



Public Attitudes toward Wildlife Damage Management and Policy

Author(s): Douglas K. Reiter, Mark W. Brunson, Robert H. Schmidt

Source: *Wildlife Society Bulletin*, Vol. 27, No. 3 (Autumn, 1999), pp. 746-758

Published by: [Allen Press](#)

Stable URL: <http://www.jstor.org/stable/3784098>

Accessed: 11/08/2011 22:03

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Allen Press is collaborating with JSTOR to digitize, preserve and extend access to *Wildlife Society Bulletin*.

<http://www.jstor.org>

Public attitudes toward wildlife damage management and policy

Douglas K. Reiter, Mark W. Brunson, and Robert H. Schmidt

Abstract Wildlife damage managers consider various factors when selecting an appropriate course of action to handle problem wildlife. One of those factors is how the public views both the damage and the government's role in managing that damage. We conducted a mail survey of randomly selected American households to assess general attitudes toward wildlife and specific concerns about wildlife damage management. Respondents strongly supported the federal government's role in ensuring public safety, engaging in public education, and continuing research of non-lethal control methods. Less support existed for lethal control of predators and crop depredators, whereas financial compensation for losses from wildlife activities was generally opposed. Lethal methods of control were generally considered to be inhumane and non-lethal methods humane. When asked to rank importance of factors to be considered when selecting management methods, human safety ranked highest, followed by animal suffering, effectiveness, environmental impacts, severity of problem, and ability to target the specific problem animal. The lowest ranked factor was public opinion. Collectively, our results suggest that United States citizens want a role in wildlife damage policy formation, but respect wildlife professionals' judgement in specific management situations.

Key words Animal Damage Control, attitudes, public opinion, survey, wildlife damage management, Wildlife Services

Introduction

The wildlife management profession recognizes the importance of obtaining reliable information about the broad public's concern for wildlife policy issues. Management actions taken without this information discount the strong personal interest that millions of Americans hold toward wildlife (Conover 1997). Moreover, it can leave wildlife managers susceptible to political backlash as disaffected citizens seek redress in ballot initiatives, legislative actions, or other political mechanisms that are less responsive to the professional expertise of wildlife managers. This is especially true when the policy issue pertains to hunting, trapping, or controlling wildlife. One such issue is managing wildlife damage.

The Wildlife Services (recently renamed from Animal Damage Control) program of the United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) is charged with resolving conflicts between the public and wildlife (Animal Damage Control 1994). Important to that process is that agency personnel understand public attitudes and preferences concerning wildlife and wildlife damage management (WDM). As part of an APHIS evaluation of Wildlife Services' activities (APHIS 1993,1994), program leaders recognized that there was a need to obtain current information about public attitudes toward WDM, including opinions about who should be managing and which management methods are preferable. To obtain that information, we conducted a nationwide public survey to examine attitudes

Address for Douglas K. Reiter and Mark W. Brunson: Department of Forest Resources, Utah State University, Logan, UT 84322-5215, USA. Address for Robert H. Schmidt: Department of Fisheries and Wildlife, Utah State University, Logan, UT 84322-5210, USA.

toward wildlife damage management. This paper describes results of that survey, focusing on 1) attitudes toward wildlife damage policy, emphasizing the federal government's role, and 2) attitudes toward wildlife damage management practices and their application.

Background

The federal Wildlife Services program has responsibility in wildlife damage management, a specialization within the profession of wildlife management. The statutory authority creating the program was granted by the Animal Damage Control Act of 2 March 1931 (46 Statute 1468; 7 United States Code, 426-426b). Wildlife Services is not a resource management agency, per se, but rather is called on by other agencies and the private sector to lend operational and technical assistance to control damage caused by wildlife. Among the resources protected are: 1) field crops, 2) fruits and nuts, 3) commercial forests or forest products, 4) grazing lands and other resources, 5) aquaculture and mariculture, 6) livestock, 7) facilities and structures, and 8) public health and safety (Animal Damage Control 1994).

Much research has been done regarding human relationships and attitudes toward wildlife (e.g., Kellert 1979, Kellert 1980, Kellert and Berry 1985). Studies have focused on general attitudes toward wildlife, as in the studies by Kellert and his colleagues cited above, as well as such specific wildlife topics as gray wolf (*Canis lupus*) reintroduction (Bath 1991), invertebrates (Kellert 1987, 1993), and sandhill cranes (*Grus canadensis*, McIvor and Conover 1994). Two studies in the 1970s examined predator control (Arthur et al. 1979, Kellert 1979) but did not consider the broader issue of wildlife damage management. While Wildlife Services and its programs have been the subject of academic scrutiny (Schmidt et al. 1992a,b; Schmidt 1992), those papers focused on professional roles and ethics as seen from inside the wildlife profession rather than on the public's view of wildlife damage management.

Kellert (1979) and Arthur et al. (1979) found that most of the public disapproved of indiscriminate shooting or trapping of coyotes (*Canis latrans*) and overwhelmingly disapproved of poisoning. However, they also found that the public approved of controlling problem coyotes by using more selective measures that could identify and deal with the specific problem animal. The method that the

public preferred, capturing and relocating the problem coyote, also was considered the most humane.

Wildlife managers and scientists often argue that if they are able to effectively deliver the "facts" to the public, then public opinion will support their actions. Kellert (1979) examined the methods that the public thought were the best way of dealing with problem coyotes by comparing the "knowledgeable" with the "unknowledgeable" public. What he concluded was that "emotional (i.e., affective) factors were far more critically related to a protectionist attitude toward coyotes than knowledge (i.e., cognitive) factors" (Kellert 1979:58).

There are 3 shortcomings to the research on public opinion toward wildlife damage management. The first one has to do with time. In the 15 years since the work of Kellert (1980), public attitudes may have changed. An area that has changed during the past 15 years involves available control methods. Much research (e.g., Stickley and Andrews 1989, May et al. 1991, Andelt 1992) has been conducted in that time by the USDA and various universities on more humane and environmentally compatible methods of wildlife damage control (e.g., using dogs as guard animals in sheep flocks to mitigate predation by coyotes).

