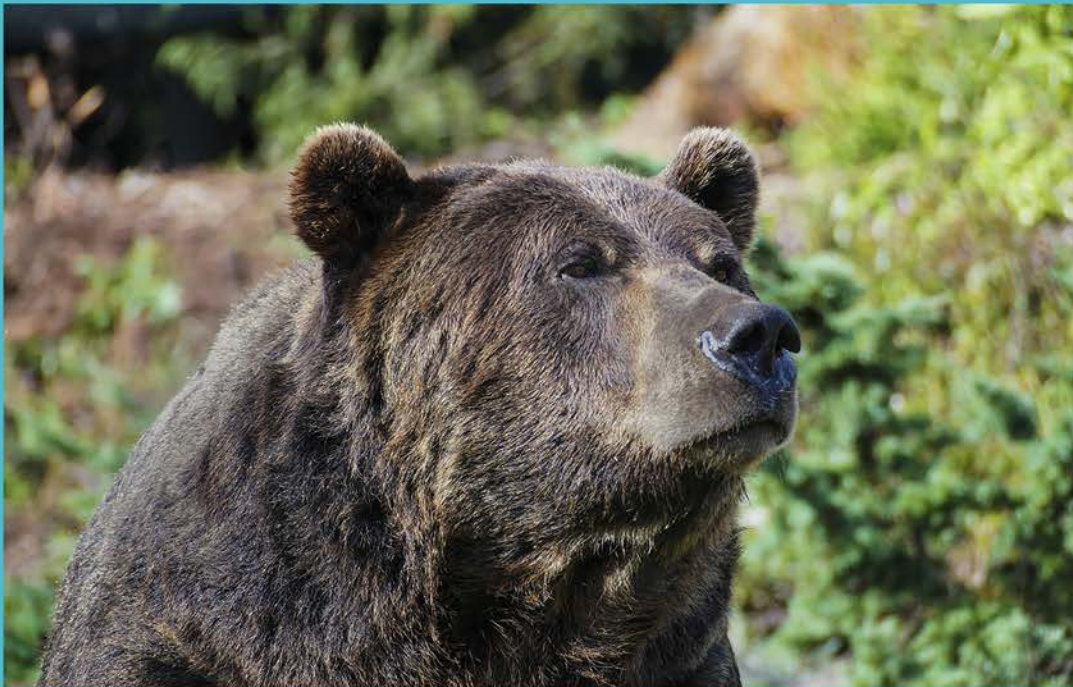


Comments on the Draft Montana Statewide Grizzly Bear Management Plan and DEIS



**Flathead-Lolo-Bitterroot Citizen Task Force • WildEarth Guardians
Wilderness Watch • Western Watersheds Project • Friends of the Bitterroot
Swan View Coalition • Friends of the Clearwater
Yaak Valley Forest Council • Conservation Congress • Footloose Montana
Montana Wilderness Education School • Gallatin Yellowstone Wilderness Alliance
Brian Horejsi PhD, Speak Up For Wildlife Foundation • Barrie K Gilbert PhD
Ecological Research Services • Gallatin Wildlife Association • David Mattson PhD
NW Great Old Broads for Wilderness • Friends of the Wild Swan
Bozeman Great Old Broads for Wilderness • Lee H Metzgar PhD
Frank Lance Craighead, PhD • Missoula for Bears • Save the Yellowstone Grizzly
Park County Environmental Council • The Humane Society of the United States
Center for Biological Diversity**

February 1, 2023

Ken McDonald
Wildlife Division Administrator
Montana Fish, Wildlife & Parks
P.O. Box 200701
Helena, MT 59620-0701

Submitted electronically to: kmcdonald@mt.gov

February 1, 2023

Introduction

We the undersigned organizations and individuals have long term commitments spanning decades in recovering and maintaining a viable metapopulation of grizzly bears in the Northern Rockies, its five grizzly bear recovery areas and the connective habitats between them.

The geographic location of Montana provides unique opportunities and responsibilities for recovery of grizzly bears in the northern Rockies. All of the Northern Continental Divide (NCDE), most of the Cabinet-Yaak (CYE), a substantial portion of the Greater Yellowstone (GYE) and a portion of the Bitterroot (BE) Grizzly Bear Recovery Areas are within Montana. Moreover, almost all of the connectivity habitat between these Recovery Areas and Demographic Monitoring Areas (DMAs) is located within Montana including the two designated Demographic Connectivity Areas.

The task of recovering a genetically viable and demographically connected grizzly bear population is far from complete and in our view, the Draft Montana Statewide Grizzly Bear Management Plan (Draft Plan) would thwart rather than advance these goals, based upon the best available scientific and commercial information available.

The Draft Plan is a disappointment. It very transparently views grizzly bear delisting as a speed bump on the way to trophy hunting of grizzly bears and systematic population reductions as a matter of policy. There are a host of biases and deficiencies in the Draft Plan that render it an “inadequate regulatory mechanism” which in unison with other inadequate regulatory mechanisms and threats to grizzly bear habitat and survival raise an insurmountable legal bar to delisting from Endangered Species Act (ESA) protections. The Draft Plan must be withdrawn and redone to remove the pervasive bias and to correct the numerous deficiencies outlined in detail below.

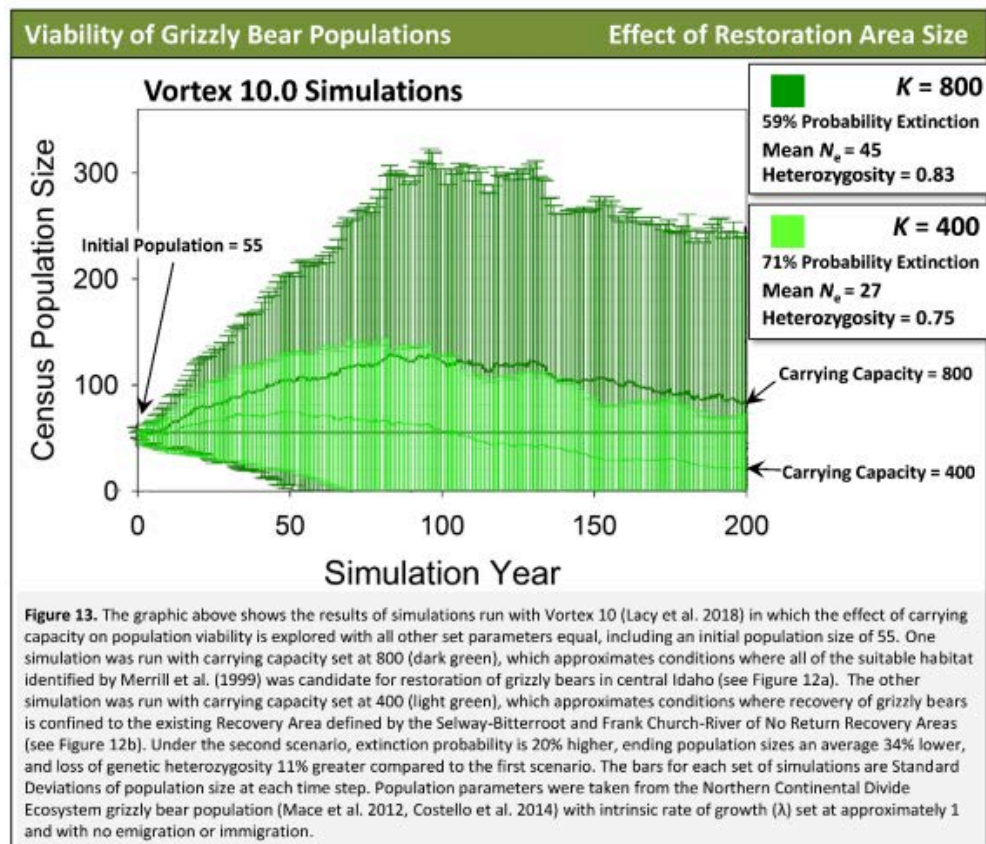
The order of our comments does not constitute a ranking of importance. All of our comments have equal weight.

Population Goals, Viability and Connectivity

The statement found on Page 47 of the Draft Plan is incorrect. The Montana Legislature is not a scientific body nor is it qualified to make a judgment that the NCDE population is “recovered.” Recovery is a legal definition under the ESA.

The shortcomings of the NCDE population estimation and monitoring methods have been critiqued by many including the attached report by Mattson (2019) who reviews and summarizes these.

There is no scientific basis for the NCDE Grizzly Bear Conservation Strategy (USFWS 2018) and Draft Plan standard of a 90% chance of not falling below 800. The accepted scientific standard is a 95% confidence interval of population persistence over some discrete timeframe, which for grizzly bears is several hundred years. The current population estimate for the NCDE is $\approx 1,100$. The Draft Plan would allow a 27% decline in the population before any management response would be implemented by U.S. Fish & Wildlife Service and Montana Department of Fish, Wildlife & Parks (FWPs) to halt the decline. For example, the graphic below from Mattson (2019b) shows that a population of 800 has a 59% probability of extinction.



Again, on page 47 the Draft Plan states:

If the probability of that population remaining over 800 (within the DMA) falls below 90%, hunting would cease and would not resume until the probability is 90% or greater.

This indicates that a population of 800 appears to be the goal rather than the floor with hunting as a major driver of population decline in addition to all the current sources of human-caused and related mortality. At that point the population could fall into a catastrophic decline or Extinction Vortex that cannot be reversed by management action. It is the opposite of the precautionary principle that applies to management of rare, threatened and endangered species. A population of 800 of any species is a very small number and very vulnerable.

Conservative estimates of grizzly bear population size necessary for viability in a single population or metapopulation over several hundred years is at least 2,000 (Metzgar and Bader 1992) and may be as many as 5,000 (Allendorf and Ryman 2002, 2017). Allendorf et al. (2019) estimate that 2,500-3,000 is an appropriate goal for a demographically and genetically connected metapopulation of grizzly bears in the Northern Rockies in the five recovery areas and habitat connectivity areas.

O'Grady et al. (2006) found that inbreeding depression as measured by lethal equivalents (LE) is much greater in wild populations ($LE \approx 12$) than it is in captive populations ($LE \approx 4$). This can lead to the Extinction Vortex as shown below.

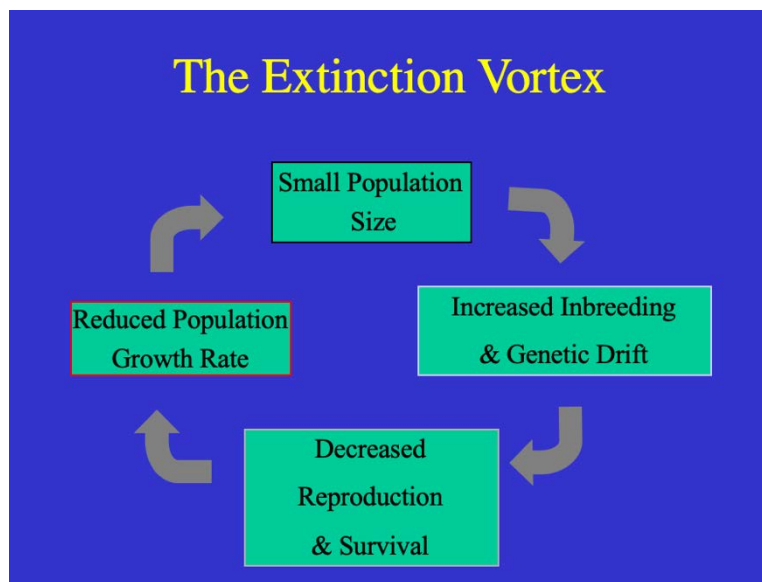


Figure 1. Graphic courtesy Fred Allendorf.

The Conservation Strategy for Grizzly Bear in the Greater Yellowstone Ecosystem (U.S. Forest Service et al. 2016) Demographic Criterion 1 and the Draft Plan is: *Maintaining at least 500 bears in the GYE*. As with the NCDE standard, the standard for GYE allows for a drastic reduction in population size of $\approx 33\%$ before remedial action would be taken. Moreover, the

Draft Plan admits it only considers grizzly bear population viability for ≤ 100 years. This is far too short a time period for a species with a generational time of approximately 10-15 years (Kamath et al. 2015). Are 500 bears over 100 years enough to avoid the effects of inbreeding depression? The following graphic shows that at 200 years with LE6 chances of population persistence (survival) drops to 50%. With LE12 this goes down to about 10%.

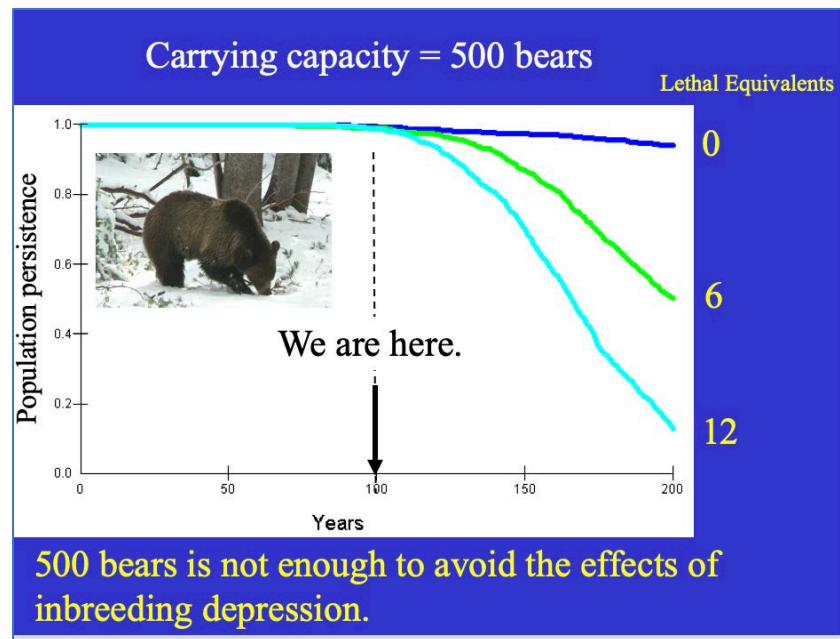


Figure 2. Courtesy of Fred Allendorf.

