LIVE OAK ASSOCIATES, INC.
an Ecological Consulting Firm

April 19, 2012

Senator Ted Lieu
State Capitol
Sacramento CA 95814

SUBJECT: Scientific analysis in support of SB 1221 which will prohibit the use of dogs to pursue black bears and bobcats.

Dear Senator Lieu:

At the behest of The Humane Society of the United States, I have reviewed Senate Bill 1221, which proposes to ban the use of dogs to pursue bear and bobcat in the state of California, and offer this scientific analysis as to the ramifications of this bill.

I write as an expert on the ecology and biology of large mammals (particularly large predators) and as co-founder and Principal of Live Oak Associates, Inc., (LOA), an ecological consulting firm based in California. During the last 35 years, I have conducted a number of studies on mountain lions and have participated in numerous public policy debates as a carnivore expert in western states. I am experienced and versed in management options and conservation strategies for a variety of carnivores, including coyotes, cougar, black bear and the federally endangered San Joaquin kit fox. Most recently I have been using statistically robust spatial tools as a framework for predicting the effects that large perturbations or modifications of landscapes (e.g., several thousand to tens of thousands of acres) have on the suitable habitats and regional landscape connectivity for a suite of carnivore species.

Questions to be addressed

1. Is there a management need to hunt bears or bobcats?
2. Does the use of roaming dogs result in adverse impacts to targeted and non-targeted animals such as bear cubs or bobcat kittens, or other wildlife, particularly protected or sensitive wildlife species?

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EXECUTIVE SUMMARY

While sport-hunting of predators is often touted as a management tool, it rarely is - in essence; we manage for the sport hunt, not by it. Black bear and bobcat hunting programs in California are recreational and do not provide effective means to reduce conflicts between these predators and human interest. There would be no anticipated change in human-predator conflicts if there were reduction in the sport take of bear and bobcat from the prohibition of the use of dogs. Objectives based on recreational opportunities may not be met, but other states (e.g., Oregon and Washington) have found, a shift in the process of issue hunting licenses may accommodate this reduction in harvest. We kill medium and large carnivores through sport take and control efforts (e.g., wildlife services) *not* because hunting has been shown to be an important management tool, but because it is tradition. To argue that hunting is needed for population management is an overly simplistic argument about natural systems - one that is in conflict with both predation theory and evidence.

In all known studies the presence of dogs produced adverse responses in wildlife. Prohibiting the use of dogs for bear and bobcat hunting will have a positive effect on wildlife use of these areas. Any notion that hunting with dogs has no effect on non-target species is naïve and incorrect. Dogs can have rather pronounced affect on numerous species including killing of young of black bears, bobcats and other species including cougar kittens. Off-leash and off-trail hounds are unpredictable and cause stress and flushing behavior in many wildlife species including deer, birds, and small mammals.

Recent studies have attempted to quantify impacts from dogs in open space areas – usually dogs allowed to roam off-leash. Responses of wildlife to human recreational activities (including roaming dogs) include short-term responses that produce measurable physiological responses (e.g., heart rate, stress indicators, hormonal changes, etc.), changes in behavior and activity budgets, and changes in space and habitat-use, not to mention longer-term responses such as lowered reproductive success and productivity, adverse changes in survival and mortality rates, changes in distribution or occupancy rates, and reductions in species richness and species diversity. The unpredictable travel patterns of dogs off-leash extend the zone from which wildlife species are impacted by the presence of dogs. More recent efforts have continued to document the affects that domestic dogs have on a variety of wildlife populations worldwide including as disease vectors, predators and competitors.

BACKGROUND

SB 1221 prohibits the use of dogs to pursue bear and bobcat in California. This bill exempts from this prohibition, "… federal, state, or local law enforcement officers, or their agents, or employees when carrying out official duties as required by law." This legislation was attempted in California in 1993 and again in 2003 and is not a novel concept relating to sport hunting of predators. More than half of the states that currently have a black bear hunting season do not permit the use of dogs in pursuit of bears. Nearby states, including Oregon, Washington and

Montana, prohibit the use of dogs to pursue bears. The rural state of Montana (human population of less than one million) has prohibited the use of dogs to sport hunt bears since 1921 (Mace and Chilton-Radandt 2011).

