

## **Fostering Greater Professionalism with Firearms in the Wildlife Arena**

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**ABSTRACT** Wildlife biologists often use firearms in a professional capacity. However, few wildlife professionals receive in-depth or specialized training in the use of firearms. Other professionals who use firearms in the course of their duties (i.e., law enforcement or the military) receive extensive training appropriate to the level of their intended use. But, in general, there are no such requirements or recommendations for wildlife professionals. In addition, the information that is often available regarding firearm selection, maintenance, and use, terminal ballistics on various species of wildlife, humaneness of shot placement, and other aspects related to the use of firearms on wildlife, is often based on opinion, subjective tests, or insufficiently designed statistical testing. We examined the various requirements for firearms training, current level of knowledge about the use of firearms related to wildlife management, and provide suggestions for training and future research.

**KEY WORDS** firearms, wildlife damage management, shooting, training

Wildlife professionals need a wide range of knowledge to be effective. Wildlife jobs are diverse and can include setting harvest limits on game species, recovering endangered species, or controlling overabundant and exotic wildlife. In wildlife programs at universities, aspiring biologists learn the basic theories and tools needed to begin our career. Once the first job is obtained, professionals begin learning what it takes to do many new tasks. For areas where biologists do not have prior experience or training, they often receive on-the-job training, get sent to internal or external training, or are responsible for obtaining the necessary skills somehow. One of these areas is the use of firearms for wildlife damage management, wildlife disease surveillance, and population management. A basic introduction to firearms may be provided in a wildlife techniques, wildlife damage management, or similar class. In the past, many wildlife professional probably came to universities having been hunters or with experience from the military. However,

due to changing demographics, this may not be the case. It appears that more students in the wildlife profession have little or no previous firearms experience.

As firearm instructors, we are interested in the knowledge, skills, and abilities of our students, what is important for them to know, and how to best go about providing that information. To do this, we believe wildlife professionals should know as much about firearms as other tools used in our field, such as chemical immobilization equipment, radio telemetry, or population estimation techniques. This advanced knowledge can be critical in certain circumstances, such as wildlife control in urban and airport environments. If shooters are not precise when shooting in an urban environment or select the wrong equipment, the consequences can have a higher cost than missing a shot in the woods while hunting. Each of us has shot throughout our lives and careers, and often thought our knowledge was adequate. As we began to explore various aspects of firearm

knowledge, we realized what we did not know but should know to meet our standard of professionalism. We also found that much of the knowledge that is available is not produced or distributed in the same ways as information about other techniques in the field and, in some cases, not available at all or only in anecdotal form.

We were also interested in the level of knowledge of other wildlife professionals. As fewer individuals enter the wildlife profession with a hunting background, fewer will possess even basic knowledge and proficiency with guns. While the use of firearms is not critical for every wildlife management position, it is extremely important in the fields of game management and wildlife damage management. Managers in these areas must have a level of understanding above that of the general hunting public to effectively regulate the use of firearms for hunting (in the case of the game manager) or have this tool available to them as part of an integrated wildlife damage management plan (in the case of the wildlife damage manager). The objective of this paper is to explore the current level of knowledge of firearms that is applicable to wildlife damage management, current knowledge and training requirements for wildlife damage managers, provide suggestions on how to improve what we already know, and to spark discussion among wildlife professionals on this topic.

## **WHAT DO WE KNOW**

In preparation for teaching advance-level firearms classes, we found a distinct disparity between the type of information available about the application of firearms for wildlife management and the application of other wildlife management tools. Much of what we know is found in popular press, the internet, or what we hear on a Saturday afternoon at the shooting range versus the standard by which we manage wildlife;

peer-reviewed scientifically-derived information. We feel that this is an appropriate benchmark for firearm knowledge for the professional use of firearms because our profession and the other tools we used are based on this standard. However, what we found is that there is a limited amount of information about firearms that meet this benchmark.

