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April 1995

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SURVEY OF THE NUISANCE WILDLIFE CONTROL INDUSTRY WITH NOTES ON THEIR ATTITUDES AND OPINIONS

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Abstract: A total of 138 nuisance wildlife control operators (NWCO) attending a wildlife control operators short-course were surveyed for information about their business and attitudes regarding management of urban wildlife problems. One hundred and thirty-one (94.9% response rate) returned the survey. Seventy-two percent of the respondents operated a nuisance wildlife business. Of these respondents, 47.7% also operated a full-time pest control business. Over 65% of NWCO had been in business <5 years and 89% reported their business was successful as a result of either increased nuisance animal problems, satisfied customers, a growing customer base, enjoyment of their work, or by providing a high level of service. Over 30% of NWCO had annual billings >\$100,000. Respondents based fees on either the animal species and number removed, on a contract or flat fee basis, or based on time and number of trips required to resolve the problem. A large majority of NWCO use live-trapping and releasing off-site as the preferred method of controlling wildlife pests because of customer desires or for public relations reasons. Over 95% of respondents did not believe euthanization should be required for all animal species, but a majority indicated euthanization should be required for pest birds. Fifty percent believed nuisance wildlife should not be released back into the environment because of the potential to spread disease. A small percentage felt wildlife should not be relocated for humane reasons, yet a majority felt that reduction of pain felt by an animal was very important. The majority felt NWCO should be certified or licensed and that in-service training, a trapper education course, an examination, and possession of general liability insurance should be required for operating as a NWCO. This information suggests: 1) that the NWCO industry is growing rapidly, 2) NWCO support state agency policy requiring education, licensing, and liability insurance, and 3) there are problems between NWCO actions and wildlife professionals regarding the fate of live-trapped nuisance wildlife.

Pages 104-108 in R.E. Masters and J.G. Huggins, eds. Twelfth Great Plains Wildl. Damage Control Workshop Proc., Published by Noble Foundation, Ardmore, Okla.

Key words: human dimensions, trapping, urban wildlife, wildlife damage management.

A variety of factors have allowed various entrepreneurs, wildlife biologists, fur trappers, pest control firms, entomologists, and chimney sweeps to specialize in the removal of nuisance or problem wildlife (Barnes 1994). These individuals are collectively referred to as nuisance wildlife control operators (NWCO) (Barnes 1993). Bluett (1993) and Curtis et al. (1993) reported a linear expansion (20% annual increase) of the industry since the mid-1980's in Illinois and New York. Barnes (1993), Curtis et al. (1993), and Braband and Clark (1992) observed that nuisance wildlife control is an emerging wildlife management industry. Brammer et al. (1994) and Craven (1992) observed that nuisance wildlife control is a subject of concern and there are few consistent efforts by state agencies to manage NWCO and their activities. Brammer et al. (1994) called for a state agency policy that included education, administrative oversight, sensitivity to animal and human welfare needs, and the privatization of NWCO while maintaining agency control. To formulate effective state wildlife agency policy, more information needs to be gathered about attitudes and opinions of NWCO concerning wildlife and how their businesses operate. The purpose of this study was to provide information to help policy makers, administrators, and educators guide this emerging industry. Specific objectives were to examine: 1) business attributes of NWCO, 2) their attitudes and opinions concerning the humane treatment of wildlife, and

3) education and training of NWCO.

I would like to thank Peter Bromley, James Armstrong, James Parkhurst, and Robert Schmidt for reviewing an earlier draft of this manuscript. Mike Lacki provided statistical advice. This investigation is associated with the Kentucky Agricultural Experiment Station and is published with the approval of the Director.

METHODS

All participants attending the first Eastern Nuisance Wildlife Control Operators short-course, held at Lexington, KY, were handed a 5-page, 29-question survey at the beginning of the workshop held during February 1994. The educational workshop was designed to provide NWCO with technical information on theory and application of wildlife damage techniques, on developing an integrated wildlife damage management program, precautions associated with wildlife diseases, humane treatment of captured wildlife, and basic business skills (Table 1). Attendees were given the survey and instructed to fill it out and return it unsigned, to a collection container. This was not a random survey of all NWCO; rather, it was a sample of NWCO that chose to attend the voluntary workshop.

A chi-square contingency test and test of independence (Daniel 1974) was used to compare percent time working as a NWCO and annual billings. Means are reported ± 1

standard deviation. When applicable, frequency or percentage expressions were tabulated.