This information applies to inbreeding effects. There are other risks to smaller populations from events such as prolonged drought, food crop failure and fires. There are also direct effects from human caused mortality from poaching, habitat loss and more. And now disease is added to the mix. Highly contagious, transmissible disease has been documented in NCDE grizzly bears by FWPs:

Three juvenile grizzly bears tested positive for highly pathogenic avian influenza (HPAI) virus this fall. The three bears, one near Augusta, one near Dupuyer, and another near Kalispell, were observed to be in poor condition and exhibited disorientation and partial blindness, among other neurological issues. They were euthanized due to their sickness and poor condition. These were the first documented cases of HPAI in grizzly bears. A fox and a skunk in Montana also tested positive for HPAI last year, and the virus has been found in raccoons, black bears and even a coyote in other states and countries.

"We suspect these mammals probably get the virus from consuming infected birds," said FWP Wildlife Veterinarian Jennifer Ramsey. (FWPs press release January 2023.)

This new source of grizzly bear mortality must be analyzed and mitigated and is another reason the Draft Plan must be withdrawn and redone.

Methods for Calculating Population Growth

Mattson (2019) provides an extensive critique of methods and software used for estimating population size in the NCDE. These findings are summarized below.

- ❖ Estimates of population growth for the Northern Continental Divide Ecosystem (NCDE) grizzly bear population are entirely retrospective and, with passage of time, tethered to increasingly aged and irrelevant data that thereby make these estimates progressively more insensitive to current population trend.
- ❖ Deficiencies in models and software (i.e., RISKMAN) being used by government biologists are compounded by problems with how population growth is being simulated, resulting in substantial unacknowledged risks of over-harvest engendered by methods being proposed by the Service for management of grizzly bear mortality.
- ❖ There is no credible basis for estimating current population size or recent growth rate for the NCDE grizzly bear population, and therefore no credible input into calculations that would presumably yield estimates of allowable mortality.
- ❖ Increases in grizzly bear distribution were uncoupled from increases in population size during the 1980s-2004 and 2009-2014 in the NCDE. Distribution increased by 3-4-fold more during these periods relative to any probable increases in numbers of bears, largely because of changes in habitat, food availability, and diet.
- ❖ The roles of habitat, food availability, and diet in driving changes in population distribution are unacknowledged by the Service, which fatally compromises any government analysis of distributional dynamics for the NCDE grizzly bear population.
- ❖ When adjusted to correct for much lower odds of detection compared to other human-causes, poaching emerges as the most important reason why adult grizzly bears die in the NCDE (roughly 30% of all deaths), in part driven by the extent of road systems in landscapes with industrial-scale logging.
- ❖ Systems of secondary or industrial roads are extensive and dense in western portions of the NCDE, where proportionately much more land is devoted to timber production. As a result, management of human access along road systems is an important management issue in western parts of the NCDE, with ramifications for recovery of the entire NCDE grizzly bear population.
- ❖ Source-sink structures are an important feature of the NCDE grizzly bear population, especially in simulating population dynamics, managing grizzly bear mortality, and forecasting and addressing causes of mortality.
- ❖ The Service has not seriously addressed the inter-related issues of source-sink population structure and fragmentation in either its planning for or oversight management of the NCDE grizzly bear population. Both features have been altogether neglected in analyses and planning undertaken by the state of Montana.
- ❖ Projected climate change will likely result in loss of much of the berry-producing shrubs in most places, with resulting severe consequences for grizzly bears in portions of the NCDE where berries currently comprise a critical part of the bear diet.
- ❖ Projected climate change will almost certainly cause major changes in vegetation composition, directly because of changing weather norms and extremes and indirectly because of increased frequency and extent of wildfires. Avalanche chutes and habitats that support huckleberry will very likely decline.
- ❖ Human populations and the extent of the human infrastructure will almost certainly increase, with related impacts on grizzly bears, especially in the Flathead and Mission Valleys and the environs of Missoula.
- ❖ The Service has failed to meaningfully assess foreseeable changes in habitats, foods, and mortality risks for NCDE grizzly bears, and thereby does not meaningfully address these changes in any planning or management.
- ❖ Climate warming is underway in the NCDE and will almost certainly accelerate during the next 50 years. Even though forecasts for precipitation are more variable, it is almost certain that any increases will be offset by warmer temperatures to produce more frequent and severe late summer and fall droughts.
- ❖ Even more problematic, the Service has failed to account for and capitalize on the ample potential suitable but unoccupied grizzly bear habitat in the Northern Rockies. If considered, this unrealized potential is the basis for robust regional recovery in the form of a single contiguous grizzly bear population of near 3,000 individuals, with the Heart of the Grizzly Bear Nation key to achieving this potential.

Figure 3. Graphic courtesy of David Mattson.

Senescence

There are other shortfalls in the methods that FWP's has used. These include the issue of senescence, where bears live beyond their reproductive capacity. The age used for senescence is important to calculations of estimates for effective population size (N_e). Overestimating this age beyond previous scientific reports inflates estimates for N_e .

In the Conservation Strategy senescence in adult females (the end of reproductive ability) is set at 28 years when the oldest observed female with a litter of cubs-of-the-year was 26 and there was no indication the cubs survived to adulthood. In fact, in areas with high human presence, very few female grizzly bears live to age 25. Schwartz, et al. (2003) found rapid senescence after age 25 is not that important because few individuals survive that long. Of Schwartz, et al.'s sample size ($n = 4,726$) $\approx 10\%$ were age ≥ 20 and only 2.1% were ≥ 25 years. They found *"Our results conform to senescence theory and suggest that female age structure in brown bear populations is considerably younger than would be expected in the absence of modern man."*

Doak & Cutler (2014) detected a similar issue with modeling of grizzly bear vital rates in the Yellowstone ecosystem where studies assumed no reproductive or survival senescence occurred until age 30. In other models, researchers used values of 20, 20.5, 21.5 and 23.

Taken in sum, these biases in methods and errors of extrapolation undermine confidence in the FWP's population estimates and estimated population growth rates and trends. It's doubtful the population in the PCA and DMA is actually at K , as McClellan (1994:15) wrote: *"In reality however, human influences may rarely permit brown bear populations from attaining these levels."* The only possible exception in the NCDE is inside Glacier National Park, where hunting is not allowed, mortality is limited and most of the Park is within secure core habitat more than 500m from an open road.

Occupancy Methods and Goals

The Draft Plan on page 6 states: *"FWP's Preferred Alternative does not manage for grizzly bear presence outside of core areas, where the likelihood of conflict is elevated and legitimate concerns about human safety become the single highest priority."*

This is unacceptable. The NCDE Conservation Strategy, a host of top scientists and the recommendations of the Grizzly Bear Advisory Council all call for connectivity through habitat between the core recovery zones.

In regards to occupancy requirements within the NCDE DMA the Draft Plan on page 47 states:

a) Maintain a well-distributed grizzly population within the NCDE DMA; specifically, that females with dependent offspring will be documented as present in at least 21 of the 23 bear management units (BMUs) and six of the seven occupancy units will be documented at least every six years. Adherence to this objective will be evaluated by monitoring the presence of females with offspring (cubs, yearlings, or two-year-olds) within defined geographic units of the NCDE.

This is inadequate for maintaining demographic distribution and effective population (N_e) distribution and demographic and genetic connectivity. For one, in the six Occupancy Areas in Zone 1 just 6 of 7 have to be occupied just once every six years. The standard for Zone 1 is

“continual occupancy by females with cubs.” Managing for this low level of female/cub occurrence in Zone 1 does not require continual occupancy, rather it allows for sporadic occupancy which not only affects the DMA core population by limiting production to the PCA, it prevents expansion of the effective distribution area and movement of female grizzly bears into connectivity habitats between the DMAs and Recovery Areas.

Likewise, achieving presence of female/cub groups in 21 of 23 BMUs at least once every six years is a very weak standard. It is also biased in that a collared female grizzly bear could spend just a fraction of time and a fraction of her life range within an adjacent BMU and be counted towards the occupancy requirements for two different BMUs. This can lead to overcounting and is not a conservative method of documenting and meeting the distribution requirements for females with cubs.

The Integrated Patch Occupancy Model (iPOM) should not be applied to grizzly bears. This method as applied to wolves in Montana has been soundly criticized for leading to overestimates of population size (Creel 2022).

Bitterroot Ecosystem

After a portion of the Bitterroot Ecosystem was designated as an evaluation area in the Draft 1982 Grizzly Bear Recovery Plan, a portion of the Bitterroot Ecosystem was formally designated as a Recovery Area in the 1993 Grizzly Bear Recovery Plan (U.S. Fish & Wildlife Service 1993). The USFWS’s most recent Five-Year Status Review (2021) regarding grizzly bear recovery declared the grizzly bear in the lower 48 States *“remains likely to become in danger of extinction within the foreseeable future throughout all of its range.”* It also acknowledges that viability of the grizzly bear population as a whole *“only increases under the two optimistic future scenarios, which rely on increases in conservation efforts such that the Bitterroot Ecosystem and North Cascades support resilient populations.”* In other words, grizzly recovery in the Bitterroot Ecosystem is a lynchpin to achieving a long-term, sustainable, viable grizzly population in the entire lower 48 states.

Through the Conservation Strategy it is the policy of FWP’s, U.S. Fish & Wildlife Service, U.S. Forest Service, Bureau of Land Management and the Interagency Grizzly Bear Committee to encourage connectivity between Recovery Areas and DMAs, including natural immigration into the Bitterroot Recovery Area.

The Draft Plan states, *“Two Demographic Connectivity Areas (DCAs) are intended to provide sufficient security for female grizzly bear occupancy, potentially providing a demographic “stepping stone” from the NCDE to the CYE (via the Salish DCA) and to the Bitterroot Ecosystem (via the Ninemile DCA).”* Also, *“...in order for grizzly bear recovery to occur in the Bitterroot area, additional demographic connectivity from other populations, particularly for female bears who are unlikely to travel as widely as males, will be required.”*

In addition to the actions outlined below for facilitating natural movements of grizzly bears into the Bitterroot Ecosystem there are actions specific to the Bitterroot region within Montana. These include using accurate information. The Draft Plan inaccurately states the status of verified grizzly bears returning naturally to the Bitterroot Ecosystem not only by using outdated maps when maps from 2022 are widely available, but by making an unsupported statement about potential resident grizzly bears. Page 81 of the Draft Plan states: *“Thus far, apparently these animals have left the area in one of three ways: they have naturally returned to their place of origin; they have been moved by management agencies; or they have been killed by humans.”* The Draft Plan does not offer one shred of evidence for this statement. How is it known that they left? Areas adjacent and within the Recovery Area are within the U.S. Fish & Wildlife Service May Be Present Area. It’s at least equally plausible that they stayed and have not been detected again in this heavily forested, vast remote region where detection of bears is minimal.

As stated above, the Draft Plan uses old maps and data. Newer maps show many more verified observations of grizzly bears on both sides of the Bitterroot River and throughout the Sapphire Range.

As described in the Recreation Impacts section, there need to be comprehensive food storage requirements and facilities throughout the BE. This is far from complete and includes state managed lands and recreation facilities.

FWPs has hired a bear manager dedicated to the Bitterroot. This is a step in the right direction. However, the Bitterroot watershed is a very large area with many sanitation and attractant challenges and we encourage the FWP’s to invest in hiring an additional bear manager so that there can be a north zone manager and a south zone manager with an overlap area for quickest response. Increasing funding support for citizen efforts is also important. Conflict prevention and reduction is a central element in restoring grizzly bears to the BE where grizzly bears are already present and where education and conflict prevention efforts must be accelerated.

Cabinet-Yaak Ecosystem

The Draft Plan is flawed in its approach for maintaining viable grizzly populations by promoting isolated bear populations with an intolerance for interconnectivity of core populations. The Draft Plan’s priority focus should remain recovering the isolated grizzly bear population within the Cabinet-Yaak Ecosystem and grizzly populations throughout Montana by protecting core habitat and building a public and private land corridor-scape that allows bears to move unmolested from core population to core population.

