

A word from USDA

In response to the questions posed in this scenario, the United States Department of Agriculture, Animal and Plant Health Inspection Service, Animal Care (USDA, APHIS, AC) offers the following guidance:

This scenario raises questions about the regulatory requirements for personnel training and ensuring the humane death of an animal as it applies to activity using wildlife. For activity regulated by the Animal Welfare Act (AWA), the IACUC is required to assess whether the method chosen for humane destruction produces rapid unconsciousness and subsequent death without pain or distress, as defines euthanasia (§2.31, §1.1; ref. 1). In the case of wildlife research, acceptable resources for this information include but are not limited to the American Veterinary Medical Association's *Guidelines for the Euthanasia of Animals*², expert consultants (§2.31(c)(3); ref. 1) and recommendations from taxon-specific organizations such as the American Society of Mammalogists.

Under the AWA regulations, the IACUC is qualified to assess the research facility's animal program, facilities and procedures; hence methods to assess proficiency and training are at the discretion of the IACUC (§2.31(a); ref. 1). It is the IACUC's responsibility to confirm that death is achieved appropriately when necessary, and it is the institution's responsibility to make training available and ensure that all personnel working with animals are qualified to perform their tasks (§2.32; ref. 1).

1. Animal Welfare Act regulations. 9 CFR. Chapter I, Subchapter A, Part 2, Subpart C.
2. American Veterinary Medical Association. *AVMA Guidelines for the Euthanasia of Animals: 2013 Edition*. (American Veterinary Medical Association, Schaumburg, IL, 2013).

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but necessary for most, if not all, such activities in field settings. The lack of fit shows in a number of ways, including bullet placement (the skull is of interest in most field studies with animals) and cartridge and bullet selection to minimize damage to the specimen while still ensuring a humane death. The literature cited throughout this section of the AVMA guidelines focuses on agricultural animals¹ and the recommendations listed there are inappropriate extrapolations to most species of wildlife. For instance, the guidelines¹ state that the minimum muzzle energy suitable for animals weighing 180 kg or less is 407 J. A quick web search shows that one must use a .357 Magnum cartridge or larger caliber in a handgun to achieve 407 J consistently with readily available ammunition. This level of energy is extremely excessive and indeed hazardous for animals the size of a skunk, raccoon or coyote at ranges appropriate for euthanasia. A shot passing through the brain would aerosolize brain tissue and thus potentially rabies virus if present. Needless to say, it would render the entire skull and more of the animal of little value for research purposes. Though not addressed in

the scenario, firearms (mostly shotguns) are widely used to collect birds, often while in flight, and in such situations it is impossible to point a shotgun such that any one of its hundreds of projectiles will pass through the brain. Further, the muzzle energy levels specified by the AVMA guidelines have no relevance when the method of death depends on the retained energy of individual pellets from a shotgun. A .22 LR round is entirely sufficient for euthanasia as defined by the AVMA (shot passing through the brain) for all of the species listed if immobilized in traps, with the potential exception of larger species of deer, and a .22 Short would likely be a better option for the smaller species. If used for humane killing at longer ranges rather than euthanasia, a higher velocity .22-caliber round might be needed for larger carnivores, and a larger caliber and higher velocity rifle might be needed for humane killing of animals the size of deer. Resources for the use of firearms when collecting mammals and birds for research purposes include guidelines published by the American Society of Mammalogists² and the Ornithological Council³.

1. American Veterinary Medical Association. *AVMA Guidelines for the Euthanasia of Animals: 2013 Edition*. (American Veterinary Medical Association, Schaumburg, IL, 2013).
2. Sikes, R.S., Gannon, W.L. & the Animal Care and Use Committee of the American Society of Mammalogists. Guidelines of the American Society of Mammalogists for the use of wild mammals in research. *J. Mamm.* **92**, 235–253 (2011).
3. Fair, J., Paul, E. & Jones, J. (eds.) *Guidelines to the use of Wild Birds in Research* 3rd edn. (The Ornithological Council, Washington, DC, 2010).

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RESPONSE

The details are what matter

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Stevens has a valid concern, and the lack of a firearms training program for wildlife researchers at Great Eastern University does not shield the IACUC from its duty to promote safety and require technical proficiency in all areas of mammal care and use. The AVMA euthanasia guidelines¹ recognize that gunshot may be a practical method of euthanasia when “performed by highly skilled personnel trained in the use of firearms,” and the guidelines of the American Society of Mammalogists² state that “investigators using this method must be experienced in safe handling of firearms.” We agree that gunshot can be an effective method of euthanasia, and there are situations, particularly with unrestrained mammals in a field situation, where gunshot is the preferred technique.

There are four criteria that should be met before IACUC approval, however. The first is that the researcher should consider alternatives to gunshot and justify why gunshot is the best method possible under the circumstances. The second criterion is that the researcher should clarify what the protocol means by ‘gunshot’. Not all firearms and ammunition are the same, and shooting a trapped animal from 3 meters away is different from shooting a running animal from a distance of 60 meters. A generic use of the term ‘gunshot’ should be a red flag for