

July 29, 2019

The Honorable John Barrasso
Chairman, Committee on Environment and Public Works
United States Senate
410 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Thomas Carper
Ranking Member, Committee on Environment and Public Works
United States Senate
456 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Barrasso and Ranking Member Carper:

I very much appreciate the opportunity to provide a written statement offering my thoughts not only about the proposed “Promoting Resourceful and Effective Deterrents Against Threats Or Risks involving Species (PREDATORS) Act” (S. 2194), but also the larger challenges of non-lethal coexistence between grizzly bears and people. Please accept these comments for the official record.

A Bit about Me

I spent much of my 40-year professional career studying mountain lions and grizzly bears with the tacit and even explicit goal of better understanding relations between these large carnivores and people. My involvement in grizzly bear research and management ranged from Kluane National Park in the Yukon, through the Mountain Parks of Canada, to the Greater Yellowstone Ecosystem of the United States. My investigations of mountain lions spanned six different study areas in the Southwest, including two in Utah, one in Nevada, and three in Arizona.

In addition to straight-forward ecological studies, my research has focused on conflict between large carnivores and people, as well as among people over carnivores. Of particular relevance here, my studies of mountain lions focused on factors affecting the outcomes of close encounters with people, as well as human safety in urban-wildland contact zones. My research with grizzly bears included close scrutiny of factors driving conflicts on agricultural landscapes in Montana. More recently, I’ve served as an advisor for non-profit organizations seeking to develop and promote a coexistence infrastructure. Until my retirement in 2015 I also taught topically relevant classes at Yale and the Massachusetts Institute of Technology that were the catalyst for thinking more comprehensively about human-carnivore coexistence.

Institutions are Far More Important than Technology

As evidenced by the proposed PREDATORS Act, non-lethal prevention and mitigation of conflict with humans is recognized by many as central not only to human safety, but also to long-term conservation of large carnivores. My 40 years of experience have taught me, though, that tactics and technologies for preventing and mitigating conflicts can only be effectively deployed as part of a coexistence infrastructure embedded in well-resourced and otherwise sustainable coexistence institutions. Moreover, any meaningful response to long-standing and emerging domains of conflict requires insight into the full panoply of relevant drivers, both human and natural.

Tactics, methods, and technologies are necessary elements of coexistence between people and carnivores, yet only a small part of effective nonlethal regimes. Without intending to disparage the laudable intentions of the proposed Theodore Roosevelt Genius Prize, drones, TASERs, helicopters, and sundry other technologies have been and will continue to be less important—even far less important—than the other, albeit more challenging, facets of coexistence endeavors.

Moreover, insofar as human-grizzly bear conflicts are concerned I contend that most of the important technologies have been invented, even perfected, and that any increments of gain will be well out on the curve of diminishing returns. Numerous really smart creative people have already provided us with highly effective bear-proof or resistant electric fencing, garbage containers, food storage, transfer stations, plus proven carcass composting, deterrent sprays, guard-dog breeds, and husbandry practices.

With that seminal point in mind, I hope in what follows to clarify what I see as the main domains, drivers, and challenges of grizzly bear-human conflict.

Conflicts Occur in Different Arenas with Different Authorities

All but a trivial number of human-grizzly bear conflicts can be assigned to six domains typified by shared drivers and common solutions:

- (1) Attractants such as garbage and small domestic animals associated with private residences;
- (2) Collisions with vehicles and trains travelling along heavily-trafficked transportation corridors;
- (3) Attractants and depredations on private agricultural lands;
- (4) Depredations and scavenging of domestic livestock on public land grazing allotments;
- (5) Competition and close encounters with big game hunters on public lands; and
- (6) Displacement and poaching associated with secondary road systems—also on public lands.

An important higher-order distinction can first be made between human activities associated with conflicts that are wholly confined to private lands, where options for government intervention are more limited (as with [1] and [3]); versus human activities located on public lands or entailing common pool

resources, over which government authority is well-established ([4], [5], and [6]); versus activities on both private and public lands, but on rights-of-way over which governments have primacy ([2]).