In the CYE, the USFWS counted 54 grizzlies in 2018 (Daily Montanan 1/15/23) 50 in 2019, 56 in 2020 (Kasworm et al. 2021) and an estimated 59 bears in 2021. The actual count for 2021, using capture, collared individuals, DNA sampling, photos, and credible observations puts the

count much lower with a minimum count of 45 individual grizzly bears alive in the CYE at some point in 2020. (Kasworm et al. 2021). This would denote a population on the decline, down nearly 25% in 4 years and well below effective population numbers. The Yaak grizzly bear subpopulation is North America's smallest, most vulnerable grizzly bear population, with just 25-30 bears and only a handful of them females in their reproductive years, putting the Yaak's grizzly population at high risk of extinction. Connectivity of the CYE to the NCDE is imperative. The Cabinet-Yaak population has less than 50 bears split between the two subpopulations and is dependent on the voluntary movement of bears from the NCDE if populations are ever to reach self-sustaining numbers. Known grizzly bear mortality in the CYE is likely underestimated due to unreported mortality. Independent modeling shows that if the Yaak loses one adult female grizzly every other year, the population will be extinct in fewer than 20 years.

The Cabinet-Yaak Ecosystem is fragmented into two sub-ecosystems with little to no interbreeding, the Cabinet Ecosystem south of Highway 2 and the Yaak Ecosystem to the north of Highway 2. There is very little documented movement between the two subpopulations. The Yaak grizzly bear population, numbering fewer than 30 bears, is the most endangered grizzly population in North America and has met qualifications to be up-listed from threatened to endangered status under the ESA (Kendall et al.) The Yaak grizzly population cannot survive without immigration; it lacks genetic self-sufficiency. A DNA study (Kendall et al.) concluded grizzly bears in the Cabinet-Yaak Ecosystem, due to its small population, isolation, and inbreeding, demonstrate the need for comprehensive grizzly management to support population growth, and increase connectivity with other grizzly populations.

The Draft Plan recognizes the CYE is susceptible to the short-term inbreeding impacts of an N_e under 50, putting the Yaak grizzly population at high risk of extinction. The most important evolutionary force necessary to offset dwindling population numbers and increase the effective population of grizzly bears in the CYE is migration. Migration will increase the number of individual grizzly bears driving ecological processes and increase the number of potential parents adding to the evolutionary viability of the population (Waples 2022). This has been attempted with limited success in the Cabinet subpopulation through augmentation with translocated bears. Natural migration should be prioritized, not merely tolerated.

All grizzly bears, regardless of their location in the state of Montana are fundamentally contributing, and will continue to contribute, to the persistence of the species throughout the state of Montana. Population connectivity is a fundamental principle of conservation, and it is vital to the survival of the Cabinet/Yaak grizzly bear population. In addition to managing for connectivity, allowing bears to travel unmolested from core population to core population, first and foremost healthy and secure core habitat must be retained and protected from the management practices of other state and federal agencies and from encroaching human use. For example, the high use component of the Pacific Northwest Trail will result in management agencies being mandated to close roads in the CYE currently utilized for various management

activities. The resulting dispersal of grizzly bears out of these areas previously designated as core habitat will place those dispersing grizzlies at higher risk of mortality in transition zones and will also create disruptions to management plans for all other resources.

Both the long-term survival of bears in each of the designated biogeographically isolated Grizzly Bear Recovery Zones, and the overall recovery of grizzly bears in the Yaak Valley is dependent on protecting and interconnecting the unnaturally isolated islands of core grizzly habitat. All grizzly bears living inside and outside of core recovery areas are potential explorer bears and need to live in, and move through, not just federally designated core recovery zones but also the areas between this core habitat. Their presence in connectivity areas must not just be tolerated, but encouraged. Genetic connectivity and subsequent species viability is dependent on allowing bears to move throughout the state. This includes moving both west from the NCDE to the CYE and moving east from the NCDE into the historic range in the plains of eastern Montana. There is suitable protected habitat located in east central Montana where grizzly presence can contribute to healthy ecosystem function. The Plan should not place diminished importance on the long-term persistence of grizzly bears due their direction of travel.

In response to impacts to food sources related to climate change, explorer bears must be allowed to disperse unmolested outside of core areas between established recovery zones in search of food and potential mates. For this to occur, public education is of the utmost importance to facilitate security of man-made attractants that lead to conflict. Increased public awareness can mitigate conflict and increase social tolerance. This is key to facilitating connectivity. The CYE depends on it. A new study (Newmark et al. 2023) found that enhancing ecological connectivity would not only increase population size for mammals like grizzly bears, but also allow species to shift their geographic ranges more readily in response to climate change.

Grizzly bears in the Cabinet/Yaak Ecosystem are at increased risk of mortality due to management practices for other species. These practices include hound hunting of black bears and wolf trapping using snares, traps, and bait. Wolf trapping season is consistently open in CYE grizzly territory while grizzly bears are still active. Bears can be active outside the den during winter months putting them at significant risk of death or maiming.

Grizzly bear recovery in the CYE is further complicated by laws recently passed by the Montana legislature. Laws passed in 2021 include SB98 that allows *anyone* to shoot a grizzly bear that they subjectively feel is threatening to kill a person or livestock, HB224 allows the use of neck snares to kill wolves that will most definitely have an impact on non-target species including grizzly bears, HB468 reinstated the use of hounds to hunt black bear, although not permitted in the CYE, this law impacts migrating grizzly bears both through stress displacement and mistaken identity killing, SB314 allows the use of bait around wolf traps and wolf snares indiscriminately attracting and injuring multiple species including grizzly bears and HB225 extends wolf trapping and snaring seasons into times when grizzly bears are outside of their dens. All of these laws further imperil the CYE grizzly population. In 2023, two bills being introduced, SB85 and

another bill being drafted to further allow for grizzly bear take in defense of livestock (LC0925) will stifle if not completely inhibit dispersion of explorer bears whose movement is imperative to increase the effective population of imperiled populations like the CYE. All these laws, enacted by a scientifically deficient legislature, preclude scientific management of wildlife and pose serious risk to CYE bears and any bear dispersing out of core habitat in Montana. The Plan must explicitly state that these laws will not be implemented in areas occupied by grizzly bears or anywhere grizzly bears may be present due to the inherent risk they pose to population viability.

Designation and enforcement of sufficient core habitat must be the paramount management priority if state agencies are serious about recovering grizzly populations in Montana; from this point, recovery, natural dispersal into and through safe habitat will proceed naturally.

In addition to threats caused by climate change and habitat loss impacting grizzlies in the CYE, we are concerned that the Draft Plan's limited acceptance of grizzlies outside of core recovery areas will impede grizzly migration into the CYE and will interact cumulatively with other projects like the Pacific Northwest Trail (PNT) and core habitat loss in the Kootenai National Forest, resulting from clear cuts in the Black Ram, Pleasant Pheasant and Knotty Pine project areas. All of these projects will further degrade dwindling grizzly core habitat and further impede recovery.

Threats to the Cabinet-Yaak grizzly population are compounded by the intrusion of a high-volume hiking trail through core grizzly bear habitat. The proposed Pacific Northwest Trail route intrudes into formerly secure high-elevation, prime grizzly bear habitat in the Yaak portion of the CYE. Clearly there is the potential for grizzly bear displacement and/or human conflict along the proposed trail route that will result in bear mortality. The PNT, as proposed, unlike other long distance thru-hike trails, runs east and west versus north and south and spans a narrow range of latitudes, resulting in a shorter, more compressed season for thru-hiking. This season, roughly mid-June to mid-September, is congruent with high levels of grizzly bear activity in the Yaak ecosystem.

Most recently, a study out of Washington State University concluded that human presence exerts complex effects on the ecology of species, and fear of humans can profoundly alter wildlife communities. A peer reviewed study (Sytsma et al. 2022) has shown that even short-term disturbance by low human presence can impact wildlife causing them to flee an area or disrupt foraging behavior. Long term impacts noted are decreased reproduction, increased stress and spatial and temporal displacement. Large mammals, including grizzly bears, are noted as species of special concern due to their large spatial requirements, low population densities and low birth rates. In the Yaak ecosystem, where habitat is extremely small and limited, there are no other suitable habitats to be displaced into, from such season-long disturbances.

All of these impacts, climate change, logging and recreation have cumulative effects on the CYE grizzly population. Loss of habitat due to human encroachment is displacing wildlife at record

pace. There remain but few wild places like the Yaak Valley for wildlife like grizzly bears to thrive. Suitable secure grizzly habitat away from population centers linked with enhanced connectivity corridors must be retained and prioritized for grizzly recovery.

For bears in the CYE to recover it is imperative that FWP manage *for* bear presence outside of recovery zones. Population connectivity should be the fundamental principle guiding management policy focusing on recovery. FWP must establish and maintain a management focus on establishing and sustaining migration corridors allowing natural augmentation of the Yaak grizzly bear population.

Habitat Connectivity

Many models show that linking isolated populations with connective habitat can extend the probability of persistence for grizzly bears (Boyce et al. 2001). Servheen, et al. (2001) wrote: *“Boyce, et al. (2001) have demonstrated the value of multiple populations with some dispersal between them to the survival of the grizzly bear in the Northern Rockies.”* Newmark, et al. (2023) found that linking Glacier and Yellowstone National Parks would extend medium to large species persistence time by 4.3X.

The State of Montana has unique responsibilities for maintaining and restoring habitat connectivity. The connectivity areas between the four recovery areas are located all or in part within Montana. The Draft Plan correctly identifies the need for population connectivity but does not do enough to identify specific steps to protect the demographic and genetic connectivity habitats. And even worse, calls for purposely managing grizzly bears at low densities and suppressing bear numbers in connectivity areas. At page 8 the Draft Plan states: *“Role of grizzly bears in Montana - Between core populations, FWP would manage for a significantly lower density of grizzly bears to provide opportunities for connectivity.”* This makes no sense.

Connectivity areas are not just linear corridors on a map. Connectivity is measured by landscape permeability or the ability of animals to move across the landscape with minimal disturbance and mortality risk. All of the lands between the Recovery Areas have potential value as connective habitat.

All Montana State lands within identified connectivity areas must be prioritized for habitat protection consistent with demographic connectivity. For example, there are thousands of acres of state lands in the Fish Creek Wildlife Management Area, much of which is located within the Ninemile Demographic Connectivity Area designated as part of the NCDE Conservation Strategy. The Blackfoot-Clearwater Wildlife Management Area is another example of grizzly bear habitat that also serves as connective habitat between the NCDE and Sapphire Mountains. And tens of thousands of acres of lands providing connective habitat between the NCDE and the CYE have been put into conservation easements. These lands should have no additional road construction allowed and road reclamation should be undertaken to achieve the State goal for

road density on State managed lands of $\leq 1\text{mi}/\text{mi}^2$ and less wherever possible. Bader and Sieracki (2022) outline prerequisites for the demographic model of connectivity:

“Denning Habitat and Secure Core within Dispersal Distances— . The availability of denning habitats within secure core areas is a fundamental requirement of the demographic model. These are areas where females can survive and raise offspring who become a source of dispersals.

We suggest Bear Management Units (BMUs) be identified within key connectivity habitats with standards to maintain all currently secure core habitat. Standards based upon scientific data maintained 68% of a BMU in secure core habitat (USFS 1995). The secure core areas should not shift as this disrupts female Grizzly Bears who learn that areas are secure and pass a significant portion of the maternal home range to their female offspring so that sudden shifts in security conditions would not be conducive to the demographic model.

In connectivity habitats, the larger secure areas should be spatially distributed within known dispersal distances for female Grizzly Bears (Mattson et al. 1996). From the dispersal information in Graves et al. (2014), Proctor et al. (2004) and McLellan and Hovey (2001) secure core areas from 0-10km apart might work for 64% and 74% of dispersing females, respectively with 0 representing females who do not disperse from their home ranges, while core from 20-30km apart might work for 22% and 19% of dispersing females, respectively. How Grizzly Bears might best move between and within secure core awaits a future analysis based on habitat quality, least-cost path analysis and circuit theory, as in Proctor et al. (2015).

(2) Highway Passage Structures—. Highway and rail transportation corridors are zones that fragment Grizzly Bear populations into isolated demographic units (Proctor et al. 2002). The two biggest obstacles to female Grizzly Bear dispersal in the study area are the Interstate 90 corridor and US Highway 93 from Whitefish to Darby, Montana. While a female grizzly with cubs south of I-90 has been documented (Jonkel 2021) the big issue is the number of dispersing bears and the number that choose to disperse plus the limited number of crossing structures where bears can safely cross highways. These are essential to successful demographic dispersion of Grizzly Bears into historic habitats (Ford et al. 2017). Having “multiple shots on goal” would provide a higher likelihood of success.

As the State wildlife management agency, FWPs must proactively comment on proposals within connectivity areas from the U.S. Forest Service, Bureau of Land Management and other management agencies and recommend actions to reduce conflicts with grizzly bears and their habitat including prohibiting new permanent road construction. FWPs must also work Montana Department of Transportation to increase funding support for identification of crossing areas and installation of crossing infrastructure.

FWPs should actively seek to enter into cooperative agreements that reduce open road densities in connectivity habitats and consult with private landowners on road management on their lands.

A central component of enhancing the effectiveness of connectivity habitat is education and information on practices that reduce the potential for bear-human conflicts including securing attractants. FWP needs to continue increasing its funding and efforts in this direction.

