

UC Agriculture & Natural Resources

Proceedings of the Vertebrate Pest Conference

Title

Assessing Educator Needs for Resources Associated with Integrated Vertebrate Pest Management

Permalink

<https://escholarship.org/uc/item/94g6f5g6>

Journal

Proceedings of the Vertebrate Pest Conference, 31(31)

ISSN

0507-6773

Authors

Vantassel, Stephen M.
Kruger, Megan
Buhler, Wayne
et al.

Publication Date

2024

Assessing Educator Needs for Resources Associated with Integrated Vertebrate Pest Management

Stephen M. Vantassel

Montana Department of Agriculture, Lewistown, Montana

Megan Kruger

West Virginia University, Morgantown, West Virginia

Wayne Buhler

North Carolina State University, Raleigh, North Carolina

Dana Sanchez

Oregon State University, Corvallis, Oregon

Paul Curtis

Cornell University, Ithaca, New York

ABSTRACT: Expertise in wildlife and vertebrate pest management (VPM) within the U.S. University Land Grant system is increasingly rare, and very few Extension educators have the knowledge and tools to address VPM practices in this very specialized area. Yet, Extension educators (i.e., agents) receive a myriad of inquiries from the public searching for information on resolving conflicts associated with wildlife. Our team developed and launched an online survey to assess the needs of Extension educators in western region states and territories of the U.S. to determine the desired content and format of educational resources concerning VPM. We plan to review and compile current VPM educational materials (e.g., factsheets, videos, etc.), revealed in the needs assessment or recognized by our team, and determine their applications for wider use, or for revision/enhancement to address resource shortfalls. Our end goal is to use the survey data to identify current gaps in VPM resources and develop new or revised materials for Extension educators and volunteers. Because these educators frequently serve as “first responders” for people seeking solutions for conflicts with vertebrate pests, Extension staff need unbiased, science-based resources and training materials to counter the misinformation on the internet and fraudulent products in the marketplace. We will also determine how to best format and deliver this information to key audiences and stakeholders.

KEY WORDS: education, extension educators, master gardener, needs assessment, pesticide environmental stewardship, surveys, training materials, vertebrate pest, western region, wildlife damage management

Proceedings, 31st Vertebrate Pest Conference (R. M. Timm and D. M. Woods, Eds.)
Paper No. 27. Published October 24, 2024. 4 pp.

INTRODUCTION

There are no national or state summary statistics available on the extent of damage or social and economic losses caused by wildlife (Messmer 2009). However, scientific survey data confirms that human-wildlife conflicts are increasing (Conover and Decker 1991, Conover 1997, 1998; Coates et al. 2010). In the western U.S., agricultural producers and forest landowners often suffer much of the damage caused by wildlife (Conover 1997). There is an urgent need to increase awareness and adoption of Integrated Pest Management (IPM) in vertebrate or wildlife pest management (i.e., economic losses directly caused by wildlife, Messmer 2000). Unfortunately, expertise in wildlife and vertebrate pest management within the Land-Grant University system is declining with changes in faculty positions and retirements.

The U.S. Land-Grant University system consists of institutions of higher learning established by the Morrill Act of 1862 (Bickel 2022). The Smith-Lever Act of 1914 used these universities to propagate research-based information to improve public welfare in agriculture, home economics, and other areas (Pinero et al. 2018) through Extension educators. Because Extension educators frequently serve as “first responders” for those seeking solutions to a conflict with wildlife, they need unbiased,

science-based resources (e.g., factsheets, web links) to counter the misinformation and sometimes fraudulent or illegal products marketed via the internet.

Our Collaboration Team (CT) came together at the Pesticide Applicator Certification and Training (PACT) meeting in Duluth, MN, in 2019. The National Pesticide Safety Education Center (NPSEC) supports the bi-annual PACT meetings and our CT through a U.S. Environmental Protection Agency (EPA) Cooperative Agreement. NPSEC is a non-profit organization with a mission to serve and support Extension Pesticide Safety Education Programs in every state and U.S. territory. Our CT is national in scope and composed of 44 individuals representing state Pesticide Safety Education Programs, IPM Programs, academia, state government agencies, and the U.S. EPA. Our mission is to identify and address educational needs and issues where Extension wildlife, IPM, and Pesticide Safety education and outreach overlap.