These distinctions readily differentiate domains where the primary tools to foster coexistence entail persuasion, subsidies, assistance, and other enticements ([1], [3]) from those where governments have authority to mandate, prohibit, or authorize. In other words, the role of government in modifying human behaviors is inescapable when it comes to managing human-carnivore conflicts—even the adoption of technologies. Corporations and non-profit organizations do not have sufficient authority or even resources.

Most Drivers of Increased Conflict are Directly Related to Humans

The over-arching human drivers of conflict are unambiguous. Leaving aside the all-important role of worldviews and attitudes for the moment:

- (1) Conflicts over residential attractants are mounting as regional populations steadily increase (e.g., the Flathead Valley in Montana).
- (2) Likewise, bear deaths from collisions with vehicles and trains have climbed dramatically commensurate with increasing traffic on highways and railways, both as a function of increased intra-regional as well as national through-traffic (e.g., along the Highway 2-Burlington Northern Santa Fe transportation corridor in Montana).
- (3) Conflicts on public land grazing allotments have skyrocketed, partly because of changes in bears diets and behaviors (see below), but also because government agencies have surrendered their responsibilities for prudent permitting in the face of political pressure generated by well-connected ranchers (e.g., the Upper Green River complex of grazing allotments in Wyoming).
- (4) Similarly, conflicts over agricultural attractants on private lands have escalated, again in part because of changing bear behaviors (see below), but also because resources and enticements sufficient to deploy proven coexistence techniques have not been available (e.g., the Rocky Mountain Front and eastward in Montana).
- (5) Conflicts involving sport hunters have steadily increased despite declining and then static hunter numbers, partly because of changing bear diets (see below), but also partly because government bureaus, notably Wyoming's Game & Fish Department, have failed to propagate reasonable and prudent regulations mandating deployment of preventative practices (e.g., requiring that hunters carry deterrent sprays, limiting the time of day when hunting is allowed, and compelling the surrender of hunter-kills when usurped by scavenging bears).
- (6) Finally, conflicts and bears deaths associated with secondary roads on public lands take a steady toll, and promise to mount as the US Forest Service launches ambitious programs to build and resurrect roads in support of industrial-scale timber harvest (e.g., the Kootenai and Flathead National Forests in Montana).

Importantly, the trends identified in [3], [5], and [6] are closely identified with private individuals gaining profit or pleasure from public resources. As important, with the exception of vehicle and train collisions,

technology will predictably play a minimal, even inconsequential, role in addressing problematic human drivers of conflict between people and grizzly bears.

Environmental Change Rooted in Anthropogenic Causes is Also Driving Conflicts

The other major suite of factors driving grizzly bear-human conflicts pertain to the numbers, distributions, diets, and behaviors of grizzly bears linked, in turn, to past and present environmental conditions. As it turns out, minimal or even non-existent increases in grizzly bear numbers are probably the least important of these drivers.

Minimal Growth of Bear Populations Does Not Explain Increasing Conflicts

Distributions of grizzly bears in the Greater Yellowstone (GYE) and Northern Continental Divide (NCDE) Ecosystems have indisputably undergone major expansions during the last 20-40 years, often into agricultural, industrial, and residential areas where conflicts with humans invariably follow. The question, though, is whether these increases in distribution have been driven wholly or even largely by increasing bear numbers, or by environmental changes that have produced comparative redistributions of high-quality foods towards the peripheries of these two key ecosystems—driving a comparative redistribution of bear populations towards the periphery as well.

In fact, growth of grizzly bear populations has stalled in the GYE and NCDE during the last 5-20 years. There has been essentially no increase in numbers of reproductive females since the early 2000s within the Demographic Monitoring Area (DMA) of the GYE, which encompasses almost all grizzly bears in the ecosystem. Numeric increases outside the DMA are unknown, but certainly modest and comprised disproportionately of male bears. An almost identical situation exists in the NCDE, although obfuscated by reliance of biologists in this ecosystem on notoriously unreliable methods using data that are, on average, a decade old.

