December 12, 2023

Via Email

Washington Fish and Wildlife Commission
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Dear Commissioners:

As experts in carnivore ecology, we write to describe scientific conclusions and consensus about issues related to cougar and bear management. We hope that sharing our understanding of this science will help the Commission weigh its decision on the rulemaking petition filed on October 25, 2023, asking for setting guidelines and limits on cougar and bear hunting based on the scientific consensus of scientists in the field.

COUGARS

Healthy cougar populations help create healthy ecosystems. Cougars are a keystone species that play a central role in U.S. ecosystems, with more documented ecological interactions between cougars and other species than for any other carnivore in the world.[4,28,32,43,44] Your management decisions about cougars thus have extensive cascading effects.[32]

Overhunting destabilizes cougar populations

Cougars do not require hunting to regulate their populations.[22,46,49] Where they are hunted, hunting needs to be managed carefully to avoid excessive mortality, which will decrease genetic diversity in the broader population,[37,76] disrupt and destabilize social structures,[7,17,20,29,51,52,59,60,64,74] and increase the risk of human-cougar conflicts.[7,12,16,25,30,41,46,48,66,67] Overexploitation of cougars in local areas may impact the larger population, because male cougars disperse over long distances to colonize vacant territories.[7,61,65]

Killing too many cougars in a local area creates a "sink" population that attracts immigrants from other areas and can have an impact on the broader population.[7,52,61] When older male cougars are killed, young male cougars rapidly move into those vacated territories. This influx of increase in male cougars may mask declines in the female cougar population and a decrease in kitten survival, both of which may have significant population-wide consequences.[61,74] More female cougars are also killed in areas of high mortality, but because female cougars are less likely to disperse, the female population will not be quickly replaced by new female immigrants.[50,74] In addition, hunters also kill more kittens in overexploited sink areas, because it is difficult for hunters to accurately age cougars in the field.[22] In addition, higher mortality due to hunting and management actions will orphan more kittens, since cougar kittens often do not travel with their mothers and thus cannot be seen by hunters.[22] At the same time, high turnover within the male cougar population increases infanticide, as males are known to kill unrelated kittens to induce estrous in females, so that they can breed with them.[20,64,74]

Research throughout the western U.S. has shown that cougar predation generally does not cause declines in ungulate populations.[33,47] Other factors such as loss of habitat, disease, wildfire, rainfall levels (especially during the growing season), maternal health, and winter severity are greater predictors of recruitment and survival in ungulate herds.[33,46] Predator removal actions do not address these environmental factors and thus research has shown that predator-removal actions generally have no long-term impact on ungulate populations.[33,47] [*]

WDFW has done groundbreaking research on cougar population densities and growth rates

Because of their low population densities and secretive nature, it is expensive and time-consuming to conduct accurate cougar population surveys. However, biologists at the Washington Department of Fish and Wildlife have performed some of the most comprehensive cougar surveys of any state, informing management for mountain lions nationwide.[19,38,55,57,68]

This work revealed an average state density of 2.2 independent-age cougars[†] per 100 km^2.[9] Although local cougar population estimates extrapolated from the statewide average density are not exact, the research indicates that significant density disparities in local areas are unlikely. WDFW's research also found that the intrinsic growth rate for the state's cougar population is 14% (with a margin of error of +/- 2%).[74] This estimate was verified by work across multiple fieldwork areas and is widely cited and accepted by other scholars.[‡] This estimate also is in line with the findings of comparable studies in other western states.[26,50,60] When human-caused mortality in local management zones is kept below the intrinsic growth rate, it is most likely to mimic the effects of natural mortality and be the least disruptive to the cougar population.[26,51,69,74]

Old methods of assessing a cougar population depended on information about hunter effort, harvest data, conflict information, and anecdotal observations about cougar populations. However, these metrics are notoriously unreliable for estimating the size or density of a cougar population, or for detecting trends within that population.[22,51] Instead of continuing to rely on these outdated methods, we urge the Commission to look to the best-available science.[6,9,56]

Killing too many cougars will not solve conflicts, and may worsen them

A large body of science conducted by multiple research groups has produced a consensus that killing cougars is not the solution to cougar-related livestock losses or conflicts.[25,30,46,59,66] In fact, a growing number of studies suggest that excessive killing of cougars may actually increase levels of livestock and pet predation and other conflicts.[25,30,46,59,66] One Washington study found that while each additional cougar on the landscape increased the odds of a complaint or predation by 5%, each additional cougar that was killed the prior year increased the odds of complaints and predations by 50%.[59]

Although this result might seem counterintuitive, science provides biological explanations for why this would be the case. As explained above, high mortality creates population "sinks" that attract younger dispersing male cougars. Because younger male cougars have weaker territorial instincts, several

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[*] Bighorn sheep are a possible exception, where removal of cougars by wildlife agencies has, in some cases, been shown to benefit small, isolated populations.[63]

[†] This study classifies cougars over two years old as adults, while independent-age cougars include all those over 18 months old, including 18–24-month-old subadults.

