects and rodents under laboratory conditions by increasing their body temperature. These thermal effects would be impractical and dangerous to use under field conditions. Captive rodents exposed to high-frequency and high-intensity sound sometimes exhibit audiogenic seizures. Again this method is not feasible for field use.

Bomford and O'Brien summarized, "...that devices producing sounds other than communicative signals (alarm and distress) have no persistent effect on animals' space use or food intake." Biosonic devices show promise, but further experimentation is needed to fully assess their cost-effectiveness. Sounds are usually species-specific, and wildlife may habituate to the distress or alarm calls if they are used over long periods of time. And finally, Bomford and O'Brien concluded, "Ultrasonic devices do not meet the claims made for them."



Potential Reregistration of Mesurol? by Paul D. Curtis, Extension Associate

There is currently an effort to examine the potential for obtaining a new EPA registration for Mesurol™ as a bird repellent for fruit crops. Dr. David Otis, USDA/ADC-Denver Wildlife Research Center, is obtaining input from fruit and vegetable growers to determine the interest in moving forward with this process. Francis Dellamano, Oswego County Extension Agent, spoke with Dr. Otis to determine the status of this effort. Dr. Otis has received an outstanding response from producers supporting the reregistration of Mesurol. He is planning to organize growers and formulate a "plan of attack," but the process will likely take 2 or more years and cost more than \$2 million.

Dr. Richard Dolbeer, USDA/ADC/DWRC-Sandusky, Ohio, thought the chances of obtaining a new registration for Mesurol were very slim. He doubts that the company that produced Mesurol is willing to share the costs of additional testing and certification. At best, the process will be a slow, uphill battle. Dr. Dolbeer is currently experimenting with methyl anthranilate as an alternative chemical bird repellent, and early results are encouraging.

If you would like to have input into the decision-making process, you may send letters to: Dr. David Otis, USDA/ADC, Denver Wildlife Research Center, Denver Federal Center-Building 16, Denver, CO 80225. Dr. Otis needs to know: (1) how many acres you are cultivating and the type of crop produced, (2) what proportion of your crop is lost to birds, and (3) your evaluation of Mesurol as a bird repellent. It's very unlikely that chemical bird repellents will be available to fruit producers during the next few years, but several biorational compounds are currently being evaluated.

Guidelines for Agents Recommending "Home Remedies" for Wildlife Control by Paul D. Curtis, Extension Associate

A variety of over-the-counter products exhibit repellent properties for certain wildlife species. Cornell Cooperative Extension agents are put in a difficult position when clients request information concerning the use of chemical-based "home remedies" for wildlife control. These products are not registered as "pesticides," and their use is not regulated under the Federal Insecticide, Fungicide, and Rodenticide Act. Consequently, home remedies have no Environmental Protection Agency registration number, and have not been approved for in-state use by the NYS-Department of Environmental Conservation. However, certain home remedies can effectively repel wildlife under some circumstances, and many commercial orchardists and homeowners are currently using these products to reduce deer damage.

Anthony Parise, Associate University Counsel, has reviewed the use of home remedies as pesticides. He emphasized that the use of these products should be based on research results. Also, Parise stated that published lists of pesticide home remedies "should contain a disclaimer in large bold print that, (1) these remedies are not endorsements by Cornell University of any product or procedure, and (2) they are not recommendations for use, either expressed or implied, and that neither Cornell University, nor its employees or agents, are responsible for any injury or damage to person or property arising out of the use of this information."

This may seem like an unreasonable amount of caution for home remedies, many of which appear to be safe. However, the long-term pesticidal effects of these over-the-counter products have not been critically evaluated. Federal and state registration guidelines were established to protect both humans and the environment, and should not be ignored.

Agents should use caution when discussing applications of chemical-based home remedies for reducing wildlife damage.



New Deer Management Video Available

by Paul D. Curtis, Extension Associate

A new deer management video entitled "White-tailed Deer: Pennsylvania's Most Controversial Animal," is available from Penn State University. This tape explores the deer management controversy through interviews with farmers, hunters, forest managers, wildlife agency staff members, and other stakeholders who are directly impacted by white-tailed deer. Current management strategies are discussed, and suggestions are offered for reducing deer conflicts. Although the tape is targeted at Pennsylvania residents, much of the information is applicable to New York State. Many deer management concerns are briefly mentioned, and this tape is great for stimulating additional discussion.

The content was prepared by Margaret Brittingham, assistant professor of wildlife resources, and William Sharpe, professor of forest hydrology, School of Forest Resources, Penn State College of Agriculture. The VHS tape is 34 minutes in length. Copies can be purchased for \$35 each (including postage and handling) from: Ag Information Services, 119 Ag Administration Building, The Pennsylvania State University, University Park, PA, 16802 (Phone 814-865-6309).

Current Literature

by Michael J. Fargione, Research Support Specialist

Austin, D.D., and P.J. Umess. 1989. Evaluating production losses from mule deer depredation in apple orchards. *Wildl. Soc. Bull.* 17:161-165.

Fruit growers must estimate potential crop losses from deer damage in order to choose cost-effective control measures. However, little research information has been published concerning techniques to evaluate the effects of deer damage on apple yields. In this report, the authors examined the relationship between overwinter browsing by mule deer and the production of 'Red Delicious' apples in the first crop following damage. Data were collected from 8 mature, commercial orchards in Utah, located within traditional deer winter ranges. Damage was documented by determining the percentage of buds that were browsed, and measuring the subsequent reduction in fruit yield of trees that were either protected or unprotected by fences.