RESULTS

One hundred and thirty-eight survey instruments were distributed and 131 individuals (94.9% response rate) completed and returned the survey. Conference attendees represented 32 states. Seventy-two percent of the respondents were NWCO and the remaining 28% were either state wildlife agency, public health, United States Department of Agriculture-Animal and Plant Health Inspection Service-Animal Damage Control, cooperative extension employees, or individuals representing other interests. Approximately one-half of NWCO (47.7%) also operated a pest control firm (controls insects, termites, roaches, or rodents). On a sliding scale of 1-5, with 5 the highest rating, respondents were pleased with the meeting ($\bar{x} = 3.8 \pm 0.65$) and meeting content ($\bar{x} = 3.7 \pm 0.75$).

The majority of NWCO (54.3%) had been in business <5 years and considered their businesses successful (89.9%). Reasons for a successful business included: satisfied customers (21.2%), an increase in nuisance wildlife problems (18.2%), enjoyment of their work (18.2%), a high level of service provided to customers (16.6%), a growing customer base

(16.1%) or other reasons (9.6%). NWCO spending more than 50% of their time as a NWCO had significantly higher ($X^2 = 41.97, 4 \text{ df}, P < 0.01$) annual billings than other groups (Table 2). However, the majority of NWCO (51.6%) spent <25% of their time working as a NWCO and had annual billings <\$25,000 (60.4%). NWCO set their fee structure based on the animal species and number of animals removed (45.3%), on a contract or flat fee basis (29.2%), or on the amount of time and number of trips required to resolve a problem (17%).

A series of questions were asked in an effort to identify which types of wildlife damage management techniques were being used by NWCO. All NWCO (100%) provided advice on preventing, managing, or controlling wildlife damage problems and 89% referred customers to other agencies or companies for problems they could not solve. On a sliding or Likert-type scale of 1 to 3, with 1 being the most preferred control method, the majority of respondents indicated live-trapping and releasing off-site ($\bar{x} = 1.5 \pm 0.74$) was their most preferred method for controlling wildlife pests. This was followed by live-trapping and euthanization ($\bar{x} = 1.9 \pm 0.84$), exclusion ($\bar{x} = 2.1 \pm 0.70$), lethal trapping ($\bar{x} = 2.2 \pm 0.70$), and habitat modification ($\bar{x} = 2.3 \pm 0.84$). Live-trapping and release off-site was the preferred method of managing raccoon (*Procyon lotor*), tree squirrel (*Sciurus* spp.), striped skunk (*Mephitis mephitis*), and woodchuck (*Marmota monax*) problems (Table 3). Exclusion was the preferred technique for controlling bats (Chiroptera) and lethal trapping was the preferred method for controlling moles (Talpidae) (Table 3). A variety of methods were used to control snake (*Serpentes*) problems.

While exclusion methods were not preferred, 82.3% of respondents indicated repair or exclusion of an animal's entry point was part of their job. A majority of respondents (56.7%) did guarantee their work. When asked why they preferred to release an animal after capture with a live-trap, most (52.2%) responded it was either at customer request or for public relations reasons. Other reasons for release included giving the animal another chance for survival (18.8%), state law mandated release after capture (10.1%), it was the most humane solution (5.8%), relocated animals have a low survival rate (5.8%), it was too difficult to obtain drugs to euthanize an animal (4.3%), or other reasons (2.9%).

Most (95.3%) NWCO responding did not think euthanization should be required for all nuisance wildlife after capture and 71.1% said mandatory euthanization should depend upon the species in question. Respondents indicated that euthanization should be required (value in parentheses is the percent of respondents indicating euthanization should be required) for pigeons (*Columba livia*) (56.3%), blackbirds (*Agelaius phoeniceus*), starlings (*Sturnus vulgaris*), or grackles (*Quiscalus* spp.) (51.6%), skunks (47.7%), raccoon (38.2%), opossum (*Didephis virginianus*) (26.6%), fox (*Vulpes* spp.) (14.4%), tree squirrels (12.5%), and bats (9.4%). Reasons for not releasing wildlife included a possible spread of disease (50%), translocation treats the symptom and not the cause of the problem (30.0%), public lands will become a "dumping ground" for nuisance wildlife (12.5%), or translocated animals have a high mortality rate (12.5%). NWCO were evenly dis-

Table 1. Topics presented at the first eastern nuisance wildlife control operators shortcourse.