The second shortcoming is the research foci on specific interest groups, species, or methods. Some research focused primarily on direct wildlife damage losses to farming operations (Wywiałowski 1994). Other research concerned single-species damage (McIvor and Conover 1994) or single-species control methods (Stubby et al. 1979). The only broadly focused study was made by Conover et al. (1995), who pooled all available resources to summarize relative magnitude of national losses (economic and human injuries) attributable to wildlife.

The third shortcoming concerns the inherent limitations of the previous studies. Kellert (1979) looked at wildlife damage only as a sidebar to other issues, such as endangered species, children's attitudes, and habitat preservation. The survey length (it was a phone survey requiring an average of 60 minutes to complete) limited the number of questions specific to issues regarding wildlife damage. Other studies recently conducted by APHIS (1994) limited the study population to their direct customers, such as farmers, ranchers, and other direct beneficiaries of Wildlife Services activities, but did not assess the preference of their broader constituency, the American public.

Survey methodology

To assess public attitudes toward wildlife damage management practices, we developed and implemented a mail survey in January 1995. The survey instrument was designed by Utah State University (USU) social scientists experienced with natural resource issues in cooperation with APHIS Evaluation Services. The instrument was pre-tested in a college undergraduate social survey methodology class to examine question clarity, completion time, subject salience, and general question flow (Dillman 1978). Few modifications were needed for the final questionnaire. The final survey instrument consisted of 10 pages containing about 80 questions.

People living in different regions of the country could be expected to have differing attitudes toward wildlife and wildlife damage management (Kellert 1979; Fleishman-Hillard Research, Attitudes of the uncommitted public toward wildlife management, unpublished report, St. Louis, Missouri, 1994); therefore, we used a stratified sampling approach. We identified 5 regions based on Wildlife Services' organizational structure and previous findings about regional differences in environmental attitudes (Brunson and Steel 1996). We drew a sample population size of 300 for each of the 5 regions: 1) Pacific Coast states (Alas., Calif., Haw., Oreg., and Wash.); 2) Interior West states (Ariz., Colo., Id., Kans., Mont., Nebr., Nev., N.M., N.D., S.D., Ut., and Wyo.); 3) Texas and Oklahoma; 4) Southeastern states (Ala., Ark., Fla., Ga., Ky., La., Miss., N.C., S.C., Tenn., and Va.); and 5) Northeastern states (Conn., Del., D.C., Ill., Ind., Ia., Me., Md., Mass., Mich., Minn., Mo., N.H., N.J., N.Y., Oh., Pa., R.I., Vt., W.Va., and Wis.).

The initial mailing was followed up by a reminder postcard to all survey recipients and another survey instrument sent to those who failed to respond to the first one, following guidelines recommended by Dillman (1978). We analyzed data obtained using SPSS statistical software (Norusis 1990).

To obtain results reflective of the entire population of the United States, we randomly selected a sample of 1,500 respondents to receive the survey. We obtained names and addresses from a survey research firm (Survey Sampling, Inc., Fairfield, Conn.) which supplies names drawn from public telephone directories. Thus, we limited the study population to households with telephones, but otherwise reflected the entire spectrum of United

States residents. A problem with unsolicited mail surveys concerns random selection of an individual within the selected household to complete the survey to avoid gender or age bias. Street addresses and telephone numbers of married couples are traditionally directory listed in the husband's name as head of the household. The actual composition of household members is unknown to the researcher, and the head of the household (i.e., addressee) is likely to complete the questionnaire (Dillman 1978:169-170). In an attempt to eliminate possible gender bias, we requested that an adult (≥ 18 years of age) in the household with a birth date closest to 1 January complete the questionnaire.

It is important to understand how respondents feel toward animal damage issues as well as whether those responses are representative of the entire population being surveyed (Stinchcombe et al. 1981, Brennan and Hoek 1992, Groves et al. 1992). To examine "non-response bias," we randomly selected 10% of non-respondents from each region ($n=67$) to participate in a follow-up telephone survey. Because the length of the mail questionnaire made asking all the questions over the phone time prohibitive and possibly confusing or boring to the participants, we selected 28 of the mail survey questions for the telephone survey instrument. Specific questions used were selected based on the funding agency's informational needs. They focused on attitudes toward wildlife damage management and included several demographic variables. Non-respondents (telephone follow-up) differed from respondents (original mail survey) in that they were more likely to be female ($\chi^2=14.0$, 1 df, $P<0.001$) and tended to have lower levels of formal education ($\chi^2=10.8$, 5 df, $P=0.05$). However, with few exceptions (discussed in the text below) they did not differ in attitudes toward wildlife damage management and policy.

Results and discussion

Profile of respondents

Of the 1,500 questionnaires mailed, 600 usable surveys were returned and 225 were undeliverable or returned without being completed, an overall 47.1% return rate. These response rates provided a margin of error of $\pm 4.0\%$ at the 95% confidence interval (Sheskin 1985:31-37). The regional return rates (300 questionnaires mailed/region) ranged from the Southeast at 39.5% to the Interior West at 56.8%. Response rates of approximately 50% can

be considered typical for a multiple-page mail survey of the general population when no prior agreement to participate has been sought (Goyder 1985, Dolsen and Machlis 1991, Neuman 1994).

Average age of respondents was 51.5 years, with a range of 19 to 93 years. The respondents tended to be better educated than the average for the nation as a whole (United States Bureau of the Census 1992): 7% did not complete high school, 20% completed high school, 28% had some college, 18% completed college, 10% had some graduate school, and 17% had completed graduate work.

The high average age also was reflected in the finding that more than 25% of the respondents were retired. This may have implications in the field of social survey research in that populations with more leisure time may be willing to use that time to complete and return questionnaires.