Deer foraging on fruit buds and twigs caused significant losses of apples within the browsing zone (up to 6' above ground). The percentage of buds removed during winter was directly proportional to the proportion of the apple crop lost during the subsequent fall harvest. Apple production above the browsing zone, and the size of apples harvested within the browsing zone, were unaffected by deer damage.

New York State apple producers suffer damage from white-tailed deer, not mule deer, and primarily grow apple varieties other than 'Red Delicious'. Research biologists at Cornell University are currently attempting to quantify yield losses from deer browsing in New York orchards. Until the effects of local deer damage are documented, growers may wish to use the assessment techniques described in the Utah study to decide if deer damage mitigation measures are warranted. The authors indicated that a reliable assessment of fruit loss within

Nuisance Wildlife/Wildlife Rehabilitator I n f o r m a t i o n

Living with Wildlife

by Kelly Bolton, President, New York State Wildlife Rehabilitation Council

Contrary to popular opinion, a "nuisance" wild animal is not one that has made a conscious decision to pursue a life of wanton destruction towards human property. In many cases nuisance animals are victims of human ignorance. It's plain and simple, often people don't know how to coexist with wildlife. We cannot ignore the fact that both humans and wildlife depend on the same ecosystem for survival. Our challenge, as the "intelligent" species, is to learn to coexist with wildlife for our mutual benefit.

Wildlife Rehabilitators and Nuisance Wildlife Control Licensees have a unique opportunity to teach people how to live with wildlife. Nuisance animals are sometimes annoying, unpleasant, or obnoxious, and they may even cause property damage. In most circumstances, the problems caused by wildlife do not justify the use of lethal damage control alternatives. In fact, many homeowners who call for help with nuisance wildlife problems do not want that animal killed. As a licensee, you must first respond to the wildlife problem at hand, and then educate the homeowner to reduce future conflicts. People may unknowingly create situations that either attract or entrap wildlife. Many of the recommendations for preventing animals from becoming a nuisance appear simplistic. However, most people have never thought about wildlife ecology or behavior, and many people will be receptive to your suggestions.

A variety of situations may cause nuisance wildlife problems. Uncapped chimneys provide easy entry into homes for squirrels, raccoons and

birds. Garbage cans that are stored outside become all night "eateries" for skunks, raccoons and opossums. If possible, garbage cans should be stored inside a shed or garage. If garbage cans must remain outside, do not overfill them, and be sure they have secure, tight-fitting lids. Encourage residents to walk around their homes and look for "openings" that may provide wildlife access. Openings in attics, under porches, in foundations, and under roof overhangs must be blocked or screened to deny entry for bats, squirrels or raccoons. Also, uncovered window wells make potential death traps for many small animals such as skunks. These are only a few suggestions for coexisting with wildlife.

Wildlife Rehabilitators and Nuisance wildlife Control Licensees should become familiar with all the tactics and tools for teaching people how to live with wildlife. An excellent source of information is the recently published book, "Pocket Guide to the Humane Control of Wildlife in Cities and Towns," edited by Guy R. Hodge. This publication may be ordered directly from: The Humane Society of the United States, 2100 L Street, NW, Washington, DC 20037, at \$4.00 per copy.

The lack of knowledge about wild animals exhibited by many urban residents is often a reflection of a deeper, anthropocentric attitude that threatens our air, water, and our very existence. We must take every opportunity to teach people how to live with wildlife, because animals enhance our quality of life and can provide an early warning of environmental contamination or degradation.



an apple orchard could be made if the following data were collected: (1) the percentage of buds removed within the browse zone; (2) the ratio of the number of flower clusters within the browse zone to number on the entire tree; and (3) the total production of the orchard. After estimating the percentage of fruit lost, current market prices could be used to determine a dollar value for cost-effective deer browsing prevention measures. Growers should try this method for several apple varieties, because the buds on all varieties are not equally susceptible to deer damage.



Study Models Deer-Damage Control Decisions by Orchardists
by William Siemer, Research Support Specialist, Human Dimensions Research Unit

Deer damage to fruit trees is an important issue in New York, as this state is the second largest apple producer in the country. Mitigation measures, such as deer-control assistance or information, can be designed to address orchardists' damage control needs. Yet, to be most effective, these efforts should be based on an understanding of how orchardists' make damage-control decisions, and how they are likely to respond to given information and assistance programs. To obtain this information, members of the Human Dimensions Research Unit, Department of Natural Resources, Cornell University, conducted an extensive set of interviews with orchardists in southeastern and western New York.

Analysis of the interviews indicated that damage-control choice was influenced by perceived need for control, orchard characteristics, orchardist characteristics, and perceived control traits. Information used by apple growers was limited, variable, and of low quality. Control use patterns suggested that future damage

control assistance programs would have the greatest chance of acceptance if they: (1) meet salient existing needs, (2) demonstrate clear relative advantage over alternative programs, (3) are compatible with user beliefs and values, and (4) are promoted through appropriate communication channels. Researchers concluded that the likelihood that growers will make the best control decisions may increase significantly through efforts to: (1) establish simple damage-estimation techniques, (2) establish the comparative effectiveness of available control options, and (3) communicate the value of using these tools in decision-making. Improved information in these subject areas will allow wildlife managers and Cornell Cooperative Extension agents to provide more consistent and reliable deer damage mitigation recommendations to fruit growers in the future.

Results of the study are summarized in a 14-page document titled, "A Conceptual Framework for Analysis of Deer-Damage-Control Decisions" (1990 Natural Resources Research and Extension Series Report No. 35). Copies of the report may be obtained from the: Cornell University Publication Distribution Center, 7 Business and Technology Park, Ithaca, NY, 14850 (phone: 607-255-2080).



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