Denning Habitat in Connectivity Areas

The Draft Plan fails to account for denning habitats outside the Recovery Zones and within connective habitats. Bader and Sieracki (2022) mapped denning habitats in all areas of Montana west of the Continental

Divide (see map figure) and found sufficient habitats to support residential occupancy by female grizzly bears and their cubs to provide “demographic connectivity” and “stepping stones” of secure habitats to facilitate natural immigration to the Bitterroot ecosystem and the Cabinet-Yaak. The same type of analysis should be done for areas east of the Continental Divide and connectivity between the NCDE and GYE.

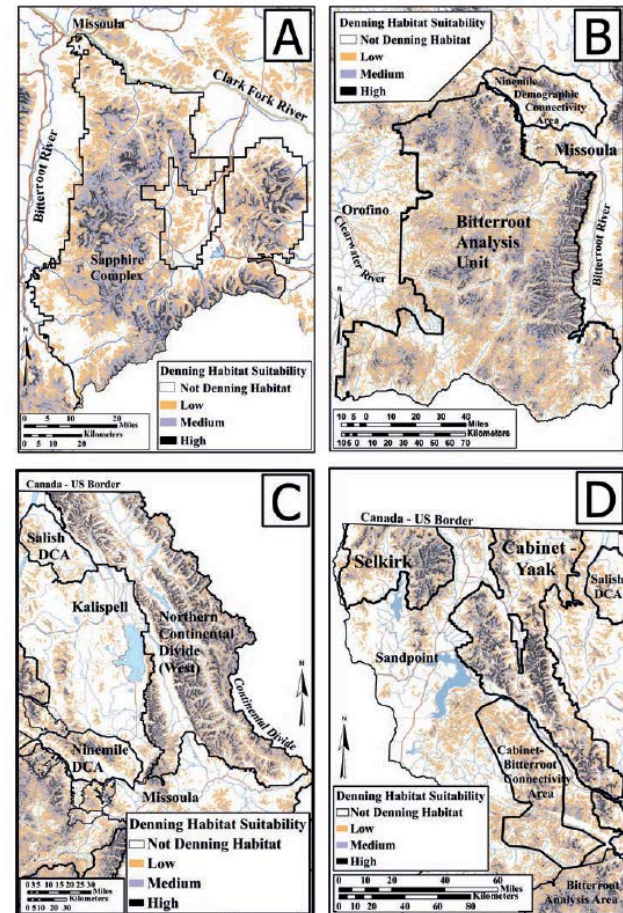


FIGURE 8. Denning suitability results for the analysis units showing the selection for steep slopes, higher elevation, and distance from open roads and water bodies. Medium- and high-suitability habitats are of the most direct importance to demographic connectivity and management.

Mortality Accounting in Connectivity Areas

It is intuitive that grizzly bears would exist at lower densities outside the core recovery zones that have large National Parks, designated Wilderness and Inventoried Roadless Areas. Bader (2000b) was cited in the 2007 Grizzly Bear Management Plan for Western Montana as one of the papers used for its preparation. It was predicted that grizzly bear density in connectivity areas would be lower than what it is in core recovery zones due to low area/perimeter ratios resulting in more edge effects, lower habitat security and expected higher mortality rates due to roads and large areas of private lands.

However, 23 years later many of these factors are being mitigated through programs that increase public acceptance for having grizzly bears on the landscape. Education on coexistence and conflict prevention including sanitation and securing attractants using facilities or electric fencing and reducing open road densities on public and private lands improve security and lower mortality risk. Conservation easements and outright purchases are being accomplished by the State of Montana, land trusts and other entities.

The Draft Plan acknowledges that connective habitats will *intentionally* be managed for a lower density population meaning it would allow mortality through hunting and other lethal removals. This would certainly suppress the possibilities of successful demographic residential occupancy and genetic interchange and critically, natural immigration into the greater Bitterroot ecosystem. Moreover, a specific science-based estimate of sustainable mortality in Zone 2 and 3 areas is absolutely necessary. Biologically, in many areas even one mortality will be unsustainable.

Dr. Cecily Costello with FWPs (December 2022) said that the agency is considering removing emigrants who leave the DMA from the NCDE population estimate as they would a mortality. This should be done for both the NCDE and GYE because mortalities that occur outside the DMAs are not counted towards mortality calculations so that the bears are counted when they are born but are not subtracted when they die, skewing the population estimate upward. But once these bears have emigrated outside the DMAs, when they die they must be counted again as mortalities that occurred outside DMAs so that can be tracked with the same precision as those within the DMAs.

No Demographic Connectivity with Canadian Populations

The Draft Plan on page 78 overstates the level of actual connectivity between the NCDE grizzly bear population and those in Alberta and British Columbia focusing on isolated dispersals of males. The Draft Plan cites to information that heterozygosity levels in the NCDE are similar to those in Canada. We would not expect levels of heterozygosity to be lower in the NCDE yet as it has been about one generation since demographic isolation was detected. The NCDE has basically the same genetic signature as grizzly bears in the Cabinet-Yaak and Selkirk Mountains because until recently there was still connectivity north in Canada and the NCDE, CYE and SE have not been separated long enough (1-2 generations) to detect significant differences. Moreover, these grizzly bears are all a part of the remaining Clade 4 genetic lineage and will be very similar genetically. These measurements are not proof of connectivity, they are proof of similarity.

In fact, there is little to no demographic connectivity between isolated grizzly bear populations in the Rocky Mountains of Alberta and in British Columbia and populations have been fragmented by the Highway 3 and rail line transportation corridor and subdivision development. In light of

this fragmentation, the Province of British Columbia classified these border populations as “threatened.” There is no recent documented demographic connectivity between populations north of Highway 3 and those south including the NCDE.

On Page 79 the Draft Plan states: *“Efforts are currently underway to reduce the limitations placed on grizzly bear movement by Highway 3 (Proctor and Morehouse 2021). In turn, these southern Canadian populations, while affected by highways and development that constrict connectivity and facing conservation challenges of their own, are not **entirely** isolated genetically from populations further north.”* (emphasis added).

“Not entirely” is not very hopeful and not something that Montana and the U.S. Fish & Wildlife Service can count on and “currently underway” is admirable but is not an accomplishment with documented results. There is no authority to do or ensure anything in Canada and therefore conservation measures to protect grizzly bear viability must be accomplished on lands within the U.S.

The Draft Plan then contradicts itself again by stating it may be unrealistic to claim connectivity all the way to the Yukon. Attempting to claim connectivity with thousands of grizzly bears to the north is scientifically invalid at this time. Future hopes cannot be banked. The NCDE is effectively demographically isolated with numbers far below viability.

Canadian grizzly bear scientist Dr. Brian Horejsi (in Allendorf et al. 2019) concluded that: *“...it would be willfully negligent to state that Southwestern Alberta and Southeastern British Columbia contribute positively to the conservation of grizzly bears in the Northern Continental Divide Ecosystem in Montana.”*

Genetic Augmentation to GYE Using the NCDE as a Source Population

The Draft Plan for genetic augmentation seems like a ploy to get around the federal court ruling that the agencies must address the issue of genetic connectivity. This may have the effect of diminishing support for habitat protection in connectivity areas. The Court did not say how the agencies must do this, only that they must. Protecting demographic connectivity areas that fully connect the isolated recovery areas is a viable strategy already seeing results.

The analysis presented on potential “genetic augmentation to the GYE” fails to include a reference to perhaps the most important paper ever published on carnivore translocations, Miller et al. (1999). Therefore, the analysis fails to include several key issues.

Miller et al. (1999) wrote: *“The technical considerations of translocation are closely related to the biological questions. They include legal framework, fiscal and intellectual resources, monitoring capacity, goals of the translocation, logistic challenges, and organizational structure of decision making.”*

This paper is highly relevant to the proposal for genetic augmentation and their key considerations relevant to this proposal include:

1) *What are the prospects of new immigrants via unassisted movements?*

A-numerous biologists including Dr. Costello with FWPs have said that genetic connectivity between the NCDE and GYE is “not a matter of if but when.” The distribution area of the two populations has grown steadily closer and genetic interchange may well have already occurred. Grizzly bears are also being verified within and adjacent to the Bitterroot Ecosystem. The prospects of new immigrants via natural unassisted movements is quite good and there can be no justification for genetic augmentation at this time. The Draft Plan says that genetic diversity is not an urgent issue in the GYE and N_e has been increasing. So why the hurry?

2) *Have the causes of population decline or extirpation been eliminated?*

A-Many sources of unsustainable mortality have not been remediated in the GYE and the Draft Plan would allow mortality resulting in as much as a 33% decline. As to genetic diversity decline the Draft Plan in Appendix states: “*The rate of inbreeding has been very low (0.2% over 25 years), and no inbreeding effects have been detected. Additionally, effective population size has increased well above the level where short-term genetic effects would be expected...*”

3) *Is there sufficient protected habitat for the translocated animals to survive?*

A-At this time there might be but that is not assured over time. Recreational use, resorts, subdivisions and logging are bringing many new impacts to the landscape that grizzly bears depend on in the GYE.

4) *Are there suitable animals available that are surplus to the genetic and demographic needs of the source population?*

A-Legally and biologically, no. The NCDE population is threatened under the ESA and recent reports have documented systematic violations of the Conservation Strategy that are resulting in habitat loss, increased mortality and population decline. It must be demonstrated biologically that the NCDE can serve as a source of female grizzly bears for GYE genetic augmentation while simultaneously sourcing augmentation and reintroduction efforts in the CYE and North Cascades.

5) *How likely is the authority and funding for the project to be terminated for biological, political or economic reasons?*

A-An augmentation plan in British Columbia was recently shut down after the first grizzly bear being translocated died in route (Dr. G Mowat, Provincial Biologist, IGBC meeting, 12/6/22). Carnivore translocations can be controversial and subject to politics. State and federal administrations frequently change and funding priorities and programs change with them. When they do, valuable individuals from legally protected populations could get stranded and perhaps even killed when the project is terminated resulting in unnecessary waste of reproductive adults.

6) *How would translocations affect the legal status of the individuals?*

A-According to the Draft Plan grizzly bears that would be moved for genetic augmentation would not have legal protection under the ESA.

7) *Are the reintroduction and source areas far enough apart to overcome the homing instinct of grizzly bears?*

A-The NCDE and GYE are not far enough apart to overcome homing instinct which is very powerful in grizzly bears. *“Excessive movement from the release site is a major reason for low survival and poor reproductive rates of translocated carnivores.”* (Miller et al. 1999). To overcome this, minimum translocation distances should be > 241km (H Reynolds, pers. comm. in Bader 2000b). Several grizzly bears translocated to the Cabinet Mountains returned to the NCDE or were killed while doing so.

There are several key things that must occur for an attempted genetic augmentation to succeed. First, the bear has to stay there and not return due to homing instinct. Next it has to survive. Then it has to breed. Those offspring must also survive to reproductive age and themselves breed. Any interruption in the sequence results in failure. This is a weak chain compared to what has been described as the “imminent” occurrence of genetic interchange via natural movements.

At this time there is no need to begin a genetic augmentation program. Levels of heterozygosity in the GYE can be measured using DNA samples and natural genetic exchange using DNA samples can be documented and monitored over a period that is at least one generation of grizzly bears (10-15 years). If no such interchange has been documented after this time period, then genetic augmentation could be considered and its desirability determined by a panel of scientific experts, including geneticists.

The NCDE is a source population for natural emigrations to the GYE, CYE and Bitterroot ecosystems because the bears work it out on their own without unnatural interventions that require capturing, drugging and transporting bears long distances, which increases the risk of accidental mortality.

Road and High Use Trail Impacts on Grizzly Bear Habitat

Information that was available to FWP's includes research reviewed by Proctor, et al. (2019) showing grizzly bear population density is lower in areas with more than about 1mi/mi² open road density. The table below from Bader and Sieracki (2022) shows the impacts of open road density on grizzly bears. Even at 1mi/mi² grizzly den selection is reduced by 30%. The Draft Plan and the Conservation Strategy need to be amended to have the same road density and percent of secure core habitat standards throughout the DMA.

WINTER 2022

BADER AND SIERACKI: GRIZZLY BEAR DENNING AND CONNECTIVITY

221

TABLE 8. Road density impacts on Grizzly Bears. Sources: Boulanger and Stenhouse (2014); Pigeon and others (2014); Proctor and others (2019).

Road density (km/km ²)	Adult female survival rate	Population growth rate	Density bears/1000 km ²	Den selection probability
0	≈100%	Positive	30	N/A
0.6	95%	Static	≈ 30	70%
1.2	85%	Negative	10	30%
1.4	75%	Rapid decline	Lower	N/A
1.6	< 75%	Rapid decline	Lower	N/A
2.0	Lower	Rapid decline	Very low	≈ 0%

Figure 4. From: Bader and Sieracki 2022. Full citations in Literature Cited.

Page 11 of the Draft Plan states that FWP's "avoids open road densities > 1mi/mi² on lands it owns or manages." This needs to be changed to: "Open road density on state managed lands shall be ≤ 1mi/mi² and less wherever possible and there can be no net increase in total roads."

Another growing impact on habitat security are high-use non-motorized trails in Wilderness and roadless areas. Gunther (1990) documented significant displacement of grizzly bears away from high use recreation trails in Yellowstone National Park. The Flathead National Forest Plan allows parties up to 15 people with 35 head of stock within the Bob Marshall Wilderness and is expanding the number of Special Use Permits for outfitting and guiding, adding more use to high-use trails. FWP's, as a party to the Conservation Strategy must insist that high-use non-motorized trails be buffered 500m on either side as part of calculating the amount of secure core habitat in the NCDE as they previously were. Additional impacts from high use trails is discussed in the section on Recreation.