[‡] A recent review of Google Scholar results shows 89 citations in high impact journals by diverse authors.

younger male cougars may replace the territory once occupied by a single older male.[46,51] As the number of younger male cougars in an area increase, so does the likelihood of conflict.[46,66]

As the immigration of new males into a territory increases the risks of infanticide of unrelated kittens, female cougars often move closer to human-occupied areas to protect their kittens.[13] Killing a female with dependent offspring leaves behind orphaned kittens and inexperienced sub-adults with unrefined hunting skills, which often venture closer to humans and are more likely to prey on domestic animals.[53] Thus, killing a single female in response to a predation can, and often does, result in continued predations, often leading managers to kill the entire family. For these reasons, areas of high mortality may also become areas of high cougar-human conflict.[25,30,46,59,66]

Cougar management should focus on eliminating "source-sink" dynamic

If managers want to minimize cougar-human conflicts and maintain a stable and sustainable cougar population, they should focus on keeping overall mortality to within the population's intrinsic growth rate— not only statewide, but in local areas, so as to eliminate the destabilizing source-sink dynamic.[5,7,9,61] Such a strategy should be implemented in accordance with the best-available science to: (1) use systematic field research to establish population densities; (2) apply those densities to available cougar habitat to estimate local cougar populations; (3) cap the mortality of adult and sub-adult cougars in these local areas below the intrinsic growth rate, considering mortality from *all* human sources (including harvest and non-harvest mortality), and (4) ensure that hunting closes quickly once the cap is reached.[7,9,22,27]

Rather than killing cougars due to conflicts, which can be counterproductive, we urge managers to place their emphasis on increasing education and outreach on topics such how to safely house livestock and pets and reduce attractants[70,71] Until these issues are solved, you are likely to see continued conflicts at the same locations.[25,30,46,59,66] In addition, as long as high levels of mortality persist, you may also see high levels of conflict, which in turn may lead to more mortality[25,59,66] Such conflict may only abate once mortality levels have been brought below the growth rate long enough to allow time for cougars to redevelop a stable social and territorial structure.

For the reasons discussed above, it is difficult for managers to detect trends in the cougar population that will alert them to when excess mortality statewide or in local areas is depressing the statewide population.[2] Once a cougar population decreases below a certain threshold, it may begin to drop precipitously, and the population may have already passed this threshold before managers can detect a drop by looking at harvest data.[58,66]

BLACK BEARS

Like cougars, black bears also play an essential role in their larger ecosystem, as seed-dispersers,[3,31,36,62] scavengers,[1] and predators,[11,77,78] and by enriching the soil.[34,39,77] Because the bear population is sensitive to overexploitation,[14] we urge the Commission to be thoughtful and careful in its approach to black bear management.

Black bears reproduce slowly. Female bears in the western U.S. usually do not begin to reproduce until they are at least four years old, after which they will give birth every other year, at most, to litters of between one and three cubs.[10,21] Humans are responsible for almost all black bear mortality. Although legal harvest is the top cause of mortality in Washington, conflict removal, poaching, and wounding loss are also significant contributors.[8,42] Research suggests that bear populations can withstand harvest levels of somewhere between 4 and 11%, although black bear population growth is highly variable and heavily influenced by factors such as available forage.[14,73]

Many states monitor for overexploitation of black bear populations by looking at the sex and ages of bears harvested by hunters. However, well-established science has shown that these methods are not reliable means of detecting population trends, as the sex and age structure of a declining bear population can be the same as the structure for an increasing population, and there is a significant lag time before trends can be detected through harvest data.[15,18,54,75]

Over the past few years, WDFW researchers have done extensive work to produce more reliable data about the state bear population.[8,72,73] We urge the Commission to implement a hunting structure based on this data as soon as practicable, so that it can set sustainable bear hunting limits and establish a more reliable means of monitoring trends in the population.

Policymakers should be alert to sudden and sustained increases in black bear mortality, especially if it is at or above the intrinsic growth rate either statewide, or in local areas. High harvest levels could cause rapid population decline, especially if they are coupled with a slowing of population growth—which can happen due to a poor berry season or other disturbances exacerbated by climate change.[23,40,45] Managers are unlikely to have the means to accurately assess the impact of such a rise in mortality, and they may not detect a downward trend in the overall population until after there has been a significant population drop, from which it could take decades to recover.[35]

CONCLUSION

Science is always evolving, and research on these issues will continue in years to come. However, the evidence behind our conclusions is robust and consistent across researchers and research methodologies, presenting a solid foundation for policymaking. Summarizing our conclusions, we believe is important for policymakers to consider several principles when deciding on the appropriate path forward for bear and cougar management. We urge policymakers to:

- Ensure that they are informed by the best-available science before making management decisions;
- Use high-quality, science-based estimates of population densities and growth rates, rather than relying upon anecdotal evidence that may be misleading;
- Be transparent about the dividing line between policy decisions and science, so the public has a clear understanding of the reasoning behind certain decisions and their possible implications;
- Count all sources of mortality when determining whether bear and cougar hunting levels are sustainable;

- Manage conservatively in the face of uncertainty, especially in the age of climate change, and with populations such as cougars and bears that can be sensitive to overexploitation, and may suffer significant declines before managers detect those trends; and
- Respond quickly to signs of overexploitation at either the statewide or local level and make prompt course corrections to maintain stable and sustainable populations.

Issues related to large carnivores often inspire an emotional and passionate response from the public, creating a difficult political situation for policymakers.[24] That can be exacerbated because some of the science points to counterintuitive conclusions. We urge policymakers to navigate this situation with the best-available science as their north star, and to take the lead in educating their communities about the science and the impact of cougar and bear management decisions.

We hope our insight is helpful to you in making your upcoming decision.

Sincerely,

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