"Intensive Management" (i.e. predator control) is not based on the best available science

In 1994, the Alaska Legislature mandated that the Alaska Board of Game (BOG) institute "Intensive Management;" that is, expensive, wanton, cruel, unscientific predator-control practices ostensibly to reduce predators to grow ungulate numbers for hunters. As we show here, Intensive Management is an utter failure, even according to Alaska Department of Fish and Game's (ADFG's) own biologists' reckoning.

Even as the BOG uses federal funds to kill predators (ostensibly to grow game herds), the numbers of Alaskan hunters has likely decreased significantly since 2011, undermining Alaska's entire premise for Intensive Management program. As of 2020, less than 13% of the Alaskan public held a hunting license.

The BOG's Intensive Management policy dictates that ungulates' predators must be eliminated or reduced in order to boost ungulate herds for human consumption. This policy, predicated upon the notion that killing predators will boost prey numbers, is faulty. The best available science indicates that widespread elimination of bears, coyotes and wolves is unlikely to restore ungulate herds.[1]

The newest science that investigates the efficacy of predator control indicates that predator controls almost invariably fail because of other forces, including bottom-up pressures (such as stochastic weather events—including drought or crusting of snow) and meso-predator release (which increases competition for the same prey animals).[2] Additionally, recent comprehensive studies that have evaluated the efficacy of predator-control schemes show that they are unsupported by the best available science, and these comprehensive studies also show that predator control is ineffective, expensive and fails to consider non-lethal solutions.[3]

1. **ADFG's biologists, Boertje et al. (2017**), discovered that ungulates are limited by their carrying capacity. From 1973 to 1975,[4] the migratory Fortymile caribou herd in Alaska reached a low of 6,000 members. According to ADFG's own biologists, the final decline of the migratory Fortymile caribou herd was precipitated by excessive hunting during 1970 through 1973, when the reported caribou harvests ranged from 10 to 20 percent of the estimated population.[5] To compensate, from 1973 to 2013, the ADFG curbed hunting and began to "manage" wolves, ostensibly to help the herd increase. From 1998 to 2004, ADFG used non-lethal, wolf-control methods (sterilizations and translocations), but from 2005 to 2013, agents, hunters and trappers killed wolves from planes and helicopters, ground shooting and by trapping.[6]

   As a result of these measures (reduced hunting pressures and excessive wolf killing), the caribou herd soared to 52,000 members. As the herd came close to, and then surpassed 52,000 members, the numbers of breeding females declined, calves' fall weight decreased, and the herd migrated earlier during seasons, indicating that it had exceeded the land's carrying capacity. Wolf controls failed to increase caribou survival.[7] R.D. Boertje, an employee of ADFG, and his colleagues write:

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[1] e.g., C. J. Bishop et al., "Effect of Enhanced Nutrition on Mule Deer Population Rate of Change," *Wildlife Monographs*, no. 172 (Jul 2009), http://dx.doi.org/10.2193/2008-107; M. A. Hurley et al., "Demographic Response of Mule Deer to Experimental Reduction of Coyotes and Mountain Lions in Southeastern Idaho," *Wildlife Monographs*, no. 178 (Aug 2011), http://dx.doi.org/10.1002/wmon.4; National Research Council, *Wolves, Bears, and Their Prey in Alaska* (Washington, D.C.: National Academy Press, 1997); C. D. Mitchell et al., "Population Density of Dall's Sheep in Alaska: Effects of Predator Harvest?," *Mammal Research* 60, no. 1 (Jan 2015), http://dx.doi.org/10.1007/s13364-014-0199-4; Boertje et al; Lennox et al.

[2] Lennox et al; Bergstrom.

[3] A. Eklund et al., "Limited Evidence on the Effectiveness of Interventions to Reduce Livestock Predation by Large Carnivores," *Scientific Reports* 7 (May 2017), http://dx.doi.org/10.1038/s41598-017-02323-w; Adrian Treves, Miha Krofel, and Jeannine McManus, "Predator Control Should Not Be a Shot in the Dark," *Frontiers in Ecology and the Environment* 14, no. 7 (2016), http://dx.doi.org/10.1002/fee.1312; Francisco J. Santiago-Avila, Ari M. Cornman, and Adrian Treves, "Killing Wolves to Prevent Predation on Livestock May Protect One Farm but Harm Neighbors," *PLOS ONE* 13, no. 1 (2018), http://dx.doi.org/10.1371/journal.pone.0189729; Bergstrom; Lennox et al.

[4] Boertje et al.

[5] Patrick Valkenburg et al., "Case History of the Fortymile Caribou Herd, 1920-1990," *Rangifer* https://septentrio.uit.no/index.php/rangifer/article/view/1128 (1994), http://dx.doi.org/https://doi.org/10.7557/2.14.1.1128.

[6] Boertje et al.

[7] Ibid.

