**Testimony in Support of HB 863: Bill to Ban Organized Hunting Contests**
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House Environment & Transportation Committee

We, the undersigned scientists, submit this testimony in support of HB 863 to ban wildlife killing contests for furbearing and unprotected species in Maryland. During these events, participants compete to kill wild animals—including foxes and coyotes—for prizes or monetary awards. Wildlife killing contests do not serve any genuine wildlife management goal and are symptomatic of a broader problem of misguided wildlife governance that fails to recognize and value the crucial ecological roles of wild animals.

Enclosed with this testimony is a statement in opposition to wildlife killing contests that has been signed by over 70 canid and conservation scientists, including ourselves. That statement details the scientific reasons to ban killing contests, demonstrating why wildlife killing contests are detrimental to ecosystems and fail to achieve the goals that killing contest organizers and participants claim their events will achieve. It includes citations to the best available, peer-reviewed science.

In short, the statement dispels myths that indiscriminately killing carnivores, as occurs in wildlife killing contests, will achieve common wildlife management objectives of reducing the loss of livestock to predation; increasing the abundance of ungulates (including deer); or preventing coyote populations from growing out of control. Lessons from science demonstrate that indiscriminate lethal control of carnivores may even increase depredation of livestock and increase coyote populations. Public education and the use of nonlethal methods are the only effective, long-term solutions to addressing and preventing conflicts with wildlife.

Beyond science, there are other reasons to ban wildlife killing contests. Killing animals for a prize and without adequate reason is unjustified and unsportsmanlike. The events are unethical and threaten the reputation of hunters and the future of hunting in general. We should celebrate the valuable contribution that wildlife provides to the health and vitality of our ecosystems. For these reasons, we urge you to support HB 863. Thank you for your consideration.

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# Statement in Opposition to Wildlife Killing Contests

*Signed by more than 70 conservation scientists*

On behalf of Project Coyote's Science Advisory Board and the undersigned scientists, we express our support for the prohibition of wildlife killing contests—events in which participants compete to kill bobcats, coyotes, cougars, foxes, or even wolves for prizes or entertainment. These events are promoted throughout the United States.

The most general reason to prohibit wildlife killing contests is that hunters and wildlife managers believe, as a community, that killing animals without an adequate reason is unjustified and unsportsmanlike. Killing an animal for a prize or trophy constitutes killing without an adequate reason. Insomuch as wildlife killing contests are primarily motivated by killing for a prize or trophy, they are wrong.

Some advocates of killing contests argue that they are important for achieving management objectives for other species, especially game species. There is no credible evidence that indiscriminate killing of coyotes (the most common targets of killing contests) or other predators effectively serves any genuine interest in managing other species. If leaders in the hunting and wildlife management community believe that wildlife killing contests, in general, serve important objectives, then the principles of wildlife management mandate that (1) these objectives be articulated and vetted by the best-available science, and (2) some reasonable, science-based case be made to justify a killing contest as an appropriate means for achieving these objectives. In the absence of such an evaluation, these events should be prohibited.

Advocates of wildlife killing contests might argue that they are an important means for realizing one or both of these objectives: (1) decrease the loss of livestock to depredation, and (2) increase the abundance of prey species in the interest of maximizing hunting success by humans.

With respect to objective (1), a great deal of science has been developed on how to effectively manage depredations, including both lethal and non-lethal methods. Lessons from that science include:

(i) Indiscriminate killing is ineffective and it is plausible, perhaps likely, that when associated with a killing contest it would lead to increased risk of depredations. A primary reason for this concern is that only some, often only a few, individual predators participate in depredation. Indiscriminate and "pre-emptive" killing of predators associated with these events can lead to the disruption of predators' social structure and foraging ecology in ways that increase the likelihood of depredations. In hunted (exploited) coyote populations, for example, the number of surviving pups that must be fed by the alpha parents and the number of transient individuals may increase. These factors may predispose more coyotes to depredate livestock.

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(ii) The indiscriminate killing associated with a wildlife killing contest does not target: (a) the offending predator, (b) the site where depredation has occurred, and (c) the time when depredation has occurred. This renders the competitions ineffective as a means of depredation control.