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- Animal damage control theory and application
 - The basics of wildlife habitat selection
 - Basic population dynamics
 - Bat identification
 - Controlling problem bats
 - Identification of endangered and threatened species
 - The proper and prudent use of pesticides
 - The proper use of repellents
 - Exclusion as a part of the NWCO business
 - Habitat modification as a control option
 - Animal welfare concerns of the industry
 - An overview of mammalian diseases
 - Rabies
 - Snake identification
 - Federal guidelines for transporting wildlife
 - AVMA guidelines for proper euthanization of animals
 - Equipment for operating a successful business
 - Bait selection
 - USDA, APHIS, ADC and bird control
 - Should we be releasing live-trapped animals back into the environment?
 - Mole control
 - Reducing your liability risk
 - Avoiding public relations nightmares
 - Should there be a national certification program?
 - How to set up and run a small business
-

Table 2. Percentage of time working as a nuisance wildlife control operator and annual billings.

Annual billings (\$)	Time working as a NWCO (%)	Contribution to X^2 (%)
<\$25,000	<25	17.7*
25,000-50,000	<25	8.4
>50,000	<25	7.8
<25,000	25-50	1.8
25,000-50,000	25-50	0
>50,000	25-50	3.8
<25,000	>50	30.5*
25,000-50,000	>50	7.4
>50,000	>50	22.6*

*Indicates a significantly higher ($P \leq 0.01$) contribution to the X^2 than expected.

tributed in their viewpoints on the humane treatment of nuisance wildlife. Thirty-five percent reported humane treatment to be very important and they would charge a higher price or incur larger costs to insure humane treatment. Another 29.9% believed humane treatment was very important but would not charge a higher price or incur larger costs to ensure humane treatment. Finally, 33.3% reported humane treatment was moderately important and 1.7% indicated humane treatment was unimportant.

Most NWCO (77.2%) responding supported the idea of certification or licensing by a government agency prior to practicing as a NWCO. They also indicated NWCO should be required to pass a test or examination (69.5%) and be required to attend continuing education seminars presented by the Cooperative Extension Service or the state wildlife agency. A slight majority (51.9%) felt a trapper education course should be required; although, 87.1% of respondents had not taken a trapper education course prior to attending the meeting. Only 12.2% of the respondents felt a college or university degree in wildlife ecology should be required to practice and a majority of respondents had not taken any university level courses or inservice training in the area of wildlife management (58.5%) or wildlife damage management (57.5%). A majority of respondents (56.5%) indicated NWCO should be required to have general liability insurance. This was the first inservice training that 65.4% of respondents had received in managing nuisance wildlife problems.

DISCUSSION

The information generated from this survey indicates NWCO businesses are expanding, successful, and potentially profitable wildlife management enterprises, consistent with previous reports from Kentucky (Barnes 1993) and New York (Curtis et al. 1993). This information also shows a majority of NWCO do not work in this business on a full-time basis. However, for those individuals that were full-time NWCO, nuisance wildlife control appeared to generate significant annual billings. These data also support the idea that NWCO can be located in large or small urban communities. Barnes (1993)

observed that a community with a population of 10,000 may support at least one part-time NWCO in Kentucky and Curtis et al. (1993) hypothesized full-time commercial NWCO were associated with metropolitan areas while part-time NWCO satisfy the demand for services in more rural areas. Most NWCO appeared to enjoy their work and felt their businesses were successful as a result of that enjoyment.

Information generated from this survey support conclusions of Brammer et al. (1994) and Barnes (1993) that NWCO recognize the need for education, licensing, and liability insurance because NWCO generally have a high school diploma and have little specialized training in wildlife management. Based on results from this survey, any continuing education efforts should include components on the humane treatment of wildlife, wildlife diseases, wildlife management principles, and trapper education. Bluett (1993) recommended improvements to the Illinois nuisance wildlife program should include increased educational efforts that promote the coexistence between humans and wildlife, developing information brochures, developing policy statements on relocation, and funding an extension-type nuisance wildlife program. Technical knowledge and continuing education and testing should be required by NWCO (Brammer et al. 1994). Most NWCO welcome and support the idea of testing and certification or licensing.