[W]hen ungulates overshoot carrying capacity, the effects of high density, adverse weather, and increased predation can have synergistic negative effects on prey numbers and long-lasting negative effects on sustainable yields, contrary to the intended purpose of the wolf control programs.[8]

In short, ADFG's own officials note that despite Alaska's very expensive (and cruel) wolf massacres, their goal of creating a caribou game farm for hunters in Alaska utterly and woefully failed because too many ungulates are not sustainable upon Alaska's fragile tundra ecosystems—these herds exceed the land's carrying capacity.

2. **Alaska NPS employees, Schmidt et al. (2017)**, intensively monitored wolves in the Yukon-Charley National Preserve in interior Alaska for 22 years to determine if the State's wolf-control program on the border of the Preserve would affect wolves.[9]

   During the State's lethal-wolf-control period, wolf survival inside of the safe boundaries of the Preserve declined, showing that the lethal control outside the Preserve created additional (that is, "additive") mortalities. Wolves who ventured beyond the invisible demarcation of the Preserve were killed. Because of these numerous mortalities, wolves within the Preserve sharply increased their reproduction; but when no wolf control was in progress, wolves lowered their reproduction. (Wolf biologists in Canada discovered the same compensatory, breeding behaviors.[10])

   Despite wolves' reproduction increases, lethal-wolf controls outside the Preserved harmed their populations and family groups inside the Preserve. The loss of wolves contributed to pack dissolution, resulting in additional mortalities.[11] The wolves within the Preserve adjacent to the State's lethal-control areas, became wolf "sink" areas reliant upon surrounding populations' migrants in order to persist. In short, the NPS could not protect the wolves in its boundaries because the State's policies were so draconian.

3. **Alaska researchers, Prugh and Arthur (2015)**, found that wolf control in their Alaska study area led to the decline of Dall's sheep. With the loss of wolves, coyote numbers increased and they more readily preyed upon young Dall's sheep. [12] This phenomenon has been documented many times in several ecosystems. Top carnivores limit the population size of smaller carnivores, which reduces overall predation pressures,[13] and this natural regulation is especially important for survival of neonate ungulates such as moose and caribou.[14]

4. **Alaska researchers, Mitchell et al. (2015),** in their study found that heavy persecution of both wolves *and* coyotes initially increased the number of Dall's sheep in their study area, but when the sheep population approached or exceeded the carrying capacity, which is a maximum population size set by the amount of forage available or "K", a severe winter (with deep snows and heavy crusting) counteracted population increases.[15] Meanwhile in the reference area (where no predator control measures were implemented), the Dall's sheep

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[8] Ibid.
[9] Schmidt, Burch, and MacCluskie.
[10] Heather M. Bryan et al., "Heavily Hunted Wolves Have Higher Stress and Reproductive Steroids Than Wolves with Lower Hunting Pressure," *Functional Ecology* (2014), http://dx.doi.org/10.1111/1365-2435.12354.
[11] S. Creel et al., "Questionable Policy for Large Carnivore Hunting," *Science* 350, no. 6267 (Dec 2015), http://dx.doi.org/10.1126/science.aac4768; Creel and Rotella.
[12] L. R. Prugh and S. M. Arthur, "Optimal Predator Management for Mountain Sheep Conservation Depends on the Strength of Mesopredator Release," *Oikos* 124, no. 9 (Sep 2015), http://dx.doi.org/10.1111/oik.02017.
[13] W. J. Ripple et al., "Trophic Cascades from Wolves to Grizzly Bears in Yellowstone," *Journal of Animal Ecology* 83, no. 1 (Jan 2014), http://dx.doi.org/10.1111/1365-2656.12123; A. D. Wallach et al., "What Is an Apex Predator?," *Oikos* 124, no. 11 (Nov 2015), http://dx.doi.org/10.1111/oik.01977; K. R. Crooks and M. E. Soule, "Mesopredator Release and Avifaunal Extinctions in a Fragmented System," *Nature* 400, no. 6744 (Aug 5 1999), <Go to ISI>://000081854800055; K.M. Berger, EM Gese, and Joel Berger, "Indirect Effects and Traditional Trophic Cascades: A Test Involving Wolves, Coyotes, and Pronghorn," *Ecology* 89, no. 3 (2008).
[14] Prugh and Arthur; Berger, Gese, and Berger.
[15] Mitchell et al.

population remained constant.[16] In other words, natural predation on Dall's sheep was "compensatory," meaning it merely replaced mortality from weather and starvation. These biologists caution against predator control policies as a means of increasing prey herds.

Mitchell et al. (2015) warn:

> We note that [ADFG] biologists have previously attempted to manipulate moose and caribou population in central Alaska using harvest and predator control (Boertje et al. 1996, 2009), without considering *K* [carrying capacity] (Bowyer et al. 2005). This strategy had negative results, not only for moose populations and [hunter] harvest, but also for agency credibility (Young and Boertje 2011). Managers now realize that carrying capacity (Seaton et al. 2011) is an integral component of effective management of moose populations . . . . Management decisions regarding carnivore harvest should consider both the positive ecological roles of predators and the potential negative effects on both the carnivores populations, community ecology, and consideration (Roemer et al. 2009; Ordiz et al. 2013). This should help wildlife managers avoid the unintended consequences in various management actions.[17]

As Mitchell et al. (2015) detail here, Alaska state wildlife managers failed to consider carrying capacity of ungulates in project after project. They also have had serious harmful effects on wolves and bears.