Our CT started with an initial objective of revising the IPM topic in the Pesticide Environmental Stewardship (PES) website (<https://pesticidestewardship.org>). PES is a virtual repository containing detailed descriptions and resources for 20 different pesticide safety/stewardship (core) topics. As our group had two internationally renowned experts in vertebrate pest management (Stephen Vantassel,

Montana Dept. of Agriculture, and Dr. Paul Curtis, Cornell University), and several individuals who majored in wildlife management in college, we decided to create a specialized website on wildlife damage management (<https://pesticidestewardship.org/wildlife-damage-management/>). It is now a prominent topic within the broader PES website. Popular content in this website included: When and how to contact a wildlife control professional, laws concerning wildlife damage management, wildlife-to-human disease transmission, and integrated wildlife damage management. The website made its public debut during the 2021 PACT meeting in Denver, Colorado, USA.

Based on our collective experience comprised of over 200 work years and confirmed by others (Pinerio et al. 2018, Gott and Coyle 2019), our team determined that Extension educators needed training and/or resources to help them respond to client requests, particularly where no Extension wildlife specialist was available within their Land Grant University. Such a train-the-trainer approach would have a “multiplier effect” by equipping and empowering Extension agents/educators to inform their clientele (Pinerio et al. 2015, 2018). For example, Extension agents could then train Master Gardener volunteers. The Master Gardener program includes people who are passionate about horticulture and desire to share their knowledge with the public. By training these volunteers, they, in turn, would educate the public and thereby increase the implementation of IPM for wildlife damage management. But rather than prescribing a top-down solution based on our opinions and experiences, we asked educators about their perceived needs and preferences for training materials to ensure applicability and encourage more buy-in from end-users.

While the national survey results will be published later, this article focuses on results from the western region, specifically the 17 western states and Pacific territories (i.e., Alaska, American Samoa, Arizona, California, Colorado, Guam, Hawaii, Idaho, Micronesia, Montana, Nevada, New Mexico, Northern Mariana Islands, Oregon, Utah, Washington, and Wyoming) served by the Western IPM Center (<https://www.ipmcenters.org/about/regional-ipm-centers/> accessed 22 Dec 2023).

SURVEY DESIGN

Our CT created a survey to query Extension educators about their VPM needs and preferences and tested a pilot version at the 2023 PACT meeting in Michigan (IRB Exemption Number 2304773065). The survey was designed to assess training needs in the entire United States, including tribal lands, and territories. Our survey consisted of 16 primary questions with some follow-up questions. We sought to investigate four major topics: 1) What area does the educator serve? 2) How often do clients request information on vertebrate pest management issues? 3) What is the scope and frequency of those informational requests? and 4) What educational format(s) or incentives would encourage you to participate in training events? We sought to construct a survey that would take respondents <20 minutes to complete. The survey employed a mix of multiple choice, open answer and Likert-scale questions. Questions were developed to gather needs

of the target audience and to identify gaps in knowledge, training, and access to information. Several were 5-point Likert-scale questions with ordinal measurement that asked respondents to rate their frequency of interactions, concern levels, and familiarity with vertebrate pest management topics. We tested content validity and face validity of questions before we sent the final survey instrument to respondents. Content validity was conducted first through a group of wildlife and pest management professionals. They were asked to evaluate the survey for correctness and to eliminate ambiguities. Face validity was then conducted with a group of pest management educators similar to the targeted respondents. That group was asked to check whether the questions were understandable and clear upon reading. They were also asked about how long it took them to complete and what, if anything, was confusing. After both validity checks, the final survey instrument was distributed to the intended population.

Respondents were emailed the survey link with a letter indicating why they were being asked to complete the survey. They were then prompted to agree or not agree to take the survey. Demographic questions, such as state or territory of work location, current role, and geographic area of coverage (e.g., county, multi-county, statewide or U.S Territory-wide) were asked to be able to filter responses based on these questions and create aggregated data based on state, role, or coverage area. Interactions with clientele groups were measured with questions using a 5-point Likert scale. We asked about various categories of clientele and how often they interacted (interact was defined as facilitating programs, fielding calls, office drop-ins, or emails) with them (never, four times or less per year, monthly, weekly, or daily). Respondents were asked to rate their preparedness to discuss 10 vertebrate pest management information and techniques on a 5-point scale (not at all, slightly, moderately, very, or extremely prepared).

To assess species-specific concerns from our respondents, we asked them to rank categories of pest types for concern in their geographic area. The categories were rodents, birds, carnivores, reptiles, amphibians, and other mammals (e.g., deer, elk, bats, rabbits). Respondents ranked each category as either low concern, moderate concern, or high concern. Directly following that question, we asked an open-ended question that instructed respondents to list the top 5 vertebrate species of highest concern in the area they served. They were prompted to type in species name in order of concern.