Bear Distribution and Population Estimates for the State of California
Black bears range across approximately 53,000 mi^2 of habitat in California; primarily within the North Coast, Cascades, Sierra Nevada, and Southern California Mountain ranges. Brown et al. (2009) identified four genetically distinct sub-populations: 1) North Coast/Klamath; 2) Cascade/North Sierra Nevada; 3) Central Sierra Nevada; and 4) Southern Sierra Nevada/Central Coast.

As recently as January 2011, the California Department of Fish and Game (CDFG) estimated that bear populations had steadily increased since 1984 to current statewide population estimates of approximately 36,000 bears in 2009 and upwards of 40,000 in 2010 (DED 2011, Fig. 2).

Inquiries by The Humane Society of the United States as to the measure of uncertainty around each of the estimates in August 2011 prompted CDFG to revise them and provide 95 percent confidence intervals (a metric of uncertainty in the estimate) that had been lacking in previous CDFG reports to the public. The revised estimates tell a very different story.

The point estimate of the population in 1986 of about 16,000 bears jumps to 25,000 in 1987, an improbable population growth spurt in one year. The reason for this most likely is that the 1986 count was an artifact of bias and inconsistency in data collection and a statistical anomaly. Removing this statistical outlier indicates a much slower population growth trend than initially estimated by the state. It is a vastly different story for the bear population to grow from 16,000 to 30,000 (1986 to 2010) or 25,000 to 30,000 (1987 to 2010). The revised estimate results in a relatively flat trajectory for the last decade (approximately 27,500 to 30,000).

It is noteworthy that the 2010 estimate shows a large amount of uncertainty, with estimates ranging from 23,000 to 38,500 bears – a range of more than 15,000 bears. What's more, the state's harvest of bears in 2010 and 2011 were the lowest two harvests in the past two decades. Given such a serious lack of certainty in the state's bear population estimates and two seasons of very low take, management and permitted recreational take of bears should occur very cautiously if at all.

Bobcat Distribution and Abundance
Roberts and Crimmins (2010) summarize the population status and management in North America for the bobcat. They report that California supports about 127,650 mi^2 of habitat with a crude bobcat population estimate around 70,000. The bobcat is a habitat generalist that is widespread in the state.

Is there a management need to hunt bears or bobcats?

Wildlife managers typically manage single species of wild animals to establish sustainable yield and a condition of stasis (that is, stability) -- a goal that is neither achievable nor desirable. This concept -- treating wild animals as a harvestable crop – is inconsistent with modern understanding of population conservation and ecosystem integrity concepts. This is why over the last decade, conservation biologists have tended to shun the North American Conservation Model (the sport hunting paradigm) for predators, in favor of implementing broad conservation measures that preserve and manage functionally intact, interconnected ecosystems (Nelson et al. 2011). Conservation strategies can have as explicit goals the preservation of predators within a functioning ecosystem while simultaneously reducing conflicts with humans, especially where conflicts are taking place between different stakeholders and are more about that than because of anything wild animals might be doing. Predator populations are usually limited by the availability of food resources and the spatial extent and connectedness of the landscape (Roemer et al. 2008); that is, they are largely self-regulating.

The notion that predator populations will grow unabated without human intervention (mortality through sport hunting or culling) is simply unfounded and lacks evidentiary support. In 1972 a blue-ribbon panel of experts produced a report on the state of predator control in North America (Cain et al. 1972). This report assailed the industry of predator control, and pointed out the faulty reasoning behind most (if not all) predator control operations, the lack of science supporting the industry and the failure to actually solve or reduce predator conflicts with humans. They concluded:

> Our recommendations would change the present federal-state cooperative program drastically by concentrating on animals which cause damage, specifically by using non-chemical methods of control which would curtail the attrition against non-target species of ecological and social value. This remarkable program continues unabated in the face of criticism, largely on a basis of unvalidated assumptions (Cain et al. 1972).