5. **Former Alaska state biologists, Miller et al. (2011),** write that the mean annual number of brown bears killed between 1976-1980 equaled 387 but that number jumped to 827 annually for the years between 2004 and 2008, a 113 percent increase.[18] Miller et al. (2011) strongly suggest that the BOG's management is politically, not scientifically driven and could result in widespread reductions of Alaska's brown bear populations. In their newest article, Miller et al. (2017) write: "To our knowledge, outside of Alaska, no place in the world has management objectives designed to reduce" brown bear, black bear and wolf "population[s] abundance across large areas by encouraging increased hunter harvests."[19] The primary motivation for this policy, they write, is to increase moose and caribou for human hunters.[20] Because brown bears have a "low reproductive rate," female brown bears cannot withstand mortality beyond four to nine percent of their number.[21]

[16] Ibid.
[17] Ibid., 26.
[18] Sterling D. Miller et al., "Trends in Intensive Management of Alaska's Grizzly Bears, 1980-2010," *Journal of Wildlife Management* 75, no. 6 (Aug 2011 2011), http://dx.doi.org/http://dx.doi.org/10.1002/jwmg.186.
[19] Miller, Schoen, and Schwartz.
[20] Ibid.
[21] Ibid.citing Miller (1990), Schwartz et al. (2003) and Harris et al. (2006)

Fig. 3. Miller et al. (2017)

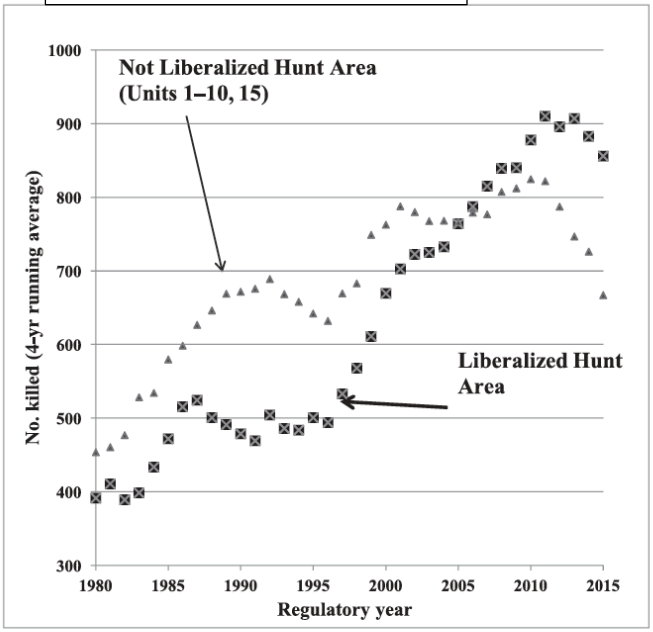

Fig. 2. Number of brown bears (*Ursus arctos*) killed by hunters (4-yr running averages) in the Liberalized Hunt Area (76% of Alaska) and elsewhere in Alaska, USA, by regulatory year.

Before 1990, a bear hunter was permitted only one bear every four years.[22] But from 1995 to 2018, **Alaska liberalized hunting regulations for brown bears 222 times**, with regulations such as increasing the bag limit to two bears per hunter per year, allowing hunting over bait, killing a bear prior to buying a $25 brown bear hunting tag and allowing the commercial sale of hides, claws and skulls. Alaska wildlife managers have even allowed unsustainable hunting levels on a small population of Kenai brown bears resulting in the Kenai National Wildlife Refuge having to institute emergency bear-hunting closures to save the last Kenai brown bears.[23]

The levels of brown bear hunting in Alaska are alarming and extreme, with over 900 brown bears killed annually since 2011. Fig. 3. Since 2000, Alaska has allowed trophy hunters to excessively kill brown bears—even as it fails to adequately monitor their populations—but for the fact that hunters are now unable to kill as many bears as they had done previously,[24] likely because they are in population decline. Miller et al. (2018), not unlike many other biologists who conduct wildlife research in Alaska, conclude:

State management of wildlife in Alaska has become a process whereby population objectives for wild ungulates are established based on demand rather than on habitat capacity. In Alaska, this has created a mandate to control brown bears, black bears, and wolves in the hope that hunter demand for meat from moose and caribou can be satisfied.[25]

In short, the Trump-era rule allowed some of the most inhumane and barbaric methods to kill America's iconic wildlife on treasured federal lands in Alaska in the mistaken *belief* that their deaths will bolster moose, caribou and ungulate numbers to benefit a tiny minority of people.

[22] Ibid.
[23] Ibid.
[24] Ibid.
[25] Ibid., 144.