The instructions on the survey instrument asked respondents to have the adult in the household whose birthday was earliest in the year complete the questionnaire. These instructions were given in the hope that response rate among men and women would be approximately equal. Despite this, 68% were male and 32% female. This may be a result of household phone listings (from which our sample was obtained) frequently being listed only in the husband's name. This also could be explained if males were more interested in the subject of wildlife management than females. However, on our non-response follow-up phone survey, 55% of the people we spoke to were female.

We asked respondents to mark a description of both their current and their childhood place of residence. Their responses were (childhood place of residence in parentheses): rural farm 9% (25%), rural non-farm 12% (5%), small town under 10,000 people 20% (25%), city up to 200,000 people 23% (19%), large metropolitan area with more than 200,000 people 15% (13%), and suburb of a city or metropolitan area 22% (10%).

Thus, although our respondents tended to be urban residents, nearly 60% grew up in rural areas or small towns. This could indicate that people with an interest in wildlife management issues may have had more contact with wild and domesticated animals in their formative years. The respondents tended to agree with the statement that wildlife management in general was acceptable (reflected scale). We did not find statistically significant differences between childhood place of residence ($\chi^2=0.5$, 3 df, $P=0.91$) or current place of residence

($\chi^2=6.8$, 3 df, $P=0.78$) and acceptability of wildlife management (reflected scale). Respondents also tended to agree that predator control was acceptable. People reared in rural or small town settings more strongly agreed with the practice of predator control than those reared in a more urban environment ($\chi^2=9.1$, 3 df, $P=0.03$). Stronger differences were shown ($\chi^2=11.5$, 3 df, $P<0.01$) between current type of residential setting and predator control, with the more rural type showing stronger level of agreement. McIvor and Conover (1994) suggested that people with more "direct interactions" on a more frequent basis (farmers, people in more rural settings) may be more cognizant of wildlife damage impacts that could influence their opinions.

When asked what sector of the economy respondents worked in, 35% checked private business. Other responses were retired, 25%; self-employed, 21%; government, 9%; non-profit, 6%; and not employed, 4%. When asked whether they earned income from enterprises that may be affected by wildlife damage, 16% said that they earned income through farming of fruit, vegetable, or grain crops and 15% through raising livestock or poultry. Other responses were air transportation (3%), leasing land for hunting (2%), aquaculture or mariculture (>1%), and raising fur-bearing animals (>1%).

Several questions on the survey sought to determine respondent's personal knowledge of damage caused by wildlife. Nearly a quarter of our respondents (24%) indicated that they had personally experienced damage within the last 5 years. Regionally, 31% respondents in the Interior West, 26% in the Pacific Coast, 20% in the Northeast, 19% in the Southeast, and 18% in Texas and Oklahoma said that they had experienced wildlife damage. Although it was not specifically asked what the damage was, the range of possibilities was endless, ranging from rodents in the lawn or woodpecker damage on home siding to coyote predation on sheep flocks.

We asked other questions about people's broader interest in wildlife. Most respondents enjoyed being outdoors and watching wildlife (91%), would like to conserve wildlife for future generations (90%), and felt that greater protection should be given to wildlife habitat (73%). A slight majority of people said that they did not enjoy hunting (51%).

We used a commonly employed environmental attitude scale (Catton and Dunlap 1980, Olsen et al. 1992) to assess respondents' general attitudes

Table 1: Role of federal agencies in wildlife damage management activities as determined from a 1995 survey of 600 United States households.

Statement	Response (%)					Average score ^a
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Federal agencies should be involved in animal damage research:	9	8	18	34	30	3.7
Federal agencies should be giving technical advice to landowners:	10	7	19	35	29	3.7
Federal agencies should maintain a wide range of activities:	16	11	23	28	21	3.3
Federal agencies should be involved in wildlife damage compensation:	31	19	24	15	12	2.6
Agencies should not be involved in wildlife damage management at all:	36	20	24	8	11	2.4

^a Mean response on a scale of agreement/disagreement where 1=strongly disagree, 3=neutral, and 5=strongly agree.

toward the environment (see also Dunlap et al., Measuring endorsement of an ecological worldview: a revised NEP scale, Washington State University, unpublished manuscript, 1992). Responses were tilted toward the preservation or conservation side of the spectrum (coefficient alpha=0.82). This is not necessarily an indication of survey bias, as most Americans tend to see themselves as environmentalists (Brunson and Steel 1994). Responses to the Catton and Dunlap (1980) scale were similar to those found in other national surveys on natural resource issues (e.g., Brunson and Steel 1994, 1996). It should be noted that the people who responded to the survey appear to have a strong interest in managing wildlife or issues about wildlife damage management. This is borne out by the numerous responses written on the back of the survey forms. The range of subjects was vast, from personal stories about wildlife to criticism of the questionnaire and political opinions, and also included respondent's childhood exposure to different wildlife education media sources.

Attitudes toward wildlife damage policy

Although most of our policy questions focused on the federal government's role in controlling wildlife damage, we first wanted to know which entities respondents felt should have that responsibility. When given a list of possible responsible entities, respondents selected state governments most often (73%), followed by the federal government (56%), city or county government (50%), the party who suffered the damage (33%), and private business (21%). Five percent thought that no action

should be taken. Nearly three-quarters of the respondents checked more than 1 response, suggesting either that Americans are unsure who is best equipped to handle wildlife damage management or that they recognize that different entities can effectively contribute in different ways.

Perhaps one reason for the wide range of responses about who should control wildlife damage is that relatively few people know who does have that responsibility. Only 19% of respondents answered yes to the question "Have you ever heard of the United States Department of Agriculture's Animal Damage Control (ADC) program?" Western respondents were most likely to have heard of ADC (now named Wildlife Services, 24%), whereas Texans and Oklahomans were least likely to answer yes (15%). These results suggest an opportunity for Wildlife Services and APHIS to begin to foster the public partnership relationship through educational efforts and by actively seeking public participation in policy decisions.