This finding notwithstanding, the traditional predator control approaches championed by the those that mistakenly believe predators “must be controlled” and advocated by some wildlife agencies today, still fail to heed this sage advice offered – actually, demanded – by these expert scientists. The traditional approach that relies on management of predators by prophylactic control measures or sport hunting is inconsistent with predation theory or the scientific literature.

Many game agencies and wildlife services engage in management schemes that were assailed by the Cain Report (and more recent analyses) as too costly and ineffective. Furthermore, the attitudes expressed by these agencies fail to recognize that predation is an important and critical ecological process, without which, many systems become unstable. Berger (2006) reported that the massive and expensive control programs (about $1.6 billion in real dollars from 1939 to 1998) aimed at reducing predator populations in and around domestic sheep herds have had little effect on the declining trends in the sheep industry. In fact, Berger found

that the decline of the sheep industry was more closely associated with unfavorable market conditions rather than predator losses.

Intact predator populations serve an important role in maintaining full ecosystem function. For example, researchers in Southern California and elsewhere have found that coyotes serve an important function of maintaining the natural bird diversity (Crooks and Soule 1999). Their research demonstrated that coyotes were effective in reducing predation on native populations of birds by small carnivores thereby resulting in a healthier ecosystem (as defined by higher natural biodiversity). In turn, research in Yellowstone on the reintroduction of the wolf has found that restoring wolves has increased the growth rates of pronghorn populations, since wolves suppress their major predator, the coyote (Berger et al. 2001, Berger et al. 2008).

Taylor (1984) provides clarity in how wildlife management agencies tend to oversimplify the ramifications of predation theory. He argues that the wildlife profession largely relies on relatively short-term predator control studies and that while short-term predator removal may change the stability of the prey population, the average equilibrium density remains relatively unchanged. As of 1985, he was unmoved that the literature provided any evidence that predator removal studies demonstrated any long-term benefit.

A similar conclusion was reached a number of years later by the National Research Council (NRC 1997) for the on-going Alaska predator control and sport hunting effort where they reported "…there is no factual basis for the assumption that a period of intensive control for a few years can result in long-term changes in ungulate population densities."

One of the consistent conclusions of the scientific literature over the last forty years is that efforts to lower carnivore populations to increase ungulate populations or reduce conflicts is not supported by the evidence (Taylor 1984, NRC 1999, Cougar Management Guidelines Working Group 2005). Hurley et al. (2011) provides the most recent example as they unequivocally and succinctly conclude:

> In conclusion, benefits of predator removal appear to be marginal and short term in southeastern Idaho and likely will not appreciably change long-term dynamics of mule deer populations in the intermountain west.

Their findings were based on an experimental control study that removed a significant number of coyote and cougar between 1997-2003 from large areas in Southeastern Idaho.

A good example of how sport hunting is an ineffective tool to reduce conflict with predators can be found in black bears. Garshelis and Noyce (2008) argue that diversity in food resources is an important contributor to stability in bear populations. They caution that poor food years can increase sightings and conflict with bears, giving people the *perception* that bear numbers have increased, when in fact growth rates may have declined. In addition, some nuisance bears (e.g., breaking into cars or homes) are not as vulnerable to hunting as non-nuisance bears – thereby minimizing the effectiveness of hunting in reducing conflicts.

Conflicts with bears are more likely influenced by poor food years and the availability of human foods in or near human habitation. Thus, it is again an unsupported assertion that sport hunting will likely reduce conflicts with bears.

California: a living laboratory

Evidence that dispels the notion that sport hunting is a critical management tool for predators can be found in California in relation to the cougar. Cougars have not been hunted in California since 1971 and California supports the largest amount of high quality cougar habitat in the North America and the greatest number of humans. About 110 to 120 cougars are killed annually in California mostly due to depredation on livestock or pets – a fraction of the kill total for most other smaller Western States (sport take in several of these states exceed 400 to 500 annually). If the assertions that sport hunting were an important "tool" one would assume that California would have substantially greater human-cougar conflict when compared with other western states that support aggressive sport hunt seasons. Yet when normalized for the size of the cougar and human population in each state and western Canadian province, California does not rank 1st, but ranks 11th. In other words, the risk of an attack by a cougar is greater in ten other Canadian provinces and western states.