Habitat Monitoring

In addition to monitoring road densities and secure core habitat, there are several indices of habitat productivity and quantity that must be monitored in core population areas. For the NCDE, Mattson (2019) summarized these as shown below.

- ❖ Humans are responsible for roughly 90% of all adolescent and adult grizzly bear deaths in the Northern Continental Divide Ecosystem (NCDE). As a result, most bear deaths are dictated by the rate of encounter with humans (encounter frequency) and the likelihood that the encounter will turn lethal (encounter lethality).
- ❖ Frequency of encounters with people is partly dictated by sheer numbers of people, densities of road and trail access, numbers of human residences, and the nature of human activities. All of these human-related features warrant being monitored to inform grizzly bear conservation efforts.
- ❖ Frequency of encounters between bears and people is also dictated by the number and nature of attractants near where people are active, including unsecured garbage, bird feeders, dog food, beehives, small livestock (e.g., chickens), boneyards, and calving and lambing areas, among others. All of these human-associated features warrant being monitored.
- ❖ Productivity of the NCDE grizzly bear population is contingent on the abundance and distribution of high quality foods and the habitats that produce them. Availability of foods and habitats also determine, in part, the extent to which grizzlies spend time near people in search of food and resulting odds that they will be involved in conflicts with humans and end up dead.
- ❖ Known high-quality foods and habitats include shrubfields and other environments that produce huckleberries, buffaloberries, serviceberries, chokecherries, and hawthorn; alpine talus sites that host concentrations of army cutworm moths; avalanche chutes that produce abundant cow-parsonip and other preferred herbaceous foods—along with berry-producing shrubs; and mule deer, white-tailed deer, elk, and cattle populations. All of these foods and associated habitats warrant being monitored to inform grizzly bear management and conservation in the NCDE.

Figure 5. Graphic courtesy David Mattson.

Chickens in Grizzly Bear Habitat

The bears documented with HPAI may have had access to domestic chickens which in any case are a potential source of avian flu which has killed more than 90 million domestic poultry in 2022 alone and has spread to wild bird populations.

Chickens are also a separate category of mortality according to FWP and the U.S. Fish & Wildlife Service. Chicken-related grizzly bear mortality is now one of the major sources of mortality. The Draft Plan at page 58 shows the number of chickens in Montana more than tripled from 2010-2020 from < 400,000 to > 1,400,000. Chicken depredations were the second leading cause of management actions both inside and outside of the PCA.

Many of these are “hobby” operations within forested grizzly bear habitat involving a small number of chickens which are completely unprotected against grizzly bear predation. Once habituated to this food source, it produces elevated risks for bears and people.

The State of Montana can regulate livestock. If current authorities do not exist they can be promulgated. FWPs must work with the Legislature and the Fish & Wildlife Commission to develop limits and mandatory requirements for domestic chickens in grizzly bear habitat. The State can also allow counties to develop their own regulations. These include areas where chicken farming will not be allowed and regulations for other areas including electric fencing, permit fees and loss of permit for failure to comply.

Chickens are attracting grizzly bears into residential areas and pose a threat to human life and safety. For example, a woman was killed by a grizzly bear in Ovando and this grizzly bear had earlier raided a nearby unsecured chicken coop. The Draft Plan fails to adequately address this

critical issue. The failure to effectively mitigate this increasingly dangerous situation represents yet another inadequate regulatory mechanism.

Old Data

The Draft Plan and EIS rely on several pieces of information that are outdated and for which more recent data are widely available. One is the Grizzly Bear Distribution and May Be Present map and another is the verified outlier observation map. The maps in the Plan/EIS are from 2018. Much more recent information is available as the U.S. Fish & Wildlife Service has been publishing updated maps on an annual basis including 2022 and as shown in the map figure below literally the entire area covered by the Draft Plan is within the distribution and may be present areas.

The data on wood products on pages 58-59 are also from 2018 and outdated. Many National Forests have revised their Forest Plans and significantly increased the planned annual harvest as well as salvage and timber exchanged for goods and services.

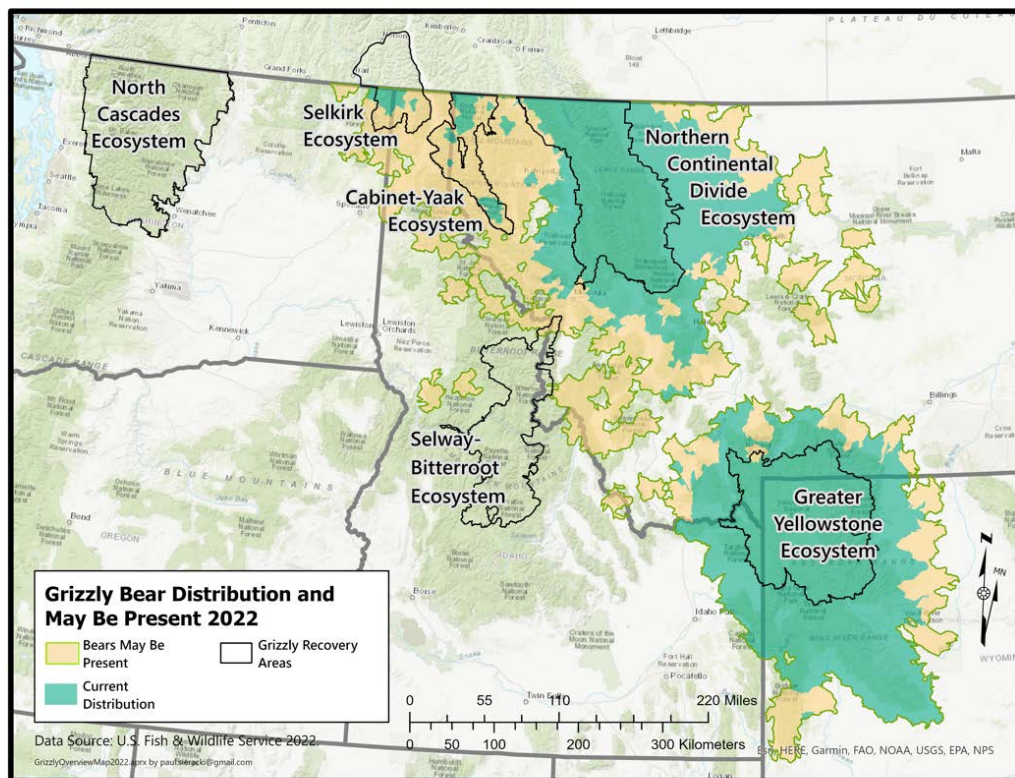


Figure 6. Grizzly Bear Distribution and May Be Present 2022. Source: U.S. Fish & Wildlife Service.

Hunting impacts

Generally, this section of our comment responds to the Draft Plan's statement that "*FWP would prepare for a conservative grizzly bear hunting season*" if grizzly bears are delisted. Draft Plan, page 10. We take issue with the myriad unscientific and unreasonable justifications that FWP has provided to support this proposal, and do not agree with establishment of a grizzly bear hunting season. The Draft Plan is a stunning display of FWP's lack of credibility regarding predator management. FWP has a duty to manage wildlife as part of the public trust, yet the Draft Plan makes clear that FWP intends to manage for a small group of special interests instead of grizzly bears and the public at large.

Contrary to FWP's statements throughout the hunting section of the Draft Plan, a grizzly bear hunt is unlikely to reduce conflicts and could make people less safe; a grizzly bear hunt is a trophy hunt, which most of the public is against; hunting grizzly bears is likely to lead to unsustainable female mortality; it will hamper the species' ability to recover, especially if allowed in connectivity zones; will not increase social tolerance; and will be an additive source of mortality.

To address issues that may arise when grizzlies, humans, and/or human property share a landscape, FWP should be prioritizing public education, coexistence via human adaptation, science, and the needs and wants of the majority of Montanans and others with a stake in the recovery of our grizzly bear population. FWP's preparation to establish a hunt upon delisting to allegedly solve these issues aptly demonstrates why Montana is not prepared to maintain a delisted population and does not and will not have adequate regulatory mechanisms in place should the bears lose their 'threatened' status.

I. Allowing a hunt will compromise the grizzly bear population because hunting mortality is additive to other sources of mortality.

"In no case would hunting compromise recovered populations." Draft Plan, page 10. To the contrary, establishing a hunt would be reckless, and would certainly compromise the population. Hunter-caused mortality will add to an already unsustainable gamut of mortality from other sources. And at least two potential results of a hunt—allowing hunting in connectivity corridors and hunters killing females—will be especially deleterious to the population's ability to recover and establish long-term viability.

Neither the Draft Plan nor the EIS address or analyze current levels of cumulative mortality, and both documents fail to address potential impacts of adding hunter-caused mortality. The 2021 Species Status Assessment for grizzly bears by the U.S. Fish and Wildlife Service reported that the main threats or stressors to grizzly bears and their recovery in the lower-48 states are currently (1) human-caused mortality (due to management removals, accidental killings, illegal killings, and mistaken identity kills); (2) motorized access; (3) livestock grazing allotments; (4)

developed recreational sites and recreational activities; (5) timber, energy, and mineral development; (6) private land development; (7) climate change; (8) loss of connectivity and poor genetic health; and (9) the loss of important food sources. Many of these stressors will worsen over time.

Human-caused mortality is already the primary stressor to grizzly bears—adding hunter-caused mortality would be unsustainable at best and catastrophic at worst. FWP should in no case establish a grizzly bear hunting season. FWP must thoroughly examine current cumulative mortality and predict cumulative mortality including a hunt. Cumulative mortality that accounts for predicted hunter-caused deaths would not come down only to numbers but would also include consequences from the intentional or unintentional death of females, death of bears in connectivity zones, and death of bears that spend most of their time within protected areas like National Parks, among others. The Plan’s current lack of analysis of cumulative mortality at present and with the additive impacts of hunting is unacceptable.

a. FWP must first account for the cumulative effects of all current sources of mortality, without a hunt.

The Draft Plan does not analyze several existing causes of mortality, an error the final Plan must remedy. First, the 2021 legislation liberalizing wolf hunting and trapping, and 2022/2023 wolf hunting and trapping regulations permitting baited wolf traps and snares across the landscape in many areas where grizzly bears are known to be present and at times when they are not in their dens place grizzly bears at considerable risk. The Draft Plan must analyze how increased risk and mortality caused by the legislation and regulations will contribute to cumulative mortality and how it affects the grizzly bear population. To reduce the risk, FWP should severely limit areas where and when wolf trapping, snaring, and hunting with bait is permitted (see section on Trapping).

Second, the final Plan must analyze mortality resulting from mistaken-identity kills, when hunters mistake grizzlies for black bears, not all of which are reported. FWP must consider how hound hunting for black bears affects grizzly bears. Grizzlies are also killed by hunters in Defense of Life incidents including when hunters return to carcasses or leave gut piles which attract bears and lead to future human-bear interactions, and by FWP or FWS after hunters surprise the bears who react to their detriment. To reduce at least some of these mortalities, FWP can take action to require all hunters to carry bear spray in the field, which studies show is an effective deterrent. See, e.g., Smith, et al. (2010).

The Draft Plan’s current analysis on existing contributors to cumulative mortality by human and other causes is effectively nonexistent, meaning it is impossible for FWP to adequately address how the additive source of hunting mortality would affect the population.

b. FWP must then account for the additive mortality of hunting and the secondary affects likely to result from a hunt.

Hunting mortality will be additive, rather than compensatory, to the pre-existing sources of mortality discussed above. Additionally, several potential consequences of a hunt could have outsized negative influences on the population overall, including female mortality, killing bears on the periphery of core areas like the NCDE, and hunting in connectivity zones and near National Park boundaries.

As documented by Bader (2000a) and Mattson (2020) since the end of legal hunting for grizzly bear in the NCDE, the spatial distribution of mortalities has shifted from the core to the periphery. See Figure 8. FWP has indicated that if there is a grizzly bear hunt it will be focused on the periphery. This is highly problematic as the bulk of mortalities are occurring on the periphery and these sources of mortality will continue, so any mortality from hunting will be additive rather than compensatory. These “edge effects” are drivers of extinction within protected areas (Woodroffe and Ginsberg 1998). They wrote: *“Such sinks will have the greatest impact on overall population dynamics in small reserves with high area:perimeter ratios and in species that range widely and therefore come into frequent contact with reserve borders.”* The FWP’s region 2 bear manager said recently that the *“NCDE really isn’t that big.”* (Missoulain 12/22).