To determine the extent of the available peer-reviewed information on firearms used for wildlife management, we conducted a brief literature search and began evaluating the information. We searched several databases including Google Scholar, Wildlife and Ecology Studies Worldwide, and Web of Science using the following keywords: wildlife and firearm; wildlife and shooting; and wildlife and bullet. Even though firearms are a widely used tool in wildlife management, we found few publications in the published literature. We found 2 articles that met the exact objective of our inquiry (Parker et al. 2006, Oen and Knudsen 2007). The closest related sets of articles researched waterfowl and lead shot (19 publications) and the effects of lead bullets in animals and the potential effects of consumption by humans or animals (17 publications and more that are in preparation or in press). We found no articles that discussed the use of, or the effectiveness of specific equipment for wildlife damage management (e.g., sound suppressors, night vision, thermal imaging, non-lead bullets, or bullet design), human dimensions research related to the use of firearms for wildlife damage management (e.g., public acceptance of these tools for managing wildlife damage, perception of the use of sound suppressors, perception of firearms use in suburban areas by trained professionals), effects of firearms training, or other topics relevant to conducting wildlife damage management operations.

Parker et al. (2006) and Oen and Knudsen (2007) both examined the effect of bullet selection on a specific species. A critical aspect of applying firearms to wildlife damage management is selecting the proper caliber of firearm to use for a particular situation. An ideal cartridge would be one that can rapidly and humanely incapacitate the target animal, with little or no over-penetration; be nontoxic to potential consumers, as in the case of meat donation programs; and be cost effective. Each criterion for cartridge selection is measurable and would provide beneficial information to decision makers; however, articles of this type are rarely published in peer-reviewed publications.

What is available is found on the internet, popular press books, and hunting magazines. Most of this is probably based upon the authors' experiences, possibly what other states have done, or what our elders have passed down. While these observations may be accurate, it is difficult as an instructor or student to evaluate the validity of a particular statement without adequate methodology or statistical information. New shooters may have greater difficulty in determining what is accurate or valid information. The internet is probably the most widely used method for learning new information today; however, the information ranges from accurate to incorrect. Determining what information to believe often involves having an understanding of the subject beforehand. Those seeking information beyond what they know may have difficulty in discerning what to believe.

In comparison, other agencies, such as military and law enforcement conduct and publish research on the use of firearms relevant to their profession including the effects of shootings, "stopping power" of various calibers, forensics, effects of training, effects of firearms on public health

and safety, and other areas related to their respective professions. This research can then be used by the firearms instructor and the advanced end-user to improve their classes and their skill, respectively. This research is an important component that is missing from wildlife management and the professional use of firearms.

## **CURRENT STANDARDS OF TRAINING IN THE WILDLIFE PROFESSION**

Although many wildlife professionals have experience with hunting or recreational shooting, many have not received formal training in the professional and proficient use of firearms. Instead, they have what we term a "hunting-level" of knowledge about firearms – they are comfortable around guns and may even be proficient, but they lack "professional-level" knowledge about firearms, such as that garnered by law enforcement and military personnel.

So, wildlife professionals don't inherently possess professional-level knowledge about firearms, and wildlife agencies rarely require or provide such training. In general, agencies and organizations employing wildlife professionals have no or limited expectations for firearms training. In instances where some training is required, it typically is safety training and does not include information about the use of firearms in a professional situation. There are some exceptions to this, however. Some programs within the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) program, for example, require some annual display of skill through qualification or testing.

We opine that many wildlife professionals using firearms in the field are not adequately trained to do so. Firearms can be a lightning rod for controversy. Certainly,

many people are not comfortable with wildlife professionals using firearms to take wildlife at all, and few would be comfortable if they knew how little firearms training most wildlife professional have experienced.

In 2005, the Berryman Institute developed an advanced firearms training workshop for wildlife professionals. After several of these workshops were presented, we were struck by how little most wildlife professionals knew about firearms. Many of these professionals have used firearms on a daily basis, but lacked what we considered to be basic knowledge. During these training programs, we found that most students had inadequate knowledge about cleaning techniques, setting up firearms (e.g., mounting scopes properly, evaluating trigger pull, action mounting, etc.), ballistics, and general maintenance. However, during the live-fire exercises, we observed a wide range of marksmanship.