Additionally, California supports about five million cattle and nearly a million sheep (more than all of western states except Texas), and yet the absolute number of depredation incidences places it about in the middle. If we consider depredation rate, California would rank near the bottom, as it does with attacks on humans. This completely contradicts the argument that sport hunting or predator control is a valuable and necessary management tool. This extensive analysis of attack statistics across North America has caused me to conclude that the intensity of sport-hunting cougars is not at all correlated with a concomitant change in the risk to humans.

Research from Northeastern Washington has found that increased killing of cougars, while it has reduced the cougar population, has resulted in increasing conflicts with humans, as younger male cougars, which become more prevalent in hunted populations, are more prone to prey on livestock than older male and female cougars (Lambert et al. 2006, Robinson et al. 2008).

Conclusion on the importance and need of sport hunting to "manage" predators

While sport-hunting of predators is often touted as a management tool, it rarely is - in essence; we manage for the sport hunt, not by it. Black bear and bobcat hunting programs in California are recreational and do not provide effective means to reduce conflicts between these predators and human interest.

The use of dogs accounted for 46.5 percent of the bears taken by sport hunting between 2005 and 2010 and 13.3 percent of the bobcats taken during the 2005-2006 and 2010-2011 seasons. There would be no anticipated change in human-predator conflicts if there were reduction in the sport take of bear and bobcat from the prohibition of the use of dogs. Objectives based on

recreational opportunities may not be met, but other states (e.g., Oregon and Washington) have found, a shift in the process of issue hunting licenses may accommodate this reduction in harvest.

We kill medium and large carnivores through sport take and control efforts (e.g., wildlife services) not because hunting has been shown to be an important management tool, but because it is tradition. To argue that hunting is needed for population management is an overly simplistic argument about natural systems - one that is in conflict with both predation theory and evidence. Taylor (1984), NRC (1997) and Hurley et al. (2011) certainly provide some rather sobering analysis that short-term predator control studies are extremely costly and they provide no real evidence of any long-term benefit for minimizing conflicts or increasing prey populations.

Many state and federal game managers expend considerable energy ignoring the best available science that clearly demonstrates efforts to manage predators by broad lethal efforts (e.g., sport hunting and prophylactic lethal control) fails. We have failed to heed the sound evidence-based recommendations of the scientific literature, as was part of the Cain Report and have not shifted our focus away from costly and ineffective predator control programs or sport hunting programs to efforts that focus on removing the offending predator. Policymakers find themselves unwilling to move from severely failed management schemes to more cost-effective and ecologically relevant ones.

Does the use of roaming dogs result in adverse impacts to targeted and non-targeted animals such as bear cubs or bobcat kittens, or other wildlife, particularly protected or sensitive wildlife species?

In all known studies the presence of dogs produced adverse responses in wildlife. Prohibiting the use of dogs for bear and bobcat hunting will have a positive effect on wildlife use of these areas. Any notion that hunting with dogs has no effect on non-target species is naïve and incorrect. Dogs can have rather pronounced affect on numerous species including killing of young of black bears, bobcats and other species including cougar kittens. Off-leash and off-trail hounds are unpredictable and cause stress and flushing behavior in many wildlife species including deer, birds, and small mammals.

I studied the cougar population in the Diablo Range (the hills east of San Jose) from 1978 to 1990, where I radio-tagged 30 individuals utilizing the services of experienced houndsmen during this time (Hopkins et al. 1986, Hopkins 1990, Grigione et al. 2002). This experience, along with that of my colleagues around the west, reveals that dogs clearly induce stress in the individual animal they are pursing; they may trap the predator on the ground and either the target individual and/or dogs are injured or killed; they may kill young animals if trapped on the ground (cougar, bobcat kittens or bear cubs, etc.); they dangerously frighten and harass ungulates or kill them or their fawns outright; and they induce stress in any number of other wildlife species, some of which are highly sensitive such as the Sierra Nevada red fox and other

forest carnivores. I personally observed one deer flush from cover and break a leg jumping over a large downed tree.