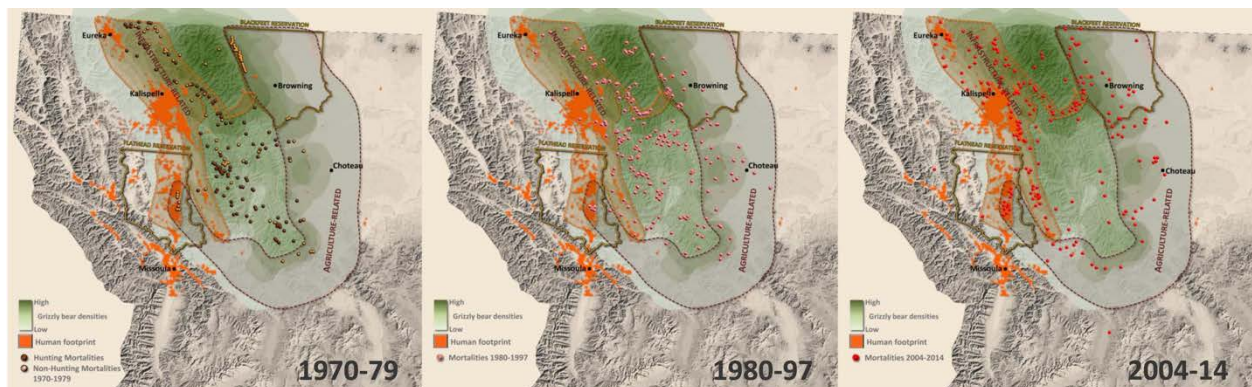


Figure 8. The Shift in the Spatial Distribution of Grizzly Bear Mortalities in the NCDE, 1979-2014. Following the cessation of hunting seasons in 1992 mortality has shifted to the periphery and this trend has continued through 2022. Graphic Courtesy David Mattson.

Hunting in or near National Park boundaries would also be problematic. The catastrophe that ensued after FWP and the Fish and Wildlife Commission removed wolf killing quotas north of Yellowstone in 2021 provides plenty of insight into what would happen if FWP allowed grizzly hunting in or near National Park boundaries. Like wolves habituated to people because they spend most of their lives within the confines of protected Park boundaries, grizzlies from Yellowstone and Glacier National Parks will also present easy targets, walking into slaughter. FWP cannot allow hunting in or near national park boundaries.

FWP must consider the effects of any hunting in connectivity zones. Generally, the crucial nature of ensuring grizzly bears can travel safely through connectivity zones is discussed in the section on Connectivity of this comment, and aptly demonstrates why allowing any hunting of bears in connectivity zones should not be allowed.

Hunting is likely to disrupt the sex structure of grizzly bear populations and lead to unsustainable female mortality. And even if FWP had regulations in place to limit or prohibit killing females,¹ hunters are unlikely to be able to differentiate them unless the female is clearly lactating or the bears stand up such that their genitals are visible. Killing females is problematic for myriad reasons. The Cabinet-Yaak 2021 annual grizzly report showed the significance of females, stating that a decline of female mortality between 2007-2021 was *“largely responsible for improving the population trend.”* Yet, the 2021 grizzly bear Species Status Assessment by the U.S. Fish and Wildlife Service reveals that the current levels of female grizzly bear mortality in the Cabinet-Yaak ecosystem are still at levels undermining recovery. A hunt would unduly put females at risk, harming populations like that in the CYE that are still not recovered.

Killing any females via hunting could have significant consequences. First, a female may have cubs that a hunter cannot see, which upon her death become orphaned and are almost certain to die, adding to mortality. Second, females of reproductive age are a “critical segment” in the population (Greer 1972). Killing one female is a major setback—because of their slow maturity, late age for first litter, and time between litters, each one plays a crucial role in the recovery and viability of the population. And killing females on recovery zone peripheries or in connectivity zones would be particularly problematic. They are slow to disperse across the landscape but female dispersal is essential for recovery. Mattson estimated that there are approximately 3 reproductive males for every reproductive female. Therefore, the loss of one reproductive female, especially in or near a linkage zone, could severely set back the establishment of a connected—and thus a recovered—population.

Even if FWP argued that the population could still recover if a small percentage of females are killed either intentionally or unintentionally, the Draft Plan makes clear that FWP will not be able to keep track of what percentage of females, and potentially males, are killed. The 1993 Recovery Plan provides that a very small percentage of females could be removed from the population and that population still grow and trend toward recovery. According to the recovery plan, “sustainable mortality” is the level of annual human-caused mortality that individual grizzly bear populations can sustain without declining; it is directly related to the number of

¹ See, e.g., the Tri-State Memorandum of Agreement Regarding the Management, Genetic Health, and Allocation of Discretionary Mortality of Grizzly Bears in the Greater Yellowstone Ecosystem (provided in the Plan, Appendix H) (“The Parties will prohibit hunting of females accompanied by young, and young accompanied by females[.]”).

females with cubs. The recovery plan stated that sustainable mortality for a subpopulation is no more than four percent, with no more than 30 percent of that being females.

The Draft Plan, however, effectively states that FWP will not have the data to determine sustainable mortality limits. The Draft Plan says that it is not yet *“feasible to estimate grizzly bear abundance or trends in any of the Occupied core areas.”* Draft Plan, page 6. It’s incredibly concerning that FWP currently operates under the assumption that it is not feasible to estimate abundance or trends *in* core areas. And even if this was a mistake and it should say *between* core areas, the Plan needs to detail how FWP will stay within sustainable mortality limits considering all causes of mortality. How can FWP do this without abundance estimates both within recovery zones and between them? How does FWP plan to account for female mortality thresholds? Additionally, if FWP allows hunting near DMA boundaries, how does FWP plan to keep track of whether any females killed in those border zones came from within the boundaries or outside of them? FWP cannot establish a hunt that would not compromise the grizzly bear population.

II. Hunting is unlikely to reduce conflicts.

“Would hunting grizzly bears reduce human-bear conflict?” Draft Plan, page 105.

There are myriad issues with this section of the Draft Plan. The lack of empirical evidence to support this entire section and FWP’s ignorance of the evidence contradicting it is irresponsible. FWP begins with the idea that because ARM 12.9.1401 (1977) considered sport hunting to be the “most desirable method” for managing the grizzly bear population, reducing depredations, and protecting humans from attacks, then it is a *“reasonable thought”* that this still applies today. Draft Plan, page 105. FWP then states that it is *“not aware of definitive research”* to support this conclusion. Importantly, numerous studies published since 1977 have shown that a sport hunt is not an effective grizzly bear management strategy and does not reduce conflicts. Indeed, ample scientific literature demonstrates the opposite. FWP then provides *“four aspects of the situation”* deserving consideration for the possibility that a hunt could reduce conflicts, while acknowledging that only one enjoys the support of any empirical data. Draft Plan, page 106. We take these in turn after providing the relevant scientific literature the Draft Plan left out, but which must be considered in the final plan.

a. Relevant scientific literature shows that hunting does not reduce conflicts.

Several studies focused on the effects of hunting various bear species consistently determined that hunting did not reduce conflicts (Strong 2020). *See* Artelle et al. 2016 (grizzly bears in British Columbia); Sagør et al. 1997 (brown bears in Norway); Treves et al. 2010 (American black bears in Wisconsin and Ontario); Huygens et al. 2004 (Asiatic black bears in Japan). Artelle et al. suggested that hunting did not reduce conflicts because hunter-killed bears were usually not the same bears involved in conflicts, as they tended to live farther from humans and were older than conflict bears.

Treves et al. and Huygens et al. suggested that hunting did not reduce conflicts because after hunting seasons, new bears took the place of killed bears, causing new conflicts. The conclusions of Treves et al. and Huygens et al. also resonate with the idea of ecological traps, which Mattson (2020) defines as “*areas where bears are attracted into lethal environments by the free availability of anthropogenic foods.*” In other words, even when conflict bears are successfully targeted and killed either by hunters (which is unlikely), it will not reduce conflicts as long as the attractants engendering the conflicts remain unsecured. The best way to reduce conflicts is to secure human attractants, not to establish a sport hunt. FWP must consider the numerous studies showing that a sport hunt does not reduce conflicts.

b. Hunting is unlikely to reduce human-grizzly conflicts and make the public safer by “hazing” bears.

The first consideration in the Draft Plan is that hunting may reduce human-bear conflicts because bears that aren’t killed are instead hazed by a near miss. Draft Plan, page 106. FWP does not offer evidence to support this idea and ignores evidence to the contrary. Although grizzly bears are more likely than other bears to respond aggressively to perceived threats, research by behavioral ecologist Steve Herrero showed that grizzly bears “*that have interacted enough with benign humans to internalize a less fear-based response*” can “*exhibit a high degree of tolerance for humans.*” Mattson (2020), discussing Herrero (2002) and (1972). Contrary to the relevant research, the Draft Plan suggests that if a bear “*senses that it is being harassed*” when experiencing near misses by bullets, then hunting in these cases may “*serve a similar function as does purposeful hazing.*” Draft Plan, page 106. The literature shows, however, that improving interactions between bears and humans is not done by fear conditioning, but habituation through benign experiences.

The Draft Plan also fails to address the extremely low odds of a person being attacked by a grizzly bear, and thus that using a hunt to achieve the outcome of public safety is not only unreasonable but also unnecessary. People have a 0.3-0.6% chance of a being attacked during ‘close encounters’ with grizzlies, defined as a distance of 50-120 yards (Mattson 2020). And this is limited to situations where people were aware they had a close encounter at all. Almost all of the time, bears either flee or don’t react. Bombieri et al. (2019) found no significant difference in the number of grizzly attacks in countries with a legal brown bear hunt compared to those without. The rarity of attacks on humans calls into question the need for purposeful hazing via near misses even if it was supported by any empirical evidence.

c. Hunting is unlikely to reduce conflicts by removing bears that are “less wary.”

The Draft Plan suggests that hunting could reduce human-grizzly conflicts by disproportionately removing bears from the population that are “*less wary*” because hunters are more likely to come across these genetically less wary bears, and which are also likely to also be the bears that are

“disproportionately . . . most apt to respond to human attractants.” Draft Plan, page 106. The Draft Plan here misses the point on what makes bears “apt to respond” to human attractants.

Determinants of conflict patterns are both geospatial and temporal in nature. Geospatially, conflicts usually occur where unsecured anthropogenic attractants exist adjacent to vegetation cover, providing food near forest edges where grizzly bears prefer to be (Mattson 2020) citing Elfström et al. (2014), Graham (1978), Mattson (1997b), and Fernandez et al. (2012). Research done in Montana similarly showed that most conflicts occurred near riparian areas with nearby agricultural attractants (calving pastures, beehives, boneyards, sheep). Wilson et al. (2005, 2006) Wilson et al. (2014), Mattson (2019a). Temporally, conflicts increase when natural food abundance is low. Natural food abundance is generally decreasing—therefore increasing the likelihood of conflicts—as cutthroat trout, whitebark pine, and army cutworm moths, among other major food sources, disappear. Additionally, conflicts are more likely on a yearly basis during hyperphagia, when bears prepare for hibernation.

Thus, bears respond to human attractants not because they are “less wary,” but instead because they need to eat, they can easily find unsecured anthropogenic food sources, and because their natural food sources are disappearing as the natural world changes and deteriorates. Hunting is not likely to kill conflict bears and will not reduce the major drivers of conflict. In claiming that bears more likely to be attracted to anthropogenic food sources are so attracted because they are “less wary,” FWP ignores the catalogue of scientific literature contradicting its conclusion. If FWP wishes to reduce conflicts it should focus on instituting a coexistence infrastructure wherever grizzlies, people, and/or people’s property share space.

d. Hunting is unlikely to remove primarily dominant males, which itself would be unlikely to help females.

The Draft Plan claims that removing dominant males, which may be possible during guided hunts, could “allow females with cubs to spend longer” in secure areas with the best food patches. Draft Plan, page 106. Though it’s unclear why this in the human-bear conflict section of the plan, relevant research contradicts FWP’s conclusion that a hunt targeting dominant males will somehow assist females and their cubs. On the contrary, research shows that for large carnivore species that practice sexually-selected infanticide (SSI) like grizzly bears, hunting predominantly targeting males has *negative* consequences for females and cubs. (Milner et al. 2007).

Mature resident males play a significant role in upholding the social structure of grizzly bear populations. When they are removed by sport hunting, the resulting “influx of non-sire males” would likely kill even more cubs and yearlings (Mattson 2020). This, in turn, would mean reproductive females are even less likely to spend time in “the most secure and best food patches,” which would decrease fecundity. Mattson (2020) points out the “overwhelming empirical support” in over 20 publications (Bellemain et al. 2006, Gosselin et al. 2015, 2017,

Bischof et al. 2018), (showing that SSI is amplified by sport hunting); (Stringham 1980, Swenson et al. 1997, Wielgus et al. 2013, Gosselin et al. 2015, Frank et al. 2017, Bishof et al. 2018) (showing that sport hunting causes compensatory effects on birth and death rates; (Swenson et al. 1997, Wielgus et al. 2001, Ordiz et al. 2011, 2012, Gosselin et al. 2017, Leclerc et al. 2017, Bishof et al. 2018, Frank et al. 2018) (showing deleterious social restricting occurs from sport hunting, “including an influx of potentially infanticidal males); (Wielgus and Bunnell 2000, Ordiz et al. 2011, 2012, Hertel et al. 2016, Bishof et al. 2018) (and that “foraging efficiencies of adult females decrease); and (Bourbonnais et al. 2013 and Støen et al. 2015) showing that in tandem, sport hunting also causes “increased physiological stress on females,” showing that SSI is amplified by sport hunting, among other deleterious consequences, which FWP must consider.

e. Hunting is unlikely to reduce conflicts by reducing density at the local scale, unless local populations are nearly extirpated.