Finally, to investigate how our respondents found information regarding vertebrate pest conflicts, we asked them to rate 7 categories of information sources. They placed them in order from most (coded as 1) to least use (coded as 7). Categories included internet/browser search, books, extension publications, state or federal wildlife agency, local wildlife sanctuary, or academic/peer reviewed journals.

RESULTS

We received responses (n=97) from 15 of the 17 states or territories in the Western IPM Region (Figure 1). Staff from Micronesia and the Northern Mariana Islands did not respond. Also, we were unsuccessful in generating responses

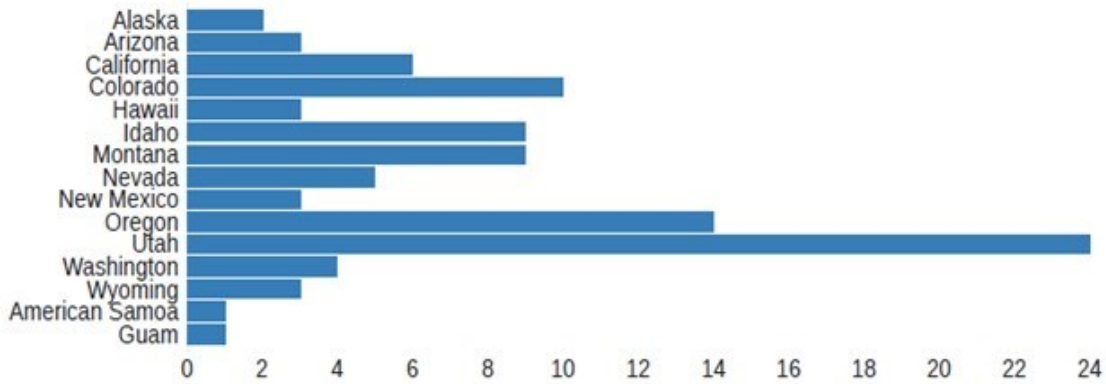


Figure 1. Number of respondents by state or territory from the western region of the U.S. and outlying territories who completed the vertebrate pest management needs assessment questionnaire (n= 97 respondents).

from tribal nations. Most respondents held jobs with educational institutions or governmental wildlife agencies (state or federal). The majority of respondents were Extension educators (n=30), followed by state or federal agency staff (n=23) and statewide Extension specialists (n=11). Interestingly, 25 of 97 respondents (26%) classified themselves in the “other” category suggesting that several non-traditional educators were responding to wildlife damage complaints.

The survey respondents reported that most of their questions about vertebrate pest management come from homeowners/renters, followed by farmers, and then ranchers. About half (n=50) of the respondents said they had monthly, weekly, or daily contact with these clients. The average number of client questions per year handled by respondents was greatest from professional pesticide applicators (n = 34), followed by homeowners/renters (n = 32), and then wildlife-related professionals (n=30).

Compared with previous years, the number of vertebrate pest questions was either increasing (n= 34) or staying the same (n=32). Only 4 of 70 respondents indicated vertebrate pest questions were decreasing. Questions were most likely to be associated with wildlife damage to gardens, agricultural lands/crops, or turfgrass.

Many respondents said they were “not at all” prepared to discuss topics (Table 1) such as nuisance wildlife permits (mean=2.23, SD=1.37), translocation/relocation (mean=2.46, SD=1.39), humane dispatch (mean=2.73, SD=1.54), trapping (mean=2.80, SD=1.40), or carcass disposal (mean=2.81, SD=1.51). Respondents felt at least moderately competent talking about federal laws and regulations (mean=2.86, SD=1.20), chemical control (mean=3.01, SD=1.12), state laws and regulations (mean=3.04, SD=1.21), and exclusion methods (mean=3.25, SD=1.40).

The wildlife pests of highest concern for respondents were rodents (mean=2.6, SD=0.70). Carnivores (mean=2.2, SD =0.68), other mammals (i.e., deer, elk [*Cervus canadensis*], feral pigs [*Sus scrofa*], etc.; mean= 2.1, SD = 0.71), and birds (mean=2.0, SD=0.70) were also of moderate concern. Few people had concerns reptiles (mean =1.2, SD=0.51) or amphibians (mean=1.1, SD=0.38). The top 5 vertebrate pest species mentioned in an open-ended question included coyotes (*Canis latrans*, n=34), deer

(n=32), mice/rats (*Mus* spp. and *Rattus* spp., n=29), gophers/pocket gophers (*Geomys* spp., n=25), and raccoons (*Procyon lotor*, n= 9). Extension publications and an internet browser search were the two most likely sources for finding information from a list of options associated with vertebrate pests.