Live-trapping and release off-site was the primary control method preferred by NWCO. This control method is the most widely used and popular technique (Associated Market Research 1991, Braband and Clark 1992, Barnes 1993, Curtis et al. 1993) even though use of exclusion, habitat modification, or other wildlife damage management techniques may provide more permanent solutions. The use of live-trapping and translocating wildlife appeared to be driven by the desires of the public or clientele who do not want animals killed or harmed (Braband and Clark 1992).

Just as translocations of nuisance wildlife have increased in the urban setting by NWCO, so has the concern increased among wildlife biologists and resource managers, pest control personnel, and the general public over the wis-

Table 3. Preferred management techniques (% of respondents) by animal species used by nuisance wildlife control operators (N = 95) that attended the first Eastern Nuisance Wildlife Control Operators Short-Course, February 1994, Lexington, Ky.

Animal	Preferred management techniques					
	Chemical repellent	Habitat modification	Exclusion	Live-trap removal	Lethal trap	Poison
Bat	3.6	4.8	65.1	22.9	1.2	2.4
Mole	5.9	5.9	7.3	1.5	63.2	16.2
Raccoon	0.5	3.9	16.8	74.2	4.7	0.0
Skunk	0.0	2.9	15.9	78.3	2.9	0.0
Snake	30.3	22.7	24.2	20.0	1.4	1.4
Tree squirrel	0.0	4.3	28.1	56.8	7.9	2.9
Woodchuck	0.0	5.6	16.8	57.3	18.0	2.3

dom, humaneness, and efficacy of nuisance wildlife translocation (Barnes 1993). While the respondents generally felt nuisance wildlife should be treated humanely, less than 65% noted that they would charge a higher fee or incur greater costs to insure that humane treatment. Furthermore, less than 6% of NWCO felt animals should be translocated because it is inhumane.

While the public favors translocation because it is perceived as non-lethal and NWCO use this as a primary control technique, wildlife professionals and state agency personnel need to develop policies on translocation of nuisance wildlife that address the following: 1) survival rate of translocated animals by untrained and trained NWCO into an environment that is at carrying capacity, 2) potentials for the spread of disease into healthy, free ranging populations from translocated nuisance wildlife, 3) humaneness of translocation for wildlife, 4) impact of nuisance wildlife translocations on resident wildlife, and 5) potential for continuing nuisance behavior if the animal survives. For these and other reasons, live-trapping and translocation is the least preferred method of handling captured wildlife by the Humane Society of The United States (G. Hodge, pers. commun.). Brammer et al. (1994) called for a policy that would protect wildlife from inhumane treatment, provide reasonable control options, and permit the professional development of NWCO while maintaining state wildlife agency control.

An alternative to live-trapping and release off-site is to capture animals and humanely euthanize them. This was the second most preferred method of control reported by NWCO. The issue of mandatory euthanasia is volatile and controversial among NWCO and euthanasia regulations vary tremendously by state (Craven 1992, Brammer et al. 1994). A strong majority of NWCO responding to this survey disapproved of mandatory euthanasia but did approve of euthanasia for birds. Barnes (1993) reported NWCO in Kentucky approved of lethal control for commensal rodents and birds but not for tree squirrels. The primary reason NWCO do not want to translocate wildlife is the potential spread of disease (50%) and

satisfying customers (Braband and Clark 1992). A commonly held argument or impediment against euthanasia is the difficulty of obtaining appropriate drugs. This appears unwarranted as only 4.3% of respondents in this study stated it was too difficult to obtain drugs to euthanize animals.

Data presented in this survey indicated there is room for reducing the frequency of handling and transporting nuisance wildlife through NWCO educational programs that would emphasize ways to exclude animals to reduce human-wildlife conflicts or ways to modify habitats that might elicit a change in animal behavior or movements. Because NWCO will likely continue to use live-trapping and translocation as their preferred control method, the industry needs to review all relevant research information on the ecological fate of translocated animals and if sufficient gaps in data are present, new research should be initiated to answer pertinent questions.

Human-wildlife conflicts are likely to increase in the future as a consequence of increased urbanization, increases in some furbearer populations, and reduced fur harvests associated with low pelt values (Bluett 1993). As the NWCO industry expands to meet this growing demand, state wildlife agency personnel, policy makers, and administrators can assist NWCO in becoming professionals and reducing conflicts between NWCO and wildlife professionals by initiating educational programs that foster better communication in the industry, establish new or improve existing regulations that are consistent regionally, and generate new information on the fate of translocated nuisance wildlife.

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