According to the Draft Plan, some hypothetical hunting scenarios could reduce conflict by reducing population densities at the local scale. Draft Plan, page 106. Mattson (2020) concluded that although there is little evidence on this issue, the weight of the available evidence shows that a sport hunt would not reduce conflict unless bears “*are driven to local near-extirpation.*” Thus, it is unlikely that FWP could use hunting to assist in conflict reduction while also meeting the goal of maintaining a recovered population of grizzly bears.

Additionally, the one piece of empirical evidence for all four of these “aspects of the situation” is Garshelis et al (2020), which the Draft Plan relies on to support the contention that hunting-caused population reductions could reduce grizzly conflicts, because this study demonstrated this with black bears. Draft Plan, page 106. FWP’s reliance on Garshelis et al (2020) is misplaced. Significant differences between black and grizzly bears are relevant to whether or not extirpating them on the local scale is sustainable. North American black bears “*produce 10-20 times as many cubs per unit area and exist at 10-times the densities of sympatric grizzly bears.*” (Mattson 2020). Locally extirpating grizzly bears will have much more dire consequences on the grizzly bear population than doing so with black bears and is simply unsustainable even if it did reduce conflicts, which it is unlikely to do in any event.

The Governor’s Grizzly Bear Advisory Council wrote: “*...hunting is not likely to be an effective tool for conflict prevention or reduction*”.

III. Any sport hunt for grizzlies is a trophy hunt, which the majority of the public disagrees with.

“*Would a grizzly bear hunt be a ‘trophy hunt’?*” Draft Plan, page 99.

FWP’s attempt to justify a grizzly bear hunt as anything but a trophy hunt falls flat, severely undermines FWP’s credibility, and calls FWP’s motives into question. The Draft Plan reasons

that *“hunting a grizzly bear would not be different from hunting deer or elk”* because it is really just another kind of subsistence hunting, as the hunter in both situations is prohibited from *“wasting edible meat.”* Draft Plan, page 99. FWP fails to account for at least two factors here. First, as Christopher Servheen, long-time expert in grizzly bear conservation, noted in the Montana Wildlife Federation’s comment on this plan, *“[f]ew if any people who kill a grizzly bear would do so for the meat.”*

Additionally, most grizzly bear meat is not edible because it is infected with the parasite *Trichinella*. So, although MCA 87-6-205 prohibits wasting the meat of game animals, section (5) excepts from this prohibition grizzly bear meat found to be infected with trichinosis because it is *“not considered to be suitable for food.”* Samples taken from hunter killed grizzly bears in Montana in 1968 and 1969 showed that 79% and 67% of bears were infected with the *Trichinella* parasite, respectively (Greer 1972). Another study found 58% of bears from western Montana Wilderness areas were infected (Worley et al. 1976). Assuming numbers are similar today, a minimal number of grizzly bears killed would be edible at all, and hunters could likely ‘waste’ 4 out of 5 grizzly bears while still complying with the law.

Now that we have established this would be a trophy hunt, we implore FWP to more seriously consider the widespread disapproval of trophy hunting and the backlash that is going to ensue across Montana. FWP is a *public* agency managing *public* trust assets. FWP’s mission is to *“steward the fish, wildlife, parks, and recreational resources for the public, now and into the future.”* Establishing a trophy hunt clearly goes against FWP’s mission. Scientific literature considering whether the public approves of trophy hunting demonstrates that the majority of the American public does not. The Draft Plan itself acknowledges that many Montanans find the idea of a grizzly bear hunt to be *“offensive.”* Draft Plan, page 99. The Draft Plan also states that numerous surveys of public attitudes demonstrated that trophy hunting has *“much less public support”* than hunting to put meat on the table. Draft Plan, page 99. Additionally, somewhere between 65-70% of adults in the U.S. either do not support trophy hunting or outright object to it for ethical reasons (Mattson 2020). FWP cannot simultaneously institute a grizzly hunt and its management plan be *“broadly acceptable to most Montanans.”* Draft Plan, page 100. Most Montanans, and most people in the U.S., disagree with or oppose trophy hunting. FWP cannot have it both ways.

Moreover, establishing a trophy hunt could reduce public support for subsistence hunting. Darimont et al. (2020) discussed the hunting of large carnivores within the social fabric of today’s society and explained that trophy hunting is *“misaligned”* with both the *“dominant public values and attitudes concerning treatment of animals”* as well as conservation concerns. More concerning for FWP is the study’s discussion of the ‘social license to hunt’ that is granted by the general public. The authors suggest that *“the killing of large carnivores for trophy and not food, conducted by few hunters, has potential to threaten [the social license to hunt] afforded to the larger group who hunt for food.”* Citing data from 2019, the study explains that 84% of the public approves hunting for meat, compared to 29% approval for acquiring a trophy.

IV. Legal killing opportunities increase illegal killing and do not increase social tolerance.

In essence, the Draft Plan attempts to justify a grizzly bear hunt because it would increase the social tolerance for grizzly bears among private landowners. FWP makes the dubious logical leap that (1) allowing a hunt (2) would engender private landowners—who may never even be involved in a hunt or have grizzlies near their land hunted—to cooperate more with conflict prevention (3) because they will trust FWP more than if a sport hunt were not established, and (4) therefore, establishing a hunt would “*benefit all Montanans for whom managing an interconnected grizzly bear population is a value*” because these hypothetical private lands will be safer for grizzly bears. Draft Plan, page 100.

Notably, the Draft Plan did not consider that landowners experiencing conflicts might cooperate with conflict prevention efforts in order to *prevent conflicts*, which as previously discussed a hunt is unlikely to do. Indeed, FWP has up to this point relied on conflict prevention in conflict-prone areas. In 2021, FWP noted that conflict prevention is the “*primary strategy*” to reduce conflicts on the Rocky Mountain Front, and that prevention is “*fundamentally necessary . . . to build or maintain tolerance for grizzly bear coexistence . . .*” (Rocky Mountain Front Grizzly Bear Management Program Annual Report 2021). FWP also noted in the 2021 Annual Grizzly Bear Management Report for the NCDE portion of Region 1 that “*tolerance for grizzly bears has improved*” and residents in grizzly country “*expect bears to be around and have learned or are learning how to coexist.*” No hunt needed.

FWP is clearly aware that conflict prevention—not a hunt—is the best strategy to maintain tolerance for grizzly bears. If a landowner is experiencing conflicts, a grizzly bear hunt in another part of the state will not solve their problem. Moreover, FWP’s resources may be stretched even more thinly because it has decided to oversee a hunt, which may strain its ability to help landowners adequately and effectively respond to conflicts. Indeed, the Draft Plan projects that the “*workload involved with FWP staff*” resulting from managing a hunt would be a challenge. Draft Plan, page 109. FWP is more likely to increase tolerance for grizzlies by focusing on and helping landowners with conflict prevention and reduction.

Additionally, although there is little research on whether legal recreational killing of grizzlies increases social tolerance, research on other carnivores shows that it does not. Such research on wolves “*found little change in attitudes toward wolves*” among Wisconsin residents with increased legal killing of wolves, and “*among certain people they found less tolerance and a greater proclivity to poach wolves, especially among hunters and male residents.*” (Mattson 2020 discussing Treves et al. (2013), Hogberg et al. (2015) and Browne-Núñez et al (2015). Additionally, Chapron & Treves (2016) found indications that poaching in Wisconsin and Michigan *increased* after legal culling of wolves was instituted. Based on the available research, Mattson (2020) concluded that it’s unlikely that a sport hunt will increase acceptance of grizzly

bears among *“most back-country users, hunters, and rural residents,”* but that its more likely that establishing a hunt will be *“understood by rural residents . . . who resent the presence of grizzly bears as a tacit or even explicit commitment by FWP”* to kill bears.

FWP misrepresents the one piece of evidence it uses to support the contention that a hunt will increase social tolerance among rural landowners, arguing it would provide a *“sense of inclusion,”* which would improve their cooperation with conflict reduction. Draft Plan, page 100. FWP cites Lewis et al. (2012) as *“indirect evidence”* showing that *“tolerance for having wolves”* on Montana’s landscape was low as of 2012 but that *“dissatisfaction”* decreased following the 2011 wolf hunt. Draft Plan, page 100, FN 8. In reality, Lewis et al (2012) showed that *“reported tolerance with wolves being on the Montana landscape . . . was the same both before and after the 2011 Montana wolf hunt. That is, tolerance did NOT significantly change following the 2011 Montana wolf hunt.”* Lewis et al (2012) concluded that *“attitudes and beliefs regarding wolves may be highly resistant to change and not easily influenced by specific management efforts.”*

Overall, the Draft Plan has an alarming dearth of empirical evidence, logic, and common sense in its attempt to justify a grizzly bear hunt.

Management Removals

Management removals are a primary threat to grizzly bears. FWPs has used a heavy hand in responding to management conflicts, particularly with livestock, even within the PCA. Over the past few years management removals have increased significantly, indicating lower tolerance from FWPs. In addition to management removals by livestock conflicts and depredation, FWP and other agencies routinely engage in lethal and non-lethal removal of bears under other circumstances. Given the grave threat posed by management removals, the final Plan must focus on conflict reduction and prevention, public education and outreach, and reducing human-caused mortality from all sources, including management removals.

The U.S. Fish & Wildlife Service (2021) Species Status Assessment for grizzly bears (SSA) determined that the primary threat or stressor to grizzly bears and their recovery in the lower-48 is human-caused mortality, including management removals, and the “main impact” to grizzly bears is human-caused mortality resulting from management removals in response to livestock depredation. Several hundred reported mortalities in the core ecosystems between 2002-2020 were attributed to management removals: 283 of 700 in the GYE; 157 of 511 in the NCDE; and 4 of 58 in the CYE and SE. FWP fails to discuss and analyze the effects of management removals on the population and does not explain the processes governing removals and how it may change if bears are delisted. These inadequacies undermine the draft EIS’s statement that “[t]he statewide management plan and its implementation will help ensure long-term recovery and sustainability in Montana and will provide predictability about management of grizzly bears.” Draft EIS, p. 118. The Plan does not provide predictability.

Because grizzly bears are still protected as a threatened species, the U.S. Fish and Wildlife Service must be included in a state agency's decision on whether to kill or move a grizzly bear. Granted, the Service usually defers to the state agency. Regardless, the Plan must discuss what will be permitted 'take' via management removal if they are delisted. Currently, grizzly bear 'take' is governed by a special 4(d) rule under the Endangered Species Act, where 'take' is defined as to "harass, harm, pursue, hunt, shoot, would, kill, trap, capture, or collect or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19). The 4(d) rule prohibits the "take" of grizzly bears in the lower 48 States unless done: (1) in self-defense or in defense of others; (2) for the removal of a "nuisance bear," which requires a "demonstrable but non-immediate threat to human safety" or when a bear commits "significant depredations to lawfully present livestock, crops, or beehives" but only if it was not possible to eliminate the threat or depredation by live-capturing and releasing the bear and when the taking is done in a humane manner by authorized personnel; or (3) for scientific or research activities but only if such taking does not result in the death or permanent injury to the bears involved. 50 C.F.R. § 17.40(b)(1)(i). FWP must describe how it will address the decisions to kill or move bears if federal regulations no longer apply to ensure that management removals happen as infrequently as possible.

FWP has recently demonstrated a reckless approach to management removals in Region 4. FWP Region 4 supervisor Gary Bertellotti recently approved the use of rifles to kill grizzlies. With this authority, FWP biologists shot seven bears inside the NCDE PCA, even though Bertellotti admitted at the December 2022 NCDE subcommittee meeting that they are shooting grizzlies even in situations where FWP staff "*can't distinguish which bear*" was involved in a conflict. FWP must detail how it will avoid the senseless and unnecessary management removals like those authorized and carried out by Gary Bertellotti.

The Plan explains that "*human-caused grizzly bear deaths are an unfortunate but inevitable result of an expanding bear population that is increasingly closer to agriculture, livestock, residences, and suburban areas.*" Plan, page 76. But FWP can, and must, proactively manage known causes of mortality, including management removals, to reduce these unnecessary deaths.

I. FWP should prioritize conflict prevention in areas outside of connectivity corridors.

Grizzly bears expanding eastward or between populations in areas FWP determines are not likely to contribute to connectivity are individually important and they have an inherent right to exist in their historical range. Drawing arbitrary geographical boundaries based on assumed social acceptance to determine where FWP will or won't tolerate naturally occurring grizzly bears is unacceptable. Wherever grizzly bears go or are likely to go, FWP should prioritize conflict prevention both to protect grizzly bears and those whose interests intersect with their presence.

The Draft Plan repeats the notion that the lives of grizzly bears dispersing east of the continental divide will be worth little. Specifically, the Draft Plan states that FWP "*would have lower tolerance*" for conflict bears here because "*agricultural development predominates*" in this area and

eastward expansion does not contribute to connectivity. Draft Plan, pages 6, 8. The Draft Plan also states that *“FWP will be quick to recommend [or implement] control when conflicts arise”* in these areas and that bears here *“could be accepted to the degree they remain conflict-free.”* Draft Plan, pages 6, 40. Instead of waiting for conflicts to arise, FWP must manage conflicts before they happen. And to the extent that the Draft Plan here implies that even conflict-free grizzly bears won’t be accepted if they are present outside of certain areas, this severely undermines FWP’s attempt to demonstrate that adequate regulatory mechanisms are in place to support a delisted population.