This lack of increase in bear populations begs the question of why grizzly bear are showing up in ever more areas. In fact, the pace at which bear *distributions* have increased in the both the GYE and NCDE has far outstripped even the most inflated claims regarding *numeric* increases of these grizzly bear populations. Rapid increases in population distributions—and related increases in conflict with humans on agricultural lands, in residential developments, and while hunting—cannot be adequately explained by the modest, even nonexistent, growth of grizzly bear populations.

By contrast, much has changed environmentally, most prominently for grizzly bears in the GYE, but also for bears in the NCDE. Although these environmental changes have occurred in the putative natural realm, to call them “natural” is a misnomer given that virtually all have been driven by either anthropogenic climate warming or by invasive non-native species introduced by humans.

Deteriorating Environmental Conditions are Driving Conflicts in the GYE

In the GYE, grizzly bears have suffered catastrophic losses of high-quality foods that previously concentrated them in areas remote from people. Over 70% of mature whitebark pines (a source of fat-rich seeds) was killed in an alarmingly brief 10-year period by an unprecedented outbreak of mountain pine beetles unleashed upon the formally frigid haunts of this tree species by climate warming.

Cutthroat trout, previously available in the center of Yellowstone National Park to bears while spawning in streams tributary to Yellowstone Lake, were functionally extirpated as a bear food by predation from an introduced non-native fish species (Lake trout), but with the effects of this predation exacerbated by deteriorating hydrologic conditions driven by climate change.

Beginning in the mid-1990s, all of the elk herds in core grizzly bear habitat simultaneously declined—some precipitously so—from the combined effects of human sport hunting, grizzly bear predation, wolf predation, and deteriorating summer range conditions, the last also driven by climate warming.

Most of these deleterious changes culminated between 2005 and 2010, shortly before a rapid expansion in distribution of the GYE grizzly bear population and related exponential increases in conflicts with ranchers and big game hunters over meat resources located mostly on public lands. The foci of these conflicts were (and continue to be) livestock on public grazing allotments and publicly-owned elk pursued and killed by sport hunters.

These dramatic increases in meat-related conflicts were unambiguously linked to increased consumption of meat by grizzly bears in compensation for losses of other foods. And, more importantly, all of these dynamics were rooted in anthropogenic causes. None are plausibly explained simply by increases in bear numbers.

Deteriorating Environmental Conditions are Also Driving Conflicts in the NCDE

Similar changes have assaulted grizzly bears in the NCDE. Here, as well, whitebark pine was functionally extirpated, but during an earlier period (1980s-2000) by a non-native fungal pathogen called white pine blister rust. Not by coincidence, the first major expansion eastward of this bear population followed final extirpations of whitebark pine along the Rocky Mountain Front.

On the west side of the ecosystem a sustained drought during 1998-2008 produced a berry famine during which production of fruit on three of the most important berry-producing shrubs was at a nadir. Again, not by coincidence, rapid expansions of the bear population to the west ensued.

Meanwhile, acreages burned by wildfires throughout the NCDE rapidly increased during the same drought period, resulting in a sustained pulse of transient unproductive habitats, the prelude to yet another rapid expansion of grizzly bears to the south and east out from the Rocky Mountain Front. As further inducement for wandering grizzly bears, this period of expansion onto private agricultural lands

coincided with restocking of cattle numbers to record levels after a drought-driven decline, synchronous with a substantial drop in numbers of mule deer, the main alternate source of meat other than livestock for grizzly bears on the High Plains.

Here in the NCDE, as in the GYE, almost all of the deleterious environmental changes plausibly driving expansion of grizzly bears into conflict arenas is ultimately rooted in human causes, including anthropogenic climate warming. Perhaps as much to the point, little of the increased conflict between grizzly bears and humans in the NCDE can be attributed simply to the minimal likely increase in grizzly bear numbers.