While managing to reduce the loss of livestock is a common goal for all stakeholders, wildlife killing contests do not contribute to this goal and may work against it.

With respect to objective (2), a large body of science indicates that killing predators, especially under circumstances associated with killing contests, is not a reliable means of increasing ungulate abundance. The circumstances most likely to result in increased ungulate abundance are also the circumstances most likely to impair important ecosystem benefits and services that predators provide. Even when predators are killed to the point of impairing the ecosystem services, there is still no assurance that ungulate abundance will increase. The reason being is that ungulate abundance is frequently limited by factors other than predators—factors such as habitat and climate.

Beyond objectives (1) and (2), which focus on affecting game populations and livestock depredations, lies a need to better recognize and celebrate the predators' valuable contribution to the health and vitality of our ecosystems. For example, predators serve human interests through beneficial effects such as rodent control and disease prevention and promoting diverse plant communities and soil fertility. Thus, reduction of the distribution and numbers of apex predators can have detrimental ecological effects.

Some advocates of wildlife killing contests might also believe that killing coyotes is vitally important for preventing coyote populations from growing out of control. This concern is unjustified. Science demonstrates that unexploited coyote populations self-regulate their numbers by means of dominant individuals defending non-overlapping territories and suppressing subordinate pack members from breeding.

Opposition to wildlife killing contests is growing rapidly. New Mexico and Vermont abolished coyote killing contests in 2019 and 2018, respectively. The California Fish and Game Commission banned the awarding of prizes for killing furbearing and nongame animas in 2014. Local governments in Arizona, New Mexico and Wisconsin have condemned the events.

In 2018, hunter and Chairman of the Oregon Fish and Wildlife Commission Mike Finley condemned wildlife killing contests as "slaughter fests" and "stomach-turning examples of wanton waste." Former President of the California Fish and Game Commission and waterfowl hunter Mike Sutton denounced the events as "unethical" and "an anachronism [with] no place in modern wildlife management." The Vermont Fish and Wildlife Department stated, "coyote hunting contests are not only ineffective at controlling coyote populations, but these kinds of competitive coyote hunts are raising concerns on the part of the public and could possibly jeopardize the future of hunting and affect access to private lands for all hunters." The Wildlife Society issued a position statement in 2019 recognizing that "while species killed in contests can be legally killed in most states, making a contest of it may undermine the public's view of ethical hunting" and discouraging "contests that portray hunting in an unethical fashion."

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## Appendix A. Additional Literature Cited

Here we provide additional scientific explanation (with citations) for two ideas expressed in this letter.

(1) **Some advocates of wildlife killing contests (WKCs) believe they are necessary or beneficial for effective management of livestock depredation.** We indicated that WKCs are unlikely to have this effect. The reason why is that most individual predators do not participate in livestock depredations (Gipson 1975; Knowlton et al. 1999; Sacks et al. 1999a, 1999b; Linnell et al. 1999; Stahl and Vandel 2001; Blejwas et al. 2002; Treves et al. 2002; Treves and Naughton-Treves 2005). Consequently, effective management of depredation requires (1) targeting the offending individual(s), and (2) intervening close to the site where the depredations occurred as well as responding in a timely manner (Gipson 1975; Sacks et al. 1999a, 1999b; Smith et al. 2000; Bangs and Shivik 2001). WKCs do not represent the kind of targeted effort required for effective management of livestock depredations.

Moreover, indiscriminate killing of predators is likely to exacerbate risks to livestock. The reason is that killing social carnivores like coyotes (and wolves) can lead to the disruption of predators' social and foraging ecology in ways that increase the number of transient individuals (Bjorge and Gunson 1985; Haber 1996; Treves and Naughton-Treves 2005; Brainerd et al. 2008). These transient individuals that have not been acculturated (aversively conditioned) to living in areas with livestock may be more likely to kill livestock. Studies by USDA's Wildlife Services clearly indicate that many, if not most, depredations are inflicted by the breeders (i.e., alphas) in coyote social groups (Knowlton et al. 1999; Sacks et al. 1999b). Even if the offending individuals are removed, they can be replaced by other members of the social group or from populations outside the area where the WKC is occurring. In some cases, this can also increase reproductive performance in coyotes (Crabtree and Sheldon 1999; Knowlton et al. 1999). Scientific evidence is increasingly suggesting that harvesting predators can exacerbate losses to livestock (Collins et al. 2002; Treves et al. 2010, Peebles et al. 2013, Wielgus and Peebles 2014).

