



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

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May 4, 2016

Kellye Pinkleton
Arizona State Director
The Humane Society of the United States
2100 L Street, NW
Washington, DC 20037

Dear Director Pinkleton,

We have reviewed your letter dated April 7, 2016, and would like to provide you with context to our responsibilities and feedback on your comments.

The Arizona Game and Fish Department (Department) is responsible for managing more than 800 species of Arizona's unique native wildlife. This includes threatened and endangered species, as well as more common species. The Department's management responsibilities include predator species as well as their prey, and we value predators as an essential component of Arizona's wildlife community. All species are managed using the best available science to ensure sustainable populations for current and future generations and only those species and populations that can sustain managed removal of individuals are hunted and/or harvested. The authority for the Department to conserve wildlife is mandated through Arizona Revised Statute (Title 17), and we take that responsibility seriously.

Throughout North America, state and provincial wildlife agencies actively manage resident, migratory and imperiled wildlife populations. In many cases conservation requires active management actions. Wildlife populations and the habitat that they rely on have been adversely impacted by habitat fragmentation and degradation, introduction of invasive species and diseases, altered fire regimes, extended drought and drying of natural water sources. In this modified landscape, some natural processes such as migrations, recolonizations, and predator-prey relationships are disrupted, requiring active management to maintain biotic diversity.

For example, for over six decades, managers have recognized the need to compensate for fragmented habitats by using translocations as a tool to enhance or restore extirpated bighorn sheep populations. Although bighorn sheep have been documented to move across large areas of low habitat suitability, the frequency at which these dispersals occur has diminished, largely due to habitat fragmentation through development, highways and utility infrastructure (Bleich et al. 1990, 1996). In Arizona, only four game management units are known to have bighorn sheep populations that were naturally colonized, while nine more have populations that were re-established through active translocation efforts (AZGFD, unpublished data). Because of these

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efforts, Arizona's bighorn sheep population has recovered from as few as 1,000 to approximately 6,000 today. While Arizona has many native populations of bighorn sheep, there are multiple areas of vacant historical habitat which would benefit from the reintroduction of this species. Because the probability of these areas being colonized naturally has diminished, active management is required to offset other human impacts. The need for similar active management in the face of degraded ecosystems has also been recognized for other species. Scott et al. (2005) termed such species as "conservation-reliant," and suggested that the number of species requiring continued active management will only increase.

Mountain lions and bighorn sheep are both native species that have shared a long history in the Southwest and most of western North America. Their predator-prey relationship dates back thousands of years and, although deer are typically recognized as the primary prey of mountain lions, bighorn sheep are also a key prey species (Anderson 1983, Hayes et al. 2000, Sawyer and Lindzey 2002, Murphy and Ruth 2010). The Department recognizes that mountain lions are a part of the natural ecosystem that bighorn sheep live in, and that both these iconic species should be on the landscape. However, mountain lion predation has been identified as a leading cause of mortality in some bighorn sheep populations, and multiple studies suggest that mountain lion predation may cause small populations to be extirpated (Wehausen 1996, Hayes et al 2000, Logan and Sweanor 2001, Kamler et al 2002, Sawyer and Lindzey 2002).

The Department has carefully considered the need for predation management, and has developed a data-based approach to maximize benefits to bighorn sheep while minimizing administrative removal of mountain lions.

Most importantly, the Department employs selective removal of mountain lions rather than a blanket removal of mountain lions in an area, an approach supported by the best available science (Logan and Sweanor 2001, Ernest et al 2002). A number of studies have shown that there are individual differences among mountain lions, and that some mountain lions living in sympatry with bighorn sheep may kill bighorn sheep on multiple occasions while other mountain lions in the same area do not. For example, Ross et al. (1997) found that of the five mountain lions intensively monitored during their study, two mountain lions were never known to kill a bighorn sheep, one mountain lion was documented to kill only one bighorn sheep, while another mountain lion living in the same area killed 17 bighorn sheep. Similarly, Ernest et al. (2002) found that a small number of mountain lions killed a disproportionate number of bighorn sheep while other mountain lions in the same area were not associated with repeated bighorn sheep kills. In addition, several researchers have concluded, based on field studies, that mountain lion predation rates on bighorn sheep are not clearly tied to (or a function of) the size of the lion population, but rather a function of the behavior of individual mountain lions (Hoban 1990, Ross et al. 1997, Logan and Sweanor 2001, Sawyer and Lindzey 2002). Because a single mountain lion may kill, on average, one big game animal per week (Anderson and Lindzey 2003), even a small number of mountain lions with a preference for bighorn sheep can pose a high risk to a small bighorn sheep population.