Wildlife damage management efforts can take numerous forms. Therefore, we asked respondents whether they agreed or disagreed with 5 statements about different forms of wildlife damage management as performed by the federal government. Responses were made along a scale where 1 indicated strongly disagree, 5 indicated strongly agree, and 3 indicated neutral (Table 1). Three of the statements—"federal agencies should be involved in wildlife damage research," "federal agencies should be giving technical advice to landowners," and "federal agencies should maintain a wide range of activities"—had positive scores (averaging

Table 2: Average scores of respondents concerning importance of federal government agencies' participation in wildlife damage management activities as determined from a 1995 survey of 600 United States households.^a

Statement	Average score
Control bird flocks near airports causing air crashes	4.2
Promote public education about wildlife	4.1
Help people learn to live with wildlife	4.0
Research non-lethal wildlife control methods	3.8
Include public participation in wildlife management activities	3.8
Remove animals that threaten humans	3.7
Use of live traps to relocate animals	3.7
Control rodents that damage agricultural crops	3.6
Discourage human handling of wildlife	3.5
Curtail bird flocks that can damage power plants	3.4
Remove beaver dams flooding roads or property	3.2
Remove animals preying on endangered species	3.2
Control predators that threaten livestock	3.1
Fence out wildlife	3.0
Control deer, elk, & wildlife that damage winter hay storage	2.9
Participate in activities that kill problem wildlife	2.9

^a Coefficient alpha for the 16 items=0.93

greater than 3). Respondents tended to disagree with the statements "federal agencies should be involved in wildlife damage compensation" and "agencies should not be involved in wildlife damage management at all."

Wildlife Services currently conducts a wide range of animal damage management activities, including research, consultation, trapping and hunting, compensation, and public relations (Animal Damage Control 1994). The survey shows that there is moderate public support for such a broad federal approach to wildlife damage management. Only about 20% believe the federal government should not be involved in wildlife damage management. However, some respondents would like to restrict activities to research and advice.

We explored the issue of financial compensation further in a series of questions. Twelve percent thought that companies should receive financial compensation for wildlife damage (56% replied "no" and 32% "don't know"), whereas 21% thought private individuals should receive financial compensation (54% replied "no" and 25% "don't know"). This finding echoes those of Kellert (1979) and McIvor and Conover (1994), who did not find much support among the general public for compensating people or businesses that suffer wildlife damage losses.

These financial compensation questions were the

only ones reflecting evidence of non-response bias. Almost 27% of the telephone survey respondents thought that companies should receive financial compensation, and 49% thought private individuals should receive it. However, in both cases, there was no overwhelming support for compensation programs. This is curious because many western states have compensation programs in place, especially for deer-related agricultural damage.

When asked in the mail survey which entity or entities should be responsible for compensating victims of wildlife damage, 34% said compensation should not be

made at all. Private insurance was the compensating party mentioned most often (41%), followed by state government (24%), federal government (21%), conservation-environmental groups (18%), and industry-operated funds (12%). It should be noted that private insurance programs for wildlife damage compensation do not exist aside from vegetative or structural damage covered under traditional loss claims.

Another series of statements allowed respondents to rate importance of federal involvement in the broad range of activities that now fall within the Wildlife Services purview (Table 2). Activities were rated on a scale of 1-5, with 1 being not important, 3 neutral, and 5 extremely important. The activity rated highest was "controlling bird flocks near airports that can cause air crashes." Also highly rated were activities associated with public education and research on non-lethal control. The least important activities, "controlling deer, elk, and other wildlife that damage winter hay storage" and "participation in activities that kill problem wildlife" had importance ratings of 2.9, not significantly different from a neutral rating.

Decker and Purdy (1988) identified constraining factors (e.g., disease transmission, aesthetic values, economic loss, etc.) that would help wildlife managers identify constituents' wildlife acceptance capacity (WAC) threshold. Although our research

design did not specifically seek to establish that threshold among the general public, we did find general support for activities wildlife managers use that would address values humans place on wildlife.

Clearly, the American public is concerned about public safety being compromised by wildlife, with the federal government having a role in ensuring their safety. Other federal roles respondents would accept are promoting education about wildlife, furthering an understanding of human-wildlife relationships while still discouraging human handling, and actively engaging the public in management activities. Respondents also were inclined to accept federal agencies' participation in non-lethal control activities such as research and using live-traps to relocate problem animals. We did not find much support for either lethal controls or expensive physical barriers (e.g., fencing out wildlife). This does not necessarily imply that respondents believe those lethal or physical barriers measures are ineffective under certain circumstances, but rather that federal agencies should not be the prime players. Another aspect raised had to do with property damaged by wildlife and the nature of the damage. Respondents tended to think that damage caused by more attractive fauna (e.g., deer [*Odocoileus* spp.], beavers [*Castor canadensis*]) should not be dealt with by federal agencies but that small rodents (e.g., mice [*Mus* spp.] and rats [*Rattus* spp.]) should be handled by those agencies.

A related question asked where federal agencies should engage in wildlife management activities. Nearly half (48%) said both private and public lands, 35% said only public lands, 1% said only private lands, 8% said neither private nor public lands, and 8% had no opinion. Thus, an overwhelming majority (83%) thought it appropriate for federal agencies to manage wildlife on public lands. However, an important distinction can be made that of those who indicated that wildlife management on public lands is appropriate, nearly 43% thought that those activities should be restricted to public lands, whereas the remainder (57%) thought it appropriate that management occur within (and across) both public and private land boundaries. A minority (almost 8%) indicated federal agencies should not be managing wildlife on either public or private lands. It is possible that those respondents would be amenable to the idea that local or state governments or even private companies (either sin-

gularly or in collaboration) should engage in those activities. However, that minority may believe federal activities should be restricted to research and education or that federal agencies should not be involved in wildlife damage management.