(2) **Some advocates of wildlife killing contests believe they are necessary or beneficial for increasing the abundance of ungulate populations. We had indicated in our letter that WKCs are unlikely to have that effect.** The reason why is two fold:

(i) Killing predators cannot result in increased ungulate abundance in cases where the ungulate population is not limited by predators, but is instead limited by other factors, such as climatic conditions or food availability (Sæther 1997; Forchhammer et al. 1998; Coulson et al. 2000; Parker et al 2009). Without careful study, the claim that killing predators will improve wild ungulate populations is simply an unsupported assumption. Moreover, scientists are not good at understanding the conditions that cause a population to be limited by predators as opposed to other factors (Vucetich et al. 2005; Wilmers et al. 2006). For example, an experimental study in Idaho (Hurley et al. 2011) found that annual removal of coyotes was not an effective method to increase mule deer populations because coyote removal increased neonate fawn survival only under particular combinations of prey densities and weather conditions.

(ii) Even in cases where predators do limit prey abundance, human-caused mortality (HCM) could only lead to an increase in prey abundance if the rate of HCM was sufficient to result in a significant reduction in predator abundance. Human-caused mortality is not a reliable means of reducing coyote abundance unless the rate of HCM exceeds 70% (Connolly and Lonhurst 1975). It is difficult to

imagine that any set of WKCs would be intense enough or frequent enough to result in that rate of HCM.

Finally, the interest of some advocates of WKCs (i.e., increased ungulate abundance) is antithetical to good natural resource management practices in cases where increased ungulate abundances present a risk of overbrowsing (e.g., Côté et al. 2004).

Thank you for allowing us to further explain ourselves. If additional explanation on this or any other topic would be of value, please let us know. We would be eager to provide any such explanations.

## Citations


Bangs, E., & Shivik, J. A. (2001). Managing wolf conflict with livestock in the northwestern United States. USDA National Wildlife Research Center-Staff Publications, 550.

Blejwas K.M., Sacks B.N., Jaeger M.M., McCullough D.R. (2002). The effectiveness of selective removal of breeding coyotes in reducing sheep predation. J Wildl Manage 66, 451-462.

Brainerd, S. M., Andrén, H., Bangs, E. E., Bradley, E. H., Fontaine, J. A., Hall, W. & Wydeven, A. P. (2008). The effects of breeder loss on wolves. The Journal of Wildlife Management, 72(1), 89-98.

Bjorge, R. R., and J. R. Gunson. (1985). Evaluation of wolf control to reduce cattle predation in Alberta. Journal of Range Management 38:483-486.

Collins, G.H., R. B. Wielgus, And G. M. Koehler. (2002). Effects of sex and age on American black bear conifer damage and control. Ursus 13:231–236.

Connolly, G. E., and W. M. Longhurst. (1975). The effects of control on coyote populations: A simulation model. Division Agricultural Science, University of California, Davis, Bulletin 1872.

Côté, S. D., Rooney, T. P., Tremblay, J. P., Dussault, C., & Waller, D. M. (2004). Ecological impacts of deer overabundance. Annual Review of Ecology, Evolution, and Systematics, 113-147.

Coulson, T., Milner–Gulland, E. J., & Clutton–Brock, T. (2000). The relative roles of density and climatic variation on population dynamics and fecundity rates in three contrasting ungulate species. Proceedings of the Royal Society of London. Series B: Biological Sciences, 267(1454), 1771-1779.

Crabtree, R. L., and J. W. Sheldon. (1999). Coyotes and canid coexistence. In Carnivores in ecosystems: The Yellowstone experience, ed. T. W. Clark et al., 127–163. New Haven: Yale University Press.