DISCUSSION

Extension educators, technical specialists, and Master Gardener volunteers were just a few of the educator types consulted by the public when seeking quality information concerning ways to resolve human-wildlife conflicts. However, it was interesting that about one-quarter of our respondents were not in these typical educator or specialist roles. Clients are seeking out other professionals to find technical information needed to resolve problems associated with wildlife. We need to think beyond typical Extension audiences and delivery methods to reach these new professional groups with quality VPM information.

As suburban expansion continues, and audiences become more urban with a decreased understanding of the natural environment, conflicts (both real and perceived) between humans and wildlife will continue to grow within

Table 1. How prepared survey respondents were to discuss wildlife-related topics with their clients (1=not at all prepared, 5=very prepared).

	Mean	SD	Count
Nuisance wildlife permits	2.23	1.37	70
Relocation/translocation	2.46	1.39	71
Dispatching (euthanasia)	2.73	1.54	70
Trapping	2.80	1.40	71
Disposal of carcasses	2.81	1.51	70
Federal regulations/laws	2.86	1.20	71
Repellents	2.86	1.20	71
Use of chemical control	3.01	1.12	71
State regulations/laws	3.04	1.21	69
Exclusion methods	3.25	1.40	71

the U.S. Expertise in VPM within the University Land Grant system is increasingly rare given retirements and changes in faculty positions. Very few Extension educators have the knowledge and tools necessary to address wildlife damage concerns in this very specialized area. For example, 47% of respondents were not prepared to address questions concerning nuisance wildlife permits, and 36% of respondents could not address questions associated with animal euthanasia (Table 1).

Our goal is to use this survey data to identify current gaps in VPM resources and develop new or revised materials for Extension educators and volunteers. We plan to compile current VPM educational materials (e.g., factsheets, videos, etc.), revealed in the needs assessment, and recognized by our team, determine their applications for wider use, or for revision/enhancement to address resource shortfalls. We will also determine how to best format and deliver this information to key audiences and stakeholders.

Thus far, we have only analyzed data for the western region states and territories. We are planning a more thorough analysis of vertebrate pest management information from across the entire U.S. and several territories (n > 790 responses). We expect to see regional differences in the types of wildlife complaints received and potentially the client groups being served. This will help inform us of the types of new educational resources and potential delivery methods. We have also received funding from the Western IPM Center to develop new online resources to address priority VPM concerns.

LITERATURE CITED

- Bickell, E. G. 2022. The U.S. Land-grant university system: overview and role in agricultural research. Congressional Research Service (Aug 9) R4897. <https://crsreports.congress.gov/product/pdf/R/R45897>
- Coates, R. W., M. J. Delwiche, W. P. Gorenzel, and T. P. Salmon. 2010. Evaluation of damage by vertebrate pests in California vineyards and control of wild turkeys by bioacoustics. *Human-Wildlife Interactions* 4(1):130-144.
- 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. 1998. Perceptions of American agricultural producers about wildlife on their farms and ranches. *Wildlife Society Bulletin* 26:597-604.
- Conover, M. R., and D. J. Decker. 1991. Wildlife damage to crops: perceptions of agricultural and wildlife professionals in 1957 and 1987. *Wildlife Society Bulletin* 19(1):46-52.
- Gott, R.C. and D. R. Coyle. 2019. Educated and engaged communicators are critical to successful integrated pest management adoption. *Journal of Integrated Pest Management* 10(1):35; 1-5. DOI: 10.1093/jipm/pmz033
- Messmer, T. A. 2000. Emergence of human-wildlife conflict management: turning challenges into opportunities. *International Biodeterioration* 45:97-100.
- Messmer, T. A. 2009. Human-wildlife conflicts: emerging challenges and opportunities. *Human-Wildlife Conflicts* 3(1): 10-17.
- Piñero, J. C., J. Quinn, P. Byers, P. Miller, T. Baker, and D. Trinklein. 2015. Knowledge and use of Integrated Pest Management by underserved producers in Missouri and the role of extension. *The Journal of Extension* 53(3):Article 17.
- Piñero, J. C., K. Paul, P. Byers, J. Schutter, A. Becker, D. Kelly, and D. Downing. 2018. Building IPM capacity in Missouri through train-the-trainer workshops and effective partnerships. *Journal of Integrated Pest Management* 9(1):24;1-6.