Finally, we wanted to know about public attitudes toward formulation of wildlife damage policy. To assess the role different stakeholders should have in determining wildlife damage policy, respondents were given a list of organizations and asked to rate how much influence each one should have (1=no influence, 5=strong influence). The list included private sectors (ranching and farming operations), state agencies (wildlife and agricultural agencies), federal agencies (United States Forest Service, Bureau of Land Management, United States Fish and Wildlife Service, and Animal Damage Control), non-government organizations (environmental, animal rights, hunter-sportsmen groups), and other groups (university scientists, general public, the media). The highest rated organizations were natural resource management agencies such as state wildlife agencies, United States Fish and Wildlife Service, United States Forest Service, and state agricultural agencies (Table 3). Both the

Table 3: Average scores of respondents concerning how much influence should different organizations have on wildlife damage management policy as determined from a 1995 survey of 600 United States households.

Organization	Average Score	Standard Error
State wildlife agencies	4.0	4.4
United States Fish and Wildlife Service	3.9	4.6
United States Forest Service	3.8	4.8
State agricultural agencies	3.7	4.9
Airports	3.6	5.1
United States Bureau of Land Management	3.4	4.9
The general public	3.4	5.1
Ranching operations	3.3	4.9
Farming operations	3.3	4.9
Departments of health	3.3	5.4
Environmental groups	3.2	5.4
University scientists	3.1	5.6
Aquaculture operations	3.1	5.2
Private homeowners	3.0	4.9
Hunter-sportsmen groups	3.0	5.7
ADC employees	2.9	5.3
Animal rights-welfare groups	2.9	5.9
United States Congress	2.8	5.7
Departments of transportation	2.7	5.2
The media	2.2	5.4

Bureau of Land Management and the general public had mean scores of 3.4. By far the lowest rated institution was the media (2.2). Departments of transportation, United States Congress, ADC (now named Wildlife Services) employees, and animal rights-welfare groups had average scores of 2.9 or less, essentially neutral.

These results suggest that state and federal agencies are perceived by the public as the experts on wildlife. They also may mean that respondents feel that agency experts, no matter what entity signs their paychecks, work for the public and therefore should solve problems and influence policy in tandem rather than in a vacuum. Not to be excluded in that process are those entities and institutions directly or indirectly affected by those policies, such as airport managers, farmers, ranchers, and the public at large. Wildlife Services employees scored low (amount of influence on wildlife damage policy), perhaps because of the public's lack of awareness of the expertise Wildlife Services has to offer. This may be due to public ignorance or perhaps a prejudice founded on past (either real or imagined) activities (Feldman 1996).

Attitudes about managing wildlife damage

The other primary aim of our study was to better understand how the public feels about the means agencies use to control wildlife damage. This was a particularly important topic because critics of Wildlife Services (e.g., Schueler 1993, Abbey et al. 1994, Petersen 1994) generally focus on specific

practices, such as trapping or poisoning, as much as or more than they do on more general issues of whether federal agencies should be engaged in wildlife damage management activities.

Each individual holds different beliefs concerning the acceptability of various aspects of wildlife damage management. Statements were given describing some of those aspects, and respondents were asked their degree of agreement with those statements (1=strongly disagree, 5=strongly agree, 3=neutral). Respondents tended to disagree with the statements "the careful use of poisons is an acceptable method to control wildlife populations," "wildlife populations should not be managed by humans," "predator control is unacceptable," and "it is unacceptable to remove native predators that prey on threatened and endangered species" (Table 4). The 3 statements with the highest level of agreement were "it is acceptable to remove predators that prey on livestock," "farmers have the right to control wildlife that are damaging their crops," and "it is acceptable to use small- and big-game hunting as a tool to control wildlife that do crop damage," with at least 60% of the respondents in support. The 2 other statements—"predators are a risk that comes with the business of livestock production" and "wildlife control is acceptable if there is evidence that wildlife damage is the cause of economic loss"—also tended to draw agreement by respondents.

There appears to be general agreement that pest and predator control is acceptable and possibly a

Table 4: Acceptability of various wildlife damage management aspects as determined from a 1995 survey of 600 United States households.

Statement	Response (%)					Average score
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
It is acceptable to remove predators that prey on livestock:	7	9	23	30	30	3.7
Farmers have the right to control wildlife that are damaging their crops:	8	10	20	34	28	3.6
It is acceptable to use small and big game hunting as a tool to control wildlife that do crop damage:	11	8	20	31	30	3.6
Predators are a risk that comes with the business of livestock production:	6	11	27	34	21	3.5
Wildlife control is acceptable if there is evidence that wildlife damage is the cause of economic loss:	6	14	28	34	19	3.5
It is unacceptable to remove native predators that prey on threatened and endangered species:	17	20	33	17	14	2.9
Predator control is unacceptable:	29	27	28	9	8	2.4
Wildlife populations should not be managed by humans:	30	30	22	9	9	2.4
The careful use of poisons is an acceptable method to control wildlife populations:	44	19	19	10	8	2.2

Table 5: Average scores of respondents concerning importance of different factors to be considered when selecting wildlife damage management methods as determined from a 1995 of 600 United States households.

Factor	Average score	Standard Error
Human safety	4.4	3.6
Animal suffering	4.3	3.8
Effectiveness	4.3	3.7
Environmental impacts	4.1	4.0
Severity of wildlife damage problem	4.1	3.9
Ability to target specific animals	4.1	4.1
Cost	3.7	4.3
Public opinion	2.8	5.2

right held by agricultural producers. This finding contrasts with assertions made by organizations like Animal Damage Review (Wolff 1995), which suggest that most Americans oppose the work of Wildlife Services. Where the public may disagree with Wildlife Services practices most clearly is in the use of poisons (Table 4).