Environmental Conditions Will Continue to Deteriorate

Projected environmental trends are not auspicious for grizzly bears. Numbers of people and the associated extent of housing developments and transportation infrastructure will almost certainly steadily increase in the Northern Rockies. Inescapably, conflict arenas will expand and intensify, as will barriers to movement by grizzly bears.

Insofar as foods are concerned, most will likely decline. Climate warming will preclude any chances for recovery or restoration of whitebark pine. Cutthroat trout will also be subject to continued habitat degradation that will prevent meaningful restoration to ecological functionality. The best available science suggests that key berry-producing shrubs will be less abundant throughout the Northern Rockies. Some species are projected to decline catastrophically. Intensified droughts from warming—sufficient to negate any increases in precipitation—will continue to reduce the fecundity of elk. Wildfires will become extensive and frequent enough to overthrow conventional notions that disturbance benefits bears. And army cutworm moths will likely disappear as a food source for bears with disappearance of the alpine flowers that currently sustain over-summering moths.

And what about replacement foods? Most candidates are either unidentified, of lesser quality to the ones likely to be lost, or unlikely to colonize at a pace that compensates for rates of loss. The world will almost certainly become a more difficult place for remaining grizzly bears in the contiguous United States, with predictable intensification of conflicts with humans.

Solutions will Require Honesty, Institutions, Resources, and Reform of State Management

Any meaningful non-lethal response to the daunting challenges of human-grizzly bear coexistence will require honesty about the drivers of conflict. Only then can we collectively develop meaningful and comprehensive strategies focused on priority landscapes. However, effective implementation of such strategies will require substantial human and financial resources, supportive institutions, and changed attitudes among people currently populating state wildlife management agencies.

Unfortunately, willful denial of the dominant and multi-faceted role played by humans in conflicts with grizzly bears is commonplace—including the role of anthropogenic climate warming. The invocation of

phantom increases in grizzly bear populations merely aids and abets this denial, as does a focus on technological rather than cultural and institutional solutions.

One of the biggest obstacles, though, is in the finances, cultures, and practices of state wildlife management agencies, nowhere more so than in Wyoming and Idaho. The default preference among state wildlife managers is unambiguously for lethal solutions to perceived problems. This cultural proclivity is reinforced by financial dependencies upon hunters that create a business model premised on producing harvestable surpluses to satisfy the presumed customer.

This core institutional dynamic will confound any attempt to foster widespread coexistence between people and grizzly bears given that state wildlife managers have an inescapably important role to play. So long as wildlife managers see the solution to human-grizzly bear conflicts as primarily one of killing more bears—whether through sport hunting, lethal resolution of conflicts, or more effectively arming people—gains will be marginal at best in areas of state jurisdiction.

Nowhere is this core problem more evident than in testimony submitted to this committee by Brad Hovinga, representing Wyoming Game & Fish Department, or in a recent decision by his Department's Commission *rejecting* a petition requesting, simply, that hunters licensed by Wyoming be required to carry a proven non-lethal deterrent while hunting in occupied grizzly bear habitat.

Social Acceptance is Little More Than a Political Football

As a perhaps logical derivative of preference for lethal regimes, state wildlife managers such as Mr. Hovinga commonly argue that killing more grizzly bears, whether by trophy hunting or more prompt lethal response to conflicts, will create more “social acceptance” of grizzly bears. However this argument has shaky logical foundations, is at variance with the best available evidence, and is prefaced on a narrow and exclusionary definition of who the public is.

The presumption seems to be that killing grizzly bears, for example through sport hunting, will make those who are currently intolerant of live grizzly bears become more tolerant. Yet the limited research done on this dynamic, notably by Dr. Adrian Treves, suggests that there is no effect, or that the opposite occurs. Intolerance among the intolerant typically remains unchanged, with evidence even of increased poaching as a probable consequence of the tacit permission for such behaviors given by implementation of regimes that prioritize killing carnivores.