Again, more individuals are entering the profession without a background in hunting or shooting. Certainly, many of these individuals need to receive training to equip them with basic knowledge about and skills with firearms. Moreover, our observations suggest that even those professionals with life-long experience with guns possess limited, and often incorrect, knowledge and skill that fails to meet the benchmark of professionalism our profession and our publics expect. It is perhaps even more important to provide additional training to these individuals, who may have a high degree of confidence with guns but that is not matched by their knowledge and skill.

#### **HOW CAN WE KNOW MORE**

An important step to knowing more is to understand what we currently know and what we currently believe to be important. This can be done through surveys of wildlife professionals to assess what is currently

known, what they believe to be important for new and current professionals to know, and how many resources can realistically be devoted to training and education. Once a survey of this type is completed, then instructors can begin to tailor their programs to best meets the needs of the end-user.

Training should reflect the different uses as well as the skill level of the individual. One method to address this is to develop a set of shooting standards based on specific duties such as the urban/suburban shooters, the occasional shooter (i.e., backups to regular shooters), rural long-range shooters, trappers, and emergency responders who may have to deploy and function at any of the aforementioned levels. Each type of shooter has different responsibilities and needs for knowing their own ethical limits. We define an ethical limit as the longest shot that can be taken that will humanely kill the target with low chance of missing the target area and no compromise of safety. This is a quantifiable quality of a shooter that can be used as an objective method for evaluating a shooter's skill level. For some shooters, such as the shooter who regularly shoots coyotes in wide open western landscapes, their ethical limit may be over 1,000 yards. However, the same shooter may need to reduce that limit in a different situation, such as an airport or urban setting. Approaching training in this method would also reduce the disparity between other professional users and wildlife damage managers.

Defining recommendations for qualifications, certifications, and refresher training should also be addressed. Qualifications are typically used to show a particular level has been achieved. Certification is used to show that a particular qualification level is maintained. Refreshers are used to bring that shooter back to the previous qualification that has perhaps lapsed. Because skills decay over time (Arthur et al. 1998), many law enforcement



agencies require monthly certifications to ensure their operators are at a ready state (Plaster 2006). On the 10 April 2009 episode of 20/20 (ABC), Diane Sawyer interviewed 2 police firearms instructors from Philadelphia, Pennsylvania. One of the questions she asked was how long before firearms skills begin to deteriorate. They responded that after a month or two, even professionals who possess a high level of training, shooting skills will begin to diminish. Arthur et al. (1997) found that accuracy-based tasks were more susceptible to skill loss than physical or natural tasks. This type of research could be applied to shooting skill to determine what level of routine practice or field use is necessary to maintain skills at a desired level for each duty type.

Additional research is also needed, such as the distribution of lead throughout a carcass or performance of new nontoxic bullets for wildlife removal. We believe this can be accomplished by field personnel during routine practice or during wildlife damage operations. Working with a team knowledgeable about firearms, research protocol, statistical analysis, and field application can result in practical research to address some of the deficiencies in our knowledge pointed out above. In an academic setting, these may be used for senior projects or as part of a larger, related graduate project. For example, Schwartz et al. (1997) conducted a field test for the use of succinylcholine chloride as method for chemical immobilization and euthanasia with a captive bolt gun. To measure the stress on the deer, they collected blood and analyzed it for blood cortisol levels. As a baseline for comparison, they measured cortisol levels from captive deer euthanized via gunshot to the head. This data provided some evidence that shooting deer in the head is a humane method for euthanasia. To expand on this, field personnel could collect

blood from deer shot with varying wound locations, bullet design, caliber, body size, species of deer, etc. to further evaluate the use of firearms as a humane method for removing deer. Because much of this research could be incorporated into existing projects, costs would be minimized.

## CONCLUSIONS

As we've talked to several people about this topic, many grow wide-eyed when they realize that 1) most wildlife professionals, even those that grew up hunting, actually have limited knowledge about guns and 2) that wildlife agencies often issue them a gun and send them to the field with little training or assessment of proficiency. We believe this deficiency in both our knowledge and training can easily be addressed through proactive planning. We also believe that not addressing this situation has the potential to cause problems for both wildlife management agencies and private wildlife control operators as new professional may come into the field with a decreasing amount of knowledge about firearms.

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