Identification and removal of individual mountain lions targeting bighorn sheep as prey is the most effective method for minimizing mountain lion predation on the population (Sawyer and Lindzey 2002, Ernest et al. 2002). The Department has adopted this approach to benefit at-risk

bighorn sheep populations while minimizing the administrative removal of mountain lions. This has been our strategy in the Catalina Mountains Bighorn Sheep Reintroduction Project, where we have removed seven lions that were identified as having preyed on bighorn sheep. The Department only implements the administrative removal of mountain lions to protect prey populations in limited and specific situations. In all cases, implementation of administrative mountain lion removal is accompanied by a management plan that determines when to cease mountain lion removal, either based on a time period or when the specific prey population reaches a sustainable threshold.

As mentioned, the Department manages more than 800 species and advocates that wildlife populations need to be managed in balance with their environment. This environment includes habitat, other wildlife populations and predator-prey relationships. The Department implements the administrative removal of predators to benefit other select species. Targeted predator removal is an essential tool in the recovery of multiple rare, threatened, and/or endangered species such as black-footed ferrets, prairie dogs, Chiricahua leopard frogs, relict leopard frogs, and Sonoran mud turtles. In addition, the Department annually spends millions of dollars on habitat improvements and works closely with land management agencies to enhance habitats to benefit Arizona's wildlife. However, active management is sometimes required to mitigate long-term impacts of human influences on the landscape. For example, Festa-Bianchet et al. (2006) suggest that predator-prey equilibria may only occur at large geographical and temporal scales and are less likely with increasing habitat fragmentation. Managers must consider these dynamics and make decisions that simultaneously manage mountain lion populations for their intrinsic and ecological value, while also ensuring sustainability of the prey populations.

Because bighorn sheep have a low rate of increase compared to other ungulates such as deer (Buechner 1960, Geist 1971), predation by mountain lions may need to be managed at times to ensure the recovery and sustainability of prey populations, particularly when dispersal opportunities are diminished by habitat fragmentation. As part of the Department's proactive, adaptive management process, we want to assure that predation by individual mountain lions does not cause the failure of our bighorn sheep restoration efforts.

In your letter you made several statements and assertions that require clarification and correction:

1. The letter states "*While we do not have the forensic evidence before us, mountain lions are capable of scavenging animals (Bauer et al. 2005) such as bighorn sheep, who have succumbed to death by other means, including from disease or starvation.*", suggesting that the mountain lion killed on March 18, 2016 may have scavenged the bighorn sheep carcass. Department biologists carefully investigated this mortality and determined definitively that this bighorn sheep had been killed by a mountain lion.
2. You refer to the mountain lion removed March 18, 2016 as a kitten, and suggest that removal of this mountain lion was not in accordance with Department policies. Specifically, your letter stated "*Additionally, the AZGFD mountain lion hunting guidelines prohibit the take of spotted kittens and female mountain lions with spotted kittens (AZGFD 2015). Young lions typically retain visible spots throughout*

their first year of life (Hansen 1992). As a member of the Advisory Committee, AZGFD should recognize and uphold the principles of the Committee regarding the killing of female mountain lions and their kittens.” The mountain lion that was pursued and killed on March 18, 2016 was an unspotted mountain lion. As per regulation, and the active Santa Catalina Adaptive Mountain Lion Management Plan, the Department does not remove spotted kittens or female mountain lions accompanied by spotted kittens. Removal of this mountain lion did not conflict with Department policies or state law.