Moreover, my personal experience as well as that of coexistence professionals with whom I closely work clearly shows that those who are intolerant will consistently opt for lethal remedy as long as such remedy is readily available and authoritatively sanctioned. Under such circumstances, there is little incentive for such people to undertake the effort or expense of deploying non-lethal preventative measures. More to the point, increasingly permissive lethal regimes will predictably undercut—even negate—the hard work of developing non-lethal regimes founded on widespread adoption of new practices.

Perhaps most problematic, the social acceptance argument fielded by state managers tacitly defines “the public” as being a very small minority defined by a particular geography, ideology, and demographic profile. In other words, those who are currently intolerant of grizzly bears are ideologically predisposed to be intolerant, in a politically favored status, and comprising $1/10^{th}$ of 1 percent of the American public. By contrast, surveys of the American public writ large consistently show (for example) that around 70% of adults oppose or find morally unacceptable trophy hunting of any animal—including grizzly bears. Similarly, a super-majority of Americans enthusiastically supports recovery of grizzly bears and flock to places such as Yellowstone National Park every year wanting to see live bears.

As a corollary, state wildlife managers as well as certain ranchers and hunters also commonly argue that a small number of local people are burdened with the costs of having grizzly bears, whereas a large number of more distant people reap the benefits. Inequity is the central implied issue. Yet such asymmetries are commonplace with common pool resources. In fact, the local residents who bear most costs are, in the main, heavily subsidized by American tax-payers, including those who graze cattle on public lands for private profit at rates well below market, or those who benefit from hunting for pleasure on public lands maintained at public expense. With such subsidies comes an obligation on the part of beneficiaries to constructively deal with any incurred marginal costs.

In short, there is little or no moral or evidentiary basis for killing more grizzly bears to purportedly build more social acceptance.

People Are Far More Dangerous to Grizzly Bears than Grizzly Bears Are to Us

My concluding thought pertains to human safety during close encounters with grizzly bears, drawing not only on publicly-available data, but also upon my own numerous close run-ins with these bears. First, regarding the data: only 80 people are known to have been killed by grizzly bears in North America going back as far as written records take us—to the mid-1800s. During this same time, people have killed literally 10s of thousands of grizzlies.

Even in the contiguous United States, where grizzly bears still receive Endangered Species Act protections, 80-90% of all the adolescent and adult bears that die do so from human causes, amounting to hundreds of dead bears during the last two decades alone. By comparison, $1/1000^{th}$ of one percent of all people who venture out of their cars and into the back country occupied by grizzly bears are killed or injured by a grizzly. The asymmetry of risk is profound. We are far more deadly to grizzly bears than they are to us.

Moreover, having closely scrutinized many of the circumstances under which human injury and death occurred—and been close witness to four—I can confidently assert that most could have been averted by common sense, increased awareness, prudence, better regulations, and better enforcement of regulations. Certainly that holds for the large majority of cases involving hunters.

More concretely, requiring that hunting occur only during morning hours; that carcasses unsecured by nightfall be abandoned; that carcasses approached by a bear likewise be abandoned; that hunting clients be accompanied by a minimum of two guides; plus prohibiting bow hunting in grizzly bear habitat—together would deal with nearly all current risk to hunters. Yet, clearly, to do so would require that state wildlife managers change their stance from that of business-people providing a product to paying customers, to that of stewards of the public trust with an obligation not only to wildlife, but also human safety.

And, finally, insofar as my personal experiences are concerned, including numerous close encounters with—even charges by—grizzly bears, my conclusion is that situational awareness, knowledge of bears, and calmness are the ingredients most critical to a successful outcome. Technology is no substitute, nor, as a friend of mine quipped, is it “brains in a can.”

Please contact me if you would like to obtain my resume or scientific literature supporting my testimony. I can be reached at davidjmattson@gmail.com or at 406-222-4702.

Respectfully,

A handwritten signature in black ink that reads "David J. Mattson". The signature is written in a cursive style with a large, stylized initial "D".

David J. Mattson, PhD