In previous research on preference of management methods (Kellert 1979, Stuby et al. 1979, McIvor and Conover 1994), the public generally

showed preference for non-lethal methods or for methods that can identify and selectively control the particular animal responsible for the damage. When asked about specific situations where direct intervention (both lethal and non-lethal) may be used to mitigate damage, our respondents generally agreed that those measures are acceptable. The largest degree of disagreement regarded using poisons as an acceptable way to control wildlife populations (63% disagreed, 18% agreed, 19% neutral). This reinforces a theme that runs throughout the results—that when the word “poison” is used with controlling wildlife, the practice is viewed negatively (the above question was even qualified by stating “The careful use of poisons ...”).

Different factors may be considered by professionals when selecting wildlife damage management methods. Respondents were asked to rank the importance of 8 such factors in selecting methods (1=not important, 5=extremely important; Table 5). Human safety ranked highest, followed by animal suffering, effectiveness, environmental impacts, severity of wildlife damage problem, ability to target specific animals, and cost. The only factor with an average score toward the “not important” side of the spectrum was public opinion.

Table 6: Humaneness of various wildlife damage management methods as determined from a 1995 survey of 600 United States households.

Method	Response (%)					Average score ^a
	Not humane		Neutral		Very humane	
<i>NON-LETHAL</i>						
Adjusting planting or grazing schedules	2	2	12	24	60	4.4
Human guard–livestock herders	3	4	17	28	49	4.2
Fencing out wildlife	5	6	16	27	46	4.0
Scare devices	7	4	14	29	46	4.0
Fertility control	5	8	16	24	47	4.0
Guard dogs–animals	8	7	28	24	33	3.7
Chemical repellents (non-lethal)	12	7	19	27	35	3.7
Live traps	15	5	14	27	38	3.7
<i>LETHAL</i>						
Poisoned baits for rodents	23	12	22	21	22	3.1
Calling and shooting	36	12	17	15	19	2.7
Poisons for predators	41	19	19	11	9	2.3
Fumigation or gassing dens	50	18	14	8	10	2.1
Poisoned baits for birds	55	17	15	5	7	1.9
Foot snares	55	18	16	6	5	1.9
Shooting animals from aircraft	58	15	12	7	7	1.9
Neck snares	62	18	11	4	5	1.7
Leghold traps	63	17	11	5	5	1.7

a Mean response on a scale where 1=not humane, 3=neutral, and 5=very humane.



Coyote meets lamb, California, 1974. Photo by Guy Connolly.

Wildlife Services incorporates these factors when considering selection of wildlife damage management options (Animal Damage Control 1994). The fact that respondents ranked public opinion well below the 7 other factors (36% not important, 28% important, 36% neutral) suggests that even though the respondents think that the public should be informed of management activities and play a role in policy formation, the decision to select the most effective damage control method should be made by professionals.

Because animal suffering was rated the second most important among factors that should guide choices of wildlife damage management techniques, it is important for wildlife managers to understand what respondents mean by "suffering." Table 6 shows mean ratings of different practices on a 5-point humaneness scale, along with frequency distribution of responses. Non-lethal methods consistently scored higher (more humane) than lethal methods, except for rodent poisons with an average score of 3.1, right around neutral.

Respondents seem to identify what they perceive as non-lethal (or non-injurious) with humaneness (with the exception of poison baits for rodents). Some of the non-lethal methods were passive (adjusting planting or grazing schedules), protectionistic (human or animal guards), mechanical (fences, scare devices, live traps), and chemical (fertility control, non-lethal chemical repellents). As indicated above, the public will probably accept lethal methods when the circumstances necessitate their use. However, the public's belief about a method's humaneness may not coincide with the professional's belief. Although respondents do not feel that public opinion should be a key factor in selection of wildlife damage management methods,

they do believe that animal suffering should be considered. Therefore, the public's perception of humaneness should be factored into management decisions. There were few regional differences in responses to the attitude statements. However, respondents from the 2 Eastern regions also tended to rate all wildlife damage management techniques as less humane, regardless of whether they were lethal or non-lethal. Recognition of differing attitudes given the issue, species, sociodemographic characteristics, perception of management agency, etc., should help agencies tailor policy and methods to more closely fit specific situations.

Conclusions and recommendations

This survey offers the first comprehensive look at the views that typical Americans hold concerning the damage caused by wildlife and the government's role in managing that damage. We heard from 600 randomly selected persons from across the United States. Less than 25% of our respondents felt that they had suffered wildlife damage, and even fewer had heard of the federal Wildlife Services program which manages and mitigates such damage. Nonetheless, we found a fairly high level of public interest in the topic of wildlife damage, as evidenced by a response rate of nearly 50% to a lengthy, unsolicited mail survey, and by the amount of additional comments written on the surveys.

In general, we found that most respondents believe that society has a need and a right to control the damage caused by wildlife, and that state and federal governments should play a role in meeting that need. When asked how that role should best be exercised, our respondents gave answers that reflect a general public unease about govern-



Crows congregate in a roost tree. Photo by Jack K. Clark.

ment intervention and private property rights in the 1990s. Respondents were more likely to feel that states rather than the federal government should take the lead in controlling animal damage, but they also tended to advocate public-private cooperation. In this way, the Wildlife Services program may offer a model for other federal agencies to follow due to its unique structure as a partnership between the USDA and state or private entities.

Despite this history of cooperative effort, Schmidt et al. (1992a) noted that Wildlife Services employees may harbor feelings of mistrust or alienation, not only from the general public but also from their counterparts in other agencies. Yet two-thirds of our respondents indicated that a combination of government agencies, along with either the private business sector or the injured party, should share responsibility in managing wildlife damage. Fostering a partnership relationship with other natural resource professionals and lay parties, although preferred by the public, may be the hardest adjustment wildlife professionals can make. It can place cumbersome and time-consuming constraints on the path toward developing effective policy. However, ignoring interested parties' concerns in that process may foster feelings of mistrust or even incompetence. This would be unfortunate because the public appears to place a great deal of trust in natural resource agencies' role in policy development and implementation.