Forchhammer, M. C., Stenseth, N. C., Post, E., & Landvatn, R. (1998). Population dynamics of Norwegian red deer: density–dependence and climatic variation. Proceedings of the Royal Society of London. Series B: Biological Sciences, 265(1393), 341-350.

Gipson P.S. (1975). Efficiency of trapping in capturing offending coyotes. Wildlife Management 39, 45-47.

Knowlton F.F., E. M. Gese, Jaeger M.M. (1999). Coyote depredation control: An interface between biology and management. Journal of Range Management 52, 398-412.

Haber, G. C. (1996). Biological, conservation, and ethical implications of exploiting and controlling wolves. Conservation Biology 10:1068-1081.

Linnell J.D.C., Odden J., Smith M.E., Aanes R., Swenson J.E. (1999). Large carnivores that kill livestock: do problem individuals really exist? Wildl Soc Bull 27, 698-705.

Parker, K. L., Barboza, P. S., & Gillingham, M. P. (2009). Nutrition integrates environmental responses of ungulates. Functional Ecology, 23(1), 57-69.

Peebles, K. A., R. B. Wielgus, B. T. Maletzke, And M. E. Swanson. (2013). Effects of remedial sport hunting on cougar complaints and livestock depredations. PloS ONE. DOI: 10.1371/journal.pone.0079713.

Ritchie EG, Elmhagen B, Glen AS, Letnic M, Ludwig G, McDonald RA. (2012). Ecosystem restoration with teeth: what role for predators? In: Trends Ecol. Evol. 27(5):265-271.

Sacks B.N., Blejwas K.M., Jaeger M.M. (1999a). Relative vulnerability of coyotes to removal methods on a northern California ranch. J Wildl Manage 63, 939-949;

Sacks, B. N., M. M. Jaeger, J. C. C. Neale, and D. R. McCullough. (1999). Territoriality and breeding status of coyotes relative to sheep predation. Journal of Wildlife Management 63:593-605.

Sæther, B. E. (1997). Environmental stochasticity and population dynamics of large herbivores: a search for mechanisms. Trends in Ecology & Evolution, 12(4), 143-149.
Smith, M. E., Linnell, J. D., Odden, J., & Swenson, J. E. (2000). Review of methods to reduce livestock depredation II. Aversive conditioning, deterrents and repellents. Acta Agriculturae Scandinavica, Section A-Animal Science, 50(4), 304-315
Stahl P., Vandel J.M. (2001). Factors influencing lynx depredation on sheep in France: Problem individuals and habitat. Carnivore Damage Prevention News 4, 6-8.
Treves A., Naughton-Treves L. (2005). Evaluating lethal control in the management of human-wildlife conflict. pp. 86-106 in R. Woodroffe, S. Thirgood, A. Rabinowitz editors. People and Wildlife, Conflict or Coexistence. Cambridge University Press, Cambridge, UK.
Treves, A., R. L. Jurewicz, L. Naughton-Treves, R. A. Rose, R. C. Willging, and A. P. Wydeven. (2002). Wolf depredation on domestic animals: control and compensation in Wisconsin, 1976-2000. Wildlife Society Bulletin 30:231-241.
Treves, A., K. J. Kapp, And D. Macfarland. (2010). American black bear nuisance complaints and hunter take. Ursus 21:30–42. doi: 10.2192/09gr012.1
Vucetich, J. A., Smith, D. W., & Stahler, D. R. (2005). Influence of harvest, climate and wolf predation on Yellowstone elk, 1961-2004. Oikos, 111(2), 259-270.
Wielgus, R. B. And K. A. Peebles. (2014). Effects of Wolf Mortality on Livestock Depredations. PLoS ONE 9(12): e113505. doi:10.1371/journal.pone.0113505.
Wilmers, C. C., Post, E., Peterson, R. O., & Vucetich, J. A. (2006). Predator disease outbreak modulates top-down, bottom-up and climatic effects on herbivore population dynamics. Ecology Letters, 9(4), 383-389.