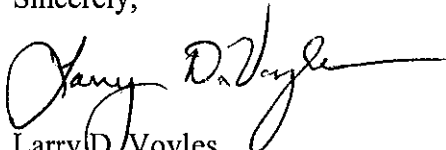
3. Your letter suggested that unregulated market hunting and trophy hunting are causing bighorn sheep population declines. Specifically it stated that “*Bighorn sheep populations are in decline in the U.S. because of unregulated market hunting, trophy hunting, disease from domestic sheep,³ resource competition by livestock, and loss of habitat (Warren 1997, Logan and Sweanor 2001, Lomax 2008, Murphy and Ruth 2010, Monteith et al. 2013).*” This statement in your letter is not supported in our review of the documents you referenced. The literature cited for this statement does not provide any peer-reviewed evidence that bighorn sheep populations are declining as a result of hunting. In fact, several of the sources don’t even address changes in bighorn sheep population size. Bighorn sheep populations in Arizona have increased from approximately 1,000 in 1957 to more than 6,000 today, a direct result of hunters’ contributions through the conservation dollars they generate and the personal time and effort they expend on habitat improvements for bighorn sheep conservation. One of the founding principles for the North American Model of Wildlife Management is the prohibition on commerce of dead wildlife. Commercial hunting and the sale of wildlife is prohibited to ensure the sustainability of wildlife populations. Nationally, market hunting in the United States is illegal, and has been for more than a century. While a number of factors currently threaten bighorn sheep populations in the United States, hunting is not one of them. In fact, hunting of bighorn sheep in Arizona is very carefully regulated and only includes limited hunting of rams. In addition, revenue generated through these carefully managed hunts is used to benefit bighorn sheep populations, through actions such as habitat improvements and translocations.
4. Your letter makes a recommendation about areas that the Department should avoid when translocating bighorn sheep, specifically stating “*In future, when the AZDGF makes a decision about where to re-release bighorn sheep, it should avoid areas that contain cliffs, rocks, and foliage that makes excellent ambush cover for mountain lions (McKinney et al. 2006a).*” Science demonstrates that these characteristics are, in fact, the habitat attributes that define bighorn sheep habitat. It is well-known that bighorn sheep distribution is associated with steep and rugged terrain, where sheep are better able to evade their predators, and that they rely on the presence of available vegetation to survive (Hansen 1980, Shackleton 1985, Risenhoover and Bailey 1985). Therefore, avoiding areas that contain cliffs, rocks, and foliage would eliminate the best areas suitable for bighorn sheep, and would be in complete contrast to bighorn sheep management that has successfully recovered their populations in multiple mountain ranges.

5. You stated that *“Arizona's trophy hunting season on mountain lions could indirectly contribute to bighorn sheep predation due to a year-round season and multiple bag limits.”* We do not have a trophy season on mountain lions, or any other species of wildlife in Arizona. Your claim is not defensible based on modern science (e.g., Cooley et al. 2009) and the current hunting practices in Arizona. You cited a study by Keehner et al. (2015) as support for the contention that Arizona’s mountain lion harvest could contribute to bighorn sheep predation. However, conclusions in this citation are not relevant to our situation as the study focused on male mountain lion harvest only and Arizona allows hunting of both sexes. In addition, Keehner et al. (2015) did not test the alternate hypothesis that female mountain lions seasonally select different habitats and prey sources for reasons unrelated to avoidance of males (Murphy and Ruth 2010). The published literature is inconclusive on the effect of hunting on mountain lion population dynamics (e.g., Cooley et al. 2009), let alone the resulting indirect effects on prey populations.

6. Finally, you stated that *“Arizona could see better success with protecting bighorn sheep populations by leaving mountain lions alone who are not preying on bighorn sheep (Murphy and Ruth 2010, Keehner et al. 2015).”* We agree on this point, and hopefully this letter has clarified that the administrative removal of mountain lions only targets those mountain lions that have preyed on bighorn sheep.

Conservation is never quick, seldom easy and often a difficult process that requires active management strategies. Repatriation is both a standard and successful practice in conserving wildlife for future generations to enjoy. Examples where the Department has translocated animals into vacant habitats with success include black footed ferrets, Sonoran pronghorn and Mexican wolf, to mention a few. These efforts are conservation driven and not fueled by hunter interests, although sportsmen have participated in the funding and the on-the-ground habitat work. The Department and many other state wildlife agencies have successfully reintroduced bighorn sheep to numerous mountain ranges where they had been extirpated, and it is our hope that they will also become successfully reintroduced to the Catalina Mountains. Arizona has a healthy mountain lion population, with mountain lions present in suitable habitat throughout Arizona. The Department’s long-term goal is to maintain viable populations of both species on the landscape.

Sincerely,


Larry D. Voyles
Director

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**THE HUMANE SOCIETY
OF THE UNITED STATES**

April 7, 2016

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Larry D. Voyles, Director
Arizona Game and Fish Dept.
5000 W. Carefree Hwy.
Phoenix, AZ 85086
Phone: (623)236-7278
Email: lvoyles@azgfd.gov

Catalina Bighorn Advisory Committee
Attn: Mark Hart
Public Information Officer
Arizona Game and Fish Dept.
555 N. Greasewood Rd.
Tucson, AZ 85745
Phone: (520) 628-5376
Email: mhart@azgfd.gov

**RE: Killing a Dependent Mountain Lion Kitten on the Catalina Bighorn Sheep
Restoration Project**

Dear Director Voyles and Members of the Catalina Bighorn Advisory Committee:

On behalf of The Humane Society of the United States (The HSUS) and our supporters in Arizona, I write in regards to the recent killing of a dependent mountain lion kitten by Arizona Game and Fish Department (AZGFD) officers in the Catalina Mountains.