We also found evidence of a widespread sentiment that the federal role in wildlife damage management should be limited—e.g., they did not support much federal involvement in compensation for wildlife damage (currently there is none), and nearly half (43%) felt there should be no federal management of wildlife on private lands. The federal roles that were most strongly supported were as researchers and as advisors-educators.

Surely the most contentious question surrounding wildlife damage policy is whether the federal government should be involved in the business of killing animals that cause damage to humans or their property. The answer from our survey seems to be a qualified "yes." We found strong support for management that protects public safety (e.g., protecting against bird-aircraft strike hazards), and a somewhat weaker but still positive support for protecting agricultural resources through lethal means. Americans do see a need to control pests and predators that threaten crops and livestock, and we



Although few people are directly exposed to wildlife predation on livestock, like this predator-killed lamb, our survey respondents demonstrated relatively positive attitudes toward predation management for livestock protection. Photo by Robert H. Schmidt.

found no evidence that they actively oppose federal involvement in vertebrate pest or predator control. However, they tend to be less likely to feel the federal government should take the lead in doing so. Instead, they'd like to see control through other means, such as hunting (where applicable) or direct action by landowners with the technical support of Wildlife Services.

Further evidence of the support for public-private cooperation was found in the responses to questions about influence on government wildlife damage policy. The entities said to deserve the greatest influence were government wildlife and land management agencies, followed by directly affected entities such as airport managers, agricultural producers, and the general public. Yet, while they told us that the public should be involved in policy, they were ready to trust the experts when it comes to on-the-ground management decisions. Public opinion was said to deserve low consideration when choosing a management technique. Instead, respondents seemed willing to accept whichever method poses little risk to humans, causes little suffering to animals, and is effective in reducing damage.

This is not to say, however, that the public has no opinions on specific control measures. When asked to rate the humaneness of control techniques, nearly all lethal methods were rated as inhumane, whereas all non-lethal methods were rated as humane. This should not be taken to mean that the public opposes using lethal methods in specific cases, but that they'd prefer non-lethal methods to

be used wherever feasible. The humaneness ratings also indicate the types of practices that are most likely to draw public opposition. In general, methods Wildlife Services used most often in cases of predator control (trapping, snares, poisons, and aerial shooting) were methods rated as least humane, which may help explain why predator control tends to draw more virulent opposition than other Wildlife Services activities.

Overall, we feel wildlife management agencies should see the results of this nationwide survey as evidence that there is indeed public support for the various activities, especially those activities other than the direct control of vertebrate pests and predators. Moreover, the cooperative aspects of Wildlife Services operations match the philosophical orientation of the American public. Agency policy may want to focus on those cooperative aspects, reinforcing working relationships with other state and federal agencies, and increasing public information efforts that draw attention to Wildlife Services' partnerships as well as to activities (e.g., research and technical advice) that may be less well-known to the public than predator control.

Acknowledgments. Funding for this research was provided by USDA-APHIS Evaluation Service (Agreement No. 94-7100-0028-GR). Also, special thanks to B. Acord for his input and Amber Denton, who assisted with data collection.

Literature cited

- ABBEY, C., M. B. GIERLACH, AND N. ZIERENBERG. 1994. Waste, fraud, and abuse in the United States Animal Damage Control program. Slippery Trout Graphics and Cloud Bridge, Tucson, Arizona.
- ANDELT, W. F. 1992. Effectiveness of livestock guarding dogs for reducing predation on domestic sheep. *Wildlife Society Bulletin* 20:55-62.
- ANIMAL DAMAGE CONTROL. 1994. Final environmental impact statement. United States Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control Program, Washington, D.C.
- ANIMAL AND PLANT HEALTH INSPECTION SERVICE. 1993. Summary of the interim update on the evaluation of Animal Damage Control (ADC): futuring update. United States Department of Agriculture, Animal and Plant Health Inspection Service, Evaluation Services, Policy and Program Development, Washington, D.C.
- ANIMAL AND PLANT HEALTH INSPECTION SERVICE. 1994. Summary of the client satisfaction survey of Animal Damage Control (ADC). United States Department of Agriculture, Animal and Plant Health Inspection Service, Evaluation Services, Policy and Program Development, Washington, D.C.
- ARTHUR, L. M., R. L. GUM, E. H. CARPENTER, AND W. W. SHAW. 1979. Predator control: the public viewpoint. *Transactions of the North American Wildlife and Natural Resources Conference* 42:131-145.
- BATH, A. I. 1991. Public attitudes in Wyoming, Montana, and Idaho toward wolf restoration in Yellowstone National Park. *Transactions of the North American Wildlife and Natural Resources Conference* 56:91-95.
- BRENNAN, M., AND J. HOEK. 1992. The behavior of respondents, non-respondents, and refusers across mail surveys. *Public Opinion Quarterly* 56:530-535.
- BRUNSON, M. W., AND B. S. STEEL. 1994. National public attitudes toward federal rangeland management. *Rangelands* 16:77-81.
- BRUNSON, M. W., AND B. S. STEEL. 1996. Sources of variation in attitudes and beliefs about federal rangeland management. *Journal of Range Management* 49:69-75.
- CATTON, W. R., AND R. E. DUNLAP. 1980. A new ecological paradigm for post-exuberant sociology. *American Behavioral Science* 24:15-47.
- CONOVER, M. R. 1997. Wildlife management by metropolitan residents in the United States: practices, perceptions, costs, and values. *Wildlife Society Bulletin* 25:306-311.
- CONOVER, M. R., W. C. PITT, K. K. KESSLER, T. J. DUBOW, AND W. A. SANBORN. 1995. Review of human injuries, illnesses, and economic losses caused by wildlife in the United States. *Wildlife Society Bulletin* 23:407-414.
- DECKER, D. J., AND K. G. PURDY. 1988. Toward a concept of wildlife acceptance capacity in wildlife management. *Wildlife Society Bulletin* 16:53-57.
- DILLMAN, D. A. 1978. Mail and telephone surveys: the total design method. John Wiley & Sons, New York, New York.
- DOLSEN, D. E., AND G. E. MACHLIS. 1991. Response rates and mail recreation survey results: how much is enough? *Journal of Leisure Research* 23:272-277.
- FELDMAN, J. W. 1996. The politics of predator control 1964-1985. Thesis, Utah State University, Logan.
- GOYDER, J. 1985. Nonresponse effects on relationships between variables. *Public Opinion Quarterly* 40:360-369.
- GROVES, R. M., R. B. CIALDINI, AND M. P. COUPER. 1992. Understanding the decision to participate in a survey. *Public Opinion Quarterly* 56:475-495.
- KELLERT, S. R. 1979. Public attitudes toward critical wildlife and natural habitat issues, phase I. PB-80-138322. United States Department of Commerce, National Technical Information Service, Arlington, Virginia.
- KELLERT, S. R. 1980. American attitudes and knowledge of animals. *Transactions of the North American Wildlife and Natural Resources Conference* 45:111-124.
- KELLERT, S. R. 1987. The contributions of wildlife to human quality of life. Pages 222-229 in D. J. Decker and G. R. Goff, editors. *Valuing wildlife: economic and social perspectives*. Westview, Boulder, Colorado.
- KELLERT, S. R. 1993. The biological basis for human values of wildlife. Pages 57-58 in S. R. Kellert and E. O. Wilson, editors. *The biophilia hypothesis*. Island, Washington, D.C.
- KELLERT, S. R., AND J. K. BERRY. 1985. A bibliography of human-animal relationships. University Press of America, Latham, Maryland.
- MAY, A., J. AUSTIN, AND D. SLATE. 1991. Strategies to control rodent damage in sugar bushes: an update. *Proceedings of the Eastern Wildlife Damage Control Conference* 5:187-191.