The degree to which the use of dogs to pursue predators adversely affects non-target individuals clearly needs more study. Incidences either are undetected by the owner of the dogs or go unreported. True, wildlife researchers themselves use experienced houndsmen in the course of research, but even under the most controlled and exhaustive protocols, albeit at low levels, they encounter problems. The risks of recreational use are likely to be exponentially higher.

Arguments to the contrary have been made, of course. The Maine Department of Inland Fisheries and Wildlife (2012) speculated that the use of dogs to pursue bears had minimal impacts to non-target species; they do so however, without referencing any evidence to support their position. As discussed below, this is an uninformed and unsupported position when taken in context of the available data.

Harlow et al. (1992) provides one of the few studies to actual test the stress level in a target animal being pursued by dogs. Researchers in Utah captured five cougars and administered adrenal response tests to them. Three cougars were selected to be chased and additional six or seven times and two were treated as the control group. Cougars that were chased multiple times responded physiologically to the stress of the chase by a depression in adrenal response. These authors concluded that while the ramifications of such a response were unknown, they would warrant further study and that "…frequent pursuit could result in potentially deleterious physiological changes…"

There has been a growing interest over the last twenty years to study anthropogenic effects of human activity on wildlife populations. Recent studies have attempted to quantify impacts from dogs in open space areas – usually dogs allowed to roam off-leash. Responses of wildlife to human recreational activities (including roaming dogs) include short-term responses that produce measurable physiological responses (e.g., heart rate, stress indicators, hormonal changes, etc.), changes in behavior and activity budgets, and changes in space and habitat-use, not to mention longer-term responses such as lowered reproductive success and productivity, adverse changes in survival and mortality rates, changes in distribution or occupancy rates, and reductions in species richness and species diversity (Steidl and Powell 2006).

Sime and Kalispell (1999) review the literature as it relates to impacts to wildlife from domestic dogs. They report that a number of researchers have observed that individuals on foot may solicit a greater flight response from wildlife species such as deer then snowmobiles, due to an "unanticipated disturbance". Sime and Kalispell hypothesize that dogs act as an unanticipated disturbance, thereby resulting in more detrimental response. These authors also note that dog feces have also been implicated in the transmission of muscle cyst (*Sarcocystis* spp.) that can infect a variety of wildlife species including elk and mule deer. Dogs potentially transmit other diseases such as Leptospirosis (Sime and Kalispell (1999).

Sweeney et al. (1971) and Corbett et al. (1971) studied the effects that hunting hounds had on white-tailed deer in southeastern coastal plains and mountainous terrain in western North Carolina, respectively. These authors found that chases lasted an average of 33 and 54 minutes and in 70% of the time deer were chased out of their home range, taking more than a day to return in most cases. The deer in the mountainous terrain suffered more injury due to the complexity of the topography. They also documented dog-related mortality. These authors concluded that dogs "…may have a significant impact on populations."

Researchers in Colorado tested whether or not off-leash dogs would adversely affect various wildlife species in the Open Space and Mountain Parks above Boulder, CO. They found that the presence of dogs correlated with altered patterns of habitat utilization for mule deer, small mammals, prairie dogs and bobcats (Lenth et al. 2005, 2006, 2008). More importantly, the unpredictable travel patterns of dogs off-leash extend the zone from which wildlife species are impacted by the presence of dogs. For example, deer are more likely to flush when dogs leave trails, and wander unpredictably off trail.

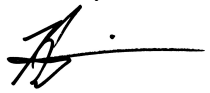
More recent efforts have continued to document the affects that domestic dogs have on a variety of wildlife populations worldwide including as disease vectors, predators and competitors (Reed and Merendlender 2011, Young et al. 2011).

Grignolio et al. (2010) found that hounds used to hunt wild boar and hare adversely affected non-target roe deer by resulting in shifts in spatial behavior (e.g., larger home ranges and higher use of protected areas or reserves). Home ranges outside reserve areas were five times that of home ranges within reserves. These authors noted that roe deer selected, safe, but suboptimal habitat. Deer would concentrate into the preserve area during the hunting season resulting in increased impact from browsing.