On March 18th, AZGFD discovered the carcass of Ewe #37454 and suggested that the bighorn sheep's death was caused by a mountain lion. A young lion, estimated to be between nine and twelve months of age, was killed by AZGFD. A female and second young lion, likely the kitten's mother and sibling, were also pursued but not found. While we do not have the forensic evidence before us, mountain lions are capable of scavenging animals (Bauer et al. 2005) such as bighorn sheep, who have succumbed to death by other means, including from disease or starvation.

We request the the AZGFD and the Catalina Bighorn Advisory Committee (Advisory Committee) review its policies to prevent future killing of young mountain lions or their mothers for bighorn sheep predation.

I. Killing young mountain lions and their mothers is against sound science: In new research, biologists suggest that kittens up to 12 months of age are likely

incapable of dispatching prey animals on their own (Elbroch and Quigley 2012).¹ It is unlikely that a nine-to-twelve month mountain lion could survive on its own, much less take down large prey (Hansen 1992, Elbroch and Quigley 2012).

The Advisory Committee has acknowledged and endorsed the need to not kill females with dependent kittens.² The death of an adult female mountain lion leaves her dependent, orphaned lions to suffer an agonizing death by dehydration, starvation predation or exposure (Stoner et al. 2006). Additionally, the AZGFD mountain lion hunting guidelines prohibit the take of spotted kittens and female mountain lions with spotted kittens (AZGFD 2015). Young lions typically retain visible spots throughout their first year of life (Hansen 1992). As a member of the Advisory Committee, AZGFD should recognize and uphold the principles of the Committee regarding the killing of female mountain lions and their kittens.

II. Killing Arizona mountain lions will not enhance bighorn sheep populations: The AZGFD's strategy to kill mountain lions for taking Catalina bighorn sheep is not informed by the best available science concerning the causes of bighorn sheep decline and predation. Bighorn sheep populations are in decline in the U.S. because of unregulated market hunting, trophy hunting, disease from domestic sheep,³ resource competition by livestock, and loss of habitat (Warren 1997, Logan and Sweanor 2001, Lomax 2008, Murphy and Ruth 2010, Monteith et al. 2013). AZGFD can better protect this bighorn sheep population by removing some vegetation that provides stalking cover for mountain lions (McKinney et al. 2006b, Murphy and Ruth 2010). In future, when the AZDGF makes a decision about where to re-release bighorn sheep, it should avoid areas that contain cliffs, rocks, and foliage that makes excellent ambush cover for mountain lions (McKinney et al. 2006a).

III. Arizona's mountain lion-hunting policies contribute to BHS predation: Arizona's trophy hunting season on mountain lions could indirectly contribute to bighorn sheep predation due to a year-round season and multiple bag limits.

When a dominant male lion is removed, the mountain lion density into an area can increase due to migration from multiple subadult males (Lambert et al. 2006, Stoner et al. 2006, Robinson et al. 2008, Ruth and Murphy 2010). Females with kittens avoid these infanticidal subadult males by moving to higher elevations, and prey switching from abundant, primary prey in lower elevations to rare, sensitive and threatened secondary prey at higher elevations (Keehner et al. 2015). Arizona could see better success with protecting bighorn sheep populations by leaving mountain lions alone who are not preying on bighorn sheep (Murphy and Ruth 2010, Keehner et al. 2015).

¹ Also, please view the BBC documentary, *Cougars Undercover*, which supports the notion that kittens are incapable of dispatching prey as the filmmakers and Panthera follow the lives of two orphaned kittens: <http://voices.nationalgeographic.com/2015/12/01/natgeo-wilds-big-cat-week-cougars-undercover/>.

² "If a female with young kittens is the predator that takes a bighorn sheep, we will not take that animal," Catalina Bighorn Advisory Committee website. Frequently Asked Questions. <http://www.catalinabighornrestoration.org/FAQs.html>

³ "Severe pneumonia outbreak kills bighorn sheep: Lamb survival to be closely monitored for several years" <http://www.ayma.org/onlnews/ayma/may10/100501c.asp>, Recognizing the problems of disease transmission from domestic sheep and their wild cousins, the BLM last month issued a policy to guide better protections for bighorns: http://www.blm.gov/wa/st/en/info/newsroom/2016/march/nr_03_11_2016a.html.

We respectfully request that the the AZDGF review its policies on mountain lions and bighorn sheep to avoid future unfortunate events, and to better protect both species. We would also like the opportunity to discuss this in greater detail at your convenience. I can be reached at kpinkleton@humanesociety.org.

Thank you,

A handwritten signature in black ink, appearing to read "Kellye A. Pinkleton". The signature is fluid and cursive, with a long horizontal stroke at the end.

Kellye Pinkleton
Arizona State Director
The Humane Society of the United States

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