- McIVOR, D. E., AND M. R. CONOVER. 1994. Perceptions of farmers and non-farmers toward management of problem wildlife. *Wildlife Society Bulletin* 22:212-219.
- NEUMAN, W. L. 1994. Social research methods: Qualitative and quantitative approaches. Allyn and Bacon, Needham Heights, Massachusetts.
- NORUSIS, M. J. 1990. SPSS/PC+4.0 base manual for IBM PC/ST/AT and PS/2. Marketing Department, SPSS Inc., Chicago, Illinois.
- OLSEN, M. E., D. G. LODWICK, AND R. E. DUNLAP. 1992. Viewing the world ecologically. Westview, Boulder, Colorado.
- PETERSEN, D. 1994. The killing fields. *Wilderness* 57:26-33.
- SCHMIDT, R. H. 1992. Why bad things happen to good animals. *Proceedings of the Vertebrate Pest Conference* 15:25-28.
- SCHMIDT, R. H., B. R. ACORD, AND D. W. HAWTHORNE. 1992a. Professionalism in wildlife damage management: issues and directions. *Transactions of the North American Wildlife and Natural Resources Conference* 57:115-124.
- SCHMIDT, R. H., D. L. BROOKS, AND T. P. SALMON. 1992b. Social, legal, and ethical aspects of animal damage management in forestry. Pages 395-404 in H. C. Black, technical editor. *Silvicultural approaches to animal damage management in pacific northwest forests*. United States Forest Service, Pacific Northwest Research Station General Technical Report 287.
- SCHUELER, D. G. 1993. Contract killers. *Sierra* 78:70-76.
- SHEKIN, I. M. 1985. Survey research for geographers. Association of American Geographers, Washington, D.C.
- STICKLEY, A. R. AND K. J. ANDREWS. 1989. Survey of Mississippi catfish farmers on means, effort, and costs to repel fish-eating birds from ponds. *Proceedings of the Eastern Wildlife Damage Control Conference* 4:105-109.
- STINCHCOMBE, A., C. JONES, AND P. SHEATSLEY. 1981. Nonresponse bias for attitude questions. *Public Opinion Quarterly* 45:359-375.
- STUBY, R. G., E. H. CARPENTER, AND L. M. ARTHUR. 1979. Public attitudes toward coyote control. United States Department of Agriculture, Economic Research Service Report 54, Washington, D.C.
- UNITED STATES BUREAU OF THE CENSUS. 1992. Statistical abstract of the United States: 1991. One hundred and eleventh edition. United States Government Printing Office, Washington, D.C.
- WOLFF, P. 1995. Waste, fraud and abuse in the United States Animal Damage Control Program. Second edition. *Wildlife Damage Review*, Tucson, Arizona.
- WYWIALOWSKI, A. P. 1994. Agricultural producers' perceptions of wildlife-caused losses. *Wildlife Society Bulletin* 22:370-382.



Douglas K. Reiter (center) is currently completing his M.S. degree in the Department of Forest Resources at Utah State University. Doug received his B.S. from the same department in recreation resource management. His research has focused on the human dimensions of natural resource management and policy. This research includes work on public perceptions of small predator management, visual quality of "new forestry" practices, and attitudes and beliefs of outdoor recreationists in the southwestern United States. **Mark W. Brunson** (left) is an associate professor of forest resources at Utah State University. His research focuses on public attitudes toward natural resources and management practices and on the relationships between people's attitudes, their ecological knowledge, and their behaviors in natural settings, as well as public policy arenas. He holds a B.A. from Binghamton University and M.S. and Ph.D. degrees from Oregon State University. **Robert H. Schmidt** (right) is an associate professor in the Department of Fisheries and Wildlife at Utah State University. He received his B.S. in natural resources from Ohio State University, an M.S. in forestry, fisheries, and wildlife from the University of Nebraska, Lincoln, and an M.S. and a Ph.D. in biological ecology from the University of California at Davis. His interests cover the spectrum of wildlife policy, ecology, and management. Robert was president of the Western Section of TWS in 1989 and currently serves as president of the National Animal Damage Control Association and as an Executive Board member of the Wildlife Damage Management Working Group of TWS.

Associate editor: Barnes