Koster (2008) studied the affects that hunting with dogs has on faunal biodiversity in Nicaragua, reporting that a number of species (e.g., agoutis, pacas, nine-banned armadillos, collared peccaries and tapirs) were vulnerable to hunting with dogs (e.g., the harvest of these species can be too great) and the dogs indiscriminately pursued non-target species. One of the non-target species encountered was the jaguar; another, the ocelot, led to one being killed.

If you have any questions regarding my analysis, please contact me at your earliest convenience.

Sincerely,



Rick A. Hopkins, Ph.D.
Principal and Senior Conservation Biologist

LITERATURE CITED

Berger, J., P. B. Stacey, L. Bellis, M.P. Johnson. 2001. A mammalian predator-prey imbalance: Grizzly bear and wolf extinction affect avian Neotropical migrants. Ecological Applications 11:947-960.

Berger, K. M., E., M. Gese, J. Berger. 2008. Indirect effects and traditional trophic cascades: A test involving wolves, coyotes, and pronghorn. Ecology 89:818-828.

Berger, K. M. 2006. Carnivore-livestock conflicts: Effects of subsidized predator control and economic correlates on the sheep industry. Conservation Biology, 20(3):751-761.

Brown, S. K., J. M Hull, D. R. Updike, S. R. Fain, and H. B. Ernest. 2009. Black bear population genetics in California: Signatures of population structure, competitive release, and historical translocation. Journal of Mammalogy, 90(5):1066-1074.

Cain, S. C., J. A. Kadlec, D. L. Allen, R. A. Cooley, M. G. Hornocker, A. S. Leopold, and F. H. Wagner. 1972. Predator Control – 1971 Report. Council on Environmental Quality and the Department of the Interior, Advisory Committee on Predator Control, Washington D.C.

California Department of Fish and Game Wildlife Branch. 2010. Bear Take Report. The Natural Resources Agency.

California Department of Fish and Game. 2011. Draft Environmental Document Sections 365, 366, 367.5, 401, 708, Title 14, California Code of Regulations Regarding Bear Hunting. The Natural Resources Agency. i-A53pp.

Corbett, R. L., L. Marchinto, and C.E. Hill. 1971. Preliminary study of the effects of dogs on radio-equipped deer in mountainous habitat. Proceedings of the Southeastern Association of Game and Fish Commissioners 25:69-77.

Cougar Management Guidelines Working Group. 2005. Cougar Management Guidelines. WildFutures, Bainbridge Island, Washington.

Crooks, K.R. and M. E. Soule. 1999. Mesopredator release and avifaunal extinctions in a fragmented system. Nature 400:563-566.

Dobey, S., D. V. Masters, B. K. Scheick, J. D. Clark, M. R. Pelton, and M. E. Sunquist. 2005. Ecology of Florida black bears in the Okefenokee-Osceola ecosystem. Wildlife Monographs 158:1-41.

Garshelis, D. L. and K.V. Noyce. 2008. Seeing the world through the nose of a bear – diversity of foods fosters behavioral and demographic stability. Eds, T. E. Fulbright and D. G. Hewitt,

pages 139 to 163 in Wildlife Science: Linking Ecological Theory and Management Applications. CRC Press. NY

Grigione, M.M., P. Beier, R.A. Hopkins, D. Neal, W.D. Padley, C.M. Schonewald and M. L. Johnson. 2002. Ecological and allometric determinants of home-range size for mountain lions (Puma concolor). Animal Conservation 5:317-324.

Grignolio, S., E. Merli, P. Bongi, S. Ciuti, M. Apollonio. 2010. Effects of hunting with hounds on a non-target species living on the edge of a protected area. Biological Conservation, 144(2011):641-649.

Harlow, H. J., F. G. Lindzey, W. D. Van Sickle, and W. A. Gern. 1992. Stress response of cougars to nonlethal pursuit by hunters. Canadian Journal of Zoology, 70:136-139.

Hopkins, R. A., M. J. Kutilek, and G. L. Shreve. 1986. The density and home range characteristics of mountain lions in the Diablo Range of California. Pages 223-235 In S. D. Miller and D. Everett eds, Proc. International Cat symposium, Kingsville, Texas, October 1982.

Hopkins, R.A. 1990. Ecology of the Puma in the Diablo Range. Ph.D. Dissertation University of California at Berkeley, California.

Hurley, M. A., J. W. Unsworth, P. Zager, M. Hebblewhite, E. O. Garton, D. M. Montgomery, J. R. Skalski, C. L. Maycock. 2011. Demographic response to mule deer to experimental reduction of coyotes and mountain lions in southeastern Idaho. Wildlife Monographs 178:1-33.

Koster, J. 2008. The impact of hunting with dogs on wildlife harvests in the Bosawas Reserve, Nicaragua. Environmental Conservation, 35(3):211-220.

Lambert, C. M. S., R. B. Wielgus, H. S. Robinson, D. D. Katnik, H. S. Cruickshank, R. Clarke, and J. Almack. 2006. Cougar population dynamics and viability in the Pacific Northwest. Journal of Wildlife Management 70(1):246-254.

Lenth, B., M. Brennan, and R. L. Knight. 2006. The effects of dogs on wildlife communities. Final research report submitted to: City of Boulder Open Space and Mountain Parks. 1-29pp.

Lenth, B. and R. L. Knight. 2005. The effects of dogs on wildlife communities. Year-end report, 2004. Submitted to: City of Boulder Open Space and Mountain Parks. 1-9pp.

Lenth B. E., R. L. Knight, and M. E. Brennan. 2008. The effects of dogs on the wildlife communities. Natural Areas Journal, 28(3):218-227.

Mace, R.D., and Tonya Chilton-Radandt. 2011. Black Bear Harvest Research and Management in Montana: 2011 Final Report. Montana Fish, Wildlife & Parks. Federal Aid in Wildlife Restoration Project W-154-R.

Maine Department of Inland Fisheries and Wildlife. 2012. Frequently asked questions concerning baiting and the use of hounds to hunt bears.

Nelson, Michael P., John A. Vucetich, Paul C. Paquet, and Joseph K. Bump. 2011. An inadequate construct? *The Wildlife Professional* 5, no. 2: 58-60.

NRC 1997: Wolves, Bears, and Their Prey in Alaska: Biological and Social Changes in Wildlife Management. Committee on Management of Wolf and Bear Populations in Alaska, Board on Biology, National Research Council, National Academy Press, Washington, D.C.

Reed, S. E. and A. M. Merenlender. 2011. Effects of management of domestic dogs and recreation on carnivores in protected areas in northern California. Conservation Biology, 25(3):504-513.

Roberts, N. M. and S. M. Crimmins. 2010. Bobcat population status and management in North America: Evidence of large-scale population increase. Journal of Fish and Wildlife Management, 1(2):169-174.

Robinson, H. S, R. B. Wielgus, H. S. Cooley, and S. W. Cooley. 2008. Sink populations in carnivore management: Cougar demography and immigration in hunted population. Ecological Applications, 18(4):1028-1037.

Roemer, G. W., M. E. Gompper, and B. Van Valkenburgh. 2008. The ecological role of the mammalian mesocarnivore. BioScience: 59:165-173.

Sime, C. A. 1999. Domestic dogs in wildlife habitats. Pages 8.1-8.7 in G. Joslin and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: A review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society. 307pp.

Steidl, R. J., and B. F. Powell. 2006. Assessing the effects of human activities on wildlife. The George Wright Forum 23 (2):50-58.

Sweeney, J.R. R. L. Marchinton, and J. M. Sweeney. 1971. Responses of radio monitored white-tailed deer chased by hunting dogs. Journal of Wildlife Management 35:707-716.

Taylor, R. J. 1984. Predation. Population and Community Biology. Chapman and Hall, NY

Young, J. K., K. A. Olson, R. P. Reading, S. Amgalanbaatar, and J. Berger. 2011. Is wildlife going to the dogs? Impacts of feral and free-roaming dogs on wildlife populations. BioScience, 61(2):125-132.