The Draft Plan’s position on eastward expanding bears also undermines years of work by the Choteau FWP office. According to the Choteau Office’s 2021 Management Program annual report, *“[g]rizzly bears have a long history of occupancy on the front,”* and their eastward expansion *“creates an elevated need for proactive conflict management and education.”* The report notes that FWP’s primary strategy thus far has been to reduce conflicts, and thereby *“build or maintain tolerance for grizzly bear coexistence on the Front,”* demonstrating that FWP has already put in staff time and agency resources to prepare the Front for grizzly bears. By going back on FWP’s previous priorities to coexist and reduce conflict in favor of intolerance and reactionary management, FWP would be undoing years of its own work and progress.

II. FWP should make all reasonable efforts to reduce and prevent management removals in connectivity corridors.

The U.S. Fish & Wildlife Service Species Status Assessment makes clear that grizzly subpopulations must be connected for the species to recover. Grizzly bears can achieve this if dispersing bears are not subject to management removals because of unnecessary conflicts that are certain to ensue under this proposed Plan. The Draft Plan shows that dispersing bears will face significant and unnecessary danger because the Draft Plan does not prioritize coexistence, education, and conflict prevention.

First, the final plan must clearly provide information, including maps, on which areas FWP has determined will be likely to contribute to connectivity and how FWP made these decisions. How does FWP plan to decide which areas fit within this category and which do not? Will *all* areas potentially supporting connectivity be included, and if not, on what basis will areas be excluded?

Second, the Draft Plan is unclear and repeatedly contradicts itself and the Draft EIS when describing how FWP will manage bears whose presence they determine *“can contribute to long-term persistence and connectivity.”* Draft Plan, page 8. The Draft Plan first commits to making *“all reasonable efforts”* to recommend or implement *“actions that minimize bear removal”* in these areas. Draft Plan, page 6. This sentiment is also reflected in the Draft EIS (page 118). Next, the Draft Plan says that FWP will manage bears in these areas for a *“significantly lower density,”* Draft Plan, page 8, but later states an objective *“would be to manage for connectivity”* in areas between core populations where bears are moving naturally or are likely to do so. Draft Plan, page 40.

FWP must untangle these confusing and contradictory statements in the final version of the Plan. How does FWP making all reasonable efforts to minimize bear removal comport with managing for a “significantly lower density”? What is the threshold of a significantly lower density, and what does FWP plan to do if the number of bears is over that threshold? How does FWP determine what is an acceptable density if it lacks accurate estimates of bears present between core populations? Does FWP plan to cause mortality to keep bears at this undefined significantly lower density? How does FWP plan to manage for a lower density in connectivity zones with also managing for connectivity? And, specifically, given that roughly thirty percent of the current distribution of bears in the GYE is beyond the recovery zone and DMA, how does FWP plan to manage these bears, or bears similarly situated near the NCDE, for a “significantly lower density?”

Instead of describing how FWP will keep bear densities low in connectivity areas, or how FWP will “not manage for grizzly bear presence outside of core areas,” Draft Plan, page 6, FWP should detail how it plans to reduce management removals in connectivity zones. As it stands now, the Draft Plan seems to imply that FWP may not only increase the perceived need for management removals by failing to adequately prevent conflicts, but that it may purposefully cause more management removals to keep bears between core populations at a certain density.

The Draft Plan also states that bears between core areas “*must be able to adapt*” to the reality that they will be closer to people and therefore “*will likely have a higher probability of suffering human-caused mortality.*” Draft Plan, page 40. We’ve seen already that even non-conflict bears in between populations can be removed and relocated, as was the case in October, 2022, when two bears were preemptively moved out of the Bitterroot Valley to the Sapphire range. But it is humans who can and must adapt, and FWP that must lead this charge. FWP should be using the scientifically-backed coexistence measures shown to prevent and reduce conflict, especially considering that bear dispersal in these areas are essential for the recovery of the population.

III. FWP should commit to and describe its plan for public transparency regarding management removals.

FWP should be consistently disseminating information to the public regarding its decisions to remove bears, including why, when, where, and how bears are removed. The Draft Plan states that for the preferred alternative, “*FWP would continue to document bear conflicts in a standardized, inter-agency database.*” Draft Plan, page 42. FWP also recognizes the need for more consistency statewide regarding “whether, when, or how” information is disseminated regarding “[w]hat happens when there is a grizzly bear conflict relocation, or mortality.” Draft Plan, page 46. This data should be public and FWP should use the Plan to detail the process by which it plans to disseminate all information related to management removals. The public has a large stake in grizzly bear recovery because many Montanans live in grizzly bear country and grizzly bears “*occupy a primary role in Montana’s cultural heritage,*” Draft Plan, page 39, and Americans as a whole have contributed significant tax dollars to recover the species over the last several decades.

FWP recognizes in the plan that *“rural residents, recreationists, ranchers, farmers, and all others with the potential to interact with grizzly bears would benefit from more knowledge about bears...”* Draft Plan, page 99. FWP should make this a reality within the final Plan.

The public database should include information on why, when, and where grizzly bears are captured, relocated, or killed, including bears that are captured that do not survive and the fate of bears that are captured and transferred to another agency like the Montana Department of Livestock, or that are transferred to FWP from another agency, like Wildlife Services. USDA Wildlife Services transferred over 40 bears to FWP or the USFWS between 2015-2019. FWP itself takes, via capture and release, roughly 30 grizzly bears each year, but when bears are released into new areas they often do not survive or are killed by other grizzlies. This information must be documented and publicly available. The database should also track the number of bears that are intentionally killed by or unintentionally caught in traps set by the Montana Department of Livestock. Without this information, the public cannot meaningfully engage on grizzly bear management.

IV. Conflict response procedures should be clearer in the final Plan.

The Draft Plan’s flow chart for the conflict response process is messy and unclear; FWP must fix this in the final plan. Draft Plan, page 94. The process guiding decision-making on management removals should be based on clear guidelines and communicated to the public. And if FWP applies different procedures and decision-making processes for removals on the east and west sides of the divide, these differences need to be clear as well.

The flow chart also includes a section called *“bad for this bear but good for the bear population,”* which provides several problematic questions that would decide the fate of the bear, including whether bears are *“clearly not an objective in this general area,”* and whether trapping or euthanizing the bear would *“increase future tolerance.”* Draft Plan, page 94. As discussed in the hunting section of this comment, euthanizing bears almost certainly will not increase social tolerance, as demonstrated by relevant scientific literature that the Draft Plan routinely ignores. Helping bears survive and avoid conflicts should be paramount—bears surviving would be “good for the bear population.”

Further, when FWP captures non-conflict bears, the Draft Plan states *that “[i]f the situation allows, these bears would be left in place,”* but that sometimes moving the bear is required. Draft Plan, page 9. FWP needs to explain what situations would require the movement of a non-conflict bear. FWP also states it would preemptively capture and move a non-conflict bear, if that bear is in a *“risky place.”* Draft Plan, page 94. What is the definition of a ‘risky place’ and who makes that decision? Does FWP first consider that many bears captured and released elsewhere do not survive, and thus that this policy leads to unwarranted deaths?

The management removal practices of FWPs are yet another inadequate regulatory mechanism.

Trapping and Hound Hunting Impacts

The Draft Plan totally fails to account for the impact the State's hunting and trapping regulations have on grizzly bear health and survival. Low-density, wide-ranging species are particularly affected by trap bycatch as the loss of any individuals can jeopardize the population and genetic interchange. Trapping is a direct threat to species listed under the ESA including grizzly bear. The Draft Plan does not assess the impacts of its trapping and hunting regulations on the illegal taking of grizzly bears.

Taking of species listed under the ESA is illegal. The definition of "take" is *"to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."* Incidental take is an unintentional, but not unexpected taking which is also illegal. For example, in cooperation with the U.S. Fish & Wildlife Service, FWP's and the National Forests must seek an Incidental Take Statement which estimates the amount of allowable incidental take resulting from activities authorized by their trapping and hunting regulations and Forest Plans. This baseline is not to be exceeded. Trap bycatch of grizzly bears resulting in wounds and potential death is an increasingly new source of additional prohibited take under the precluded actions of "harm, wound, trap, capture, kill" that must be accounted for and actions taken to prevent it. This consultation must occur because the Draft Plan will be implemented whether grizzly bears are delisted or not (cite page number).

Many furbearers are trapped using body-gripping traps designed to kill quickly and humanely—*for the target species*. Body-gripping traps, especially those set for marten and weasel, are a threat to grizzly bears causing serious injury including amputation of feet and toes, bone loss and death. A study in British Columbia (Lamb et al. 2022) found that $\approx 7\%$ of all grizzlies in their study sample had missing toes on front paws.

A major cause was bears sticking their feet into baited body-grabbing traps for marten. This is not a rare or isolated occurrence. They found the same pattern in a review of other studies including 5% of grizzly bears surveyed in the Purcell Mountains in British Columbia and several grizzly bears observed walking around with traps still attached to one of their front feet. These include a photograph from Wyoming and a grizzly killed by a hunter in British Columbia with traps on their feet. Lamb et al.'s photographs of bears with amputated feet/toes suggested that traps had been on their feet for weeks or months. The lack of circulation caused necrosis and the injured portion of the foot eventually sloughed off.

The International Standards Technical Committee rated amputation of three or more digits and any amputation above the digits as Severe Trauma (cited in Lossa et al. 2007). A grizzly bear who has lost claws, toes or a front foot will have reduced capability of digging for food and for excavating a viable winter den. This can reduce health and survival.

FWPs (2022) recommends: “use baits and lures that attract target species but not other animals.” Lamb et al. found that baited traps definitely attracted grizzly bears with younger bears more vulnerable.

To prevent bears from having their feet caught in traps set for marten, Lamb et al. recommend that the elevated cubby boxes have openings large enough to pass a marten but too small for a bear to fit a whole foot through. By regulation, in southeast British Columbia this dimension is no larger than 3.5 inches (8.9cm). In Montana, there are no regulations or recommendations specific to preventing bycatch of grizzly bears. There is a *non-binding recommendation* that cubby boxes have a closed front with an opening of 2.5 x 2.5 inches to prevent bycatch of fisher but the regulations for ground sets allow openings up to 52 square inches which is many times the recommended opening.

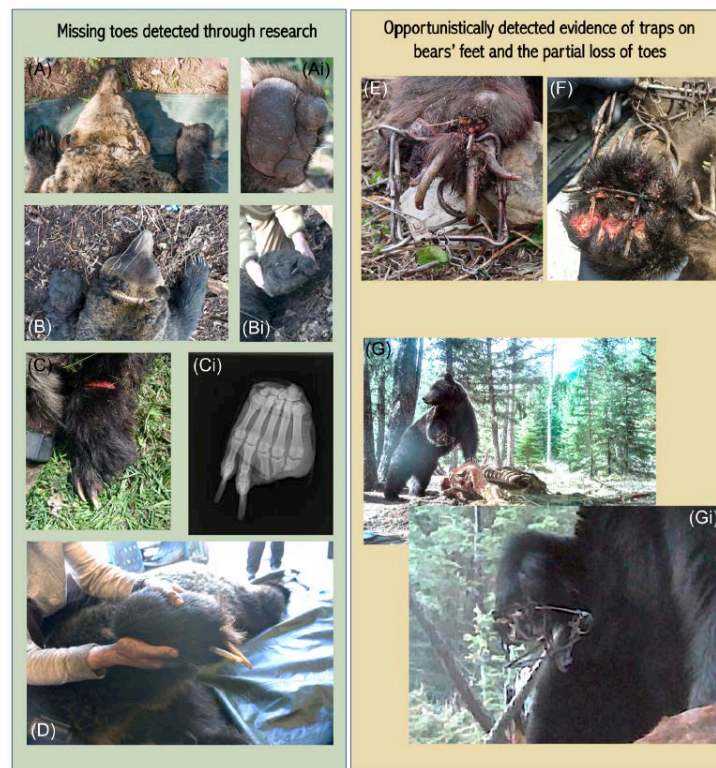
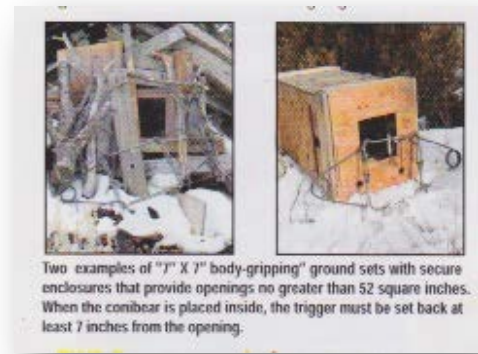


Figure 9. Left: Photos show grizzly bears with missing claws and toes discovered through research. Right: Photos show mutilation of grizzly bear feet due to being caught in a trap. Source: Lamb et al. (2022). Full citation in Literature Cited.

Along with body-gripping traps, neck snares and foot and leg-hold traps for wolves, coyotes and other canids are a direct threat to grizzly bears. Snares, whether restraining or killing types, were found to be inhumane and their use never justified (Rochlitz 2010). Ten states have banned or restricted their use on public lands including the western states of Colorado, Arizona, New Mexico, Washington and California.



Dr. Christopher Servheen and 34 other wildlife professionals (2022) say it is a certainty that grizzly bears in Montana will be maimed and killed by traps set for wolves. Servheen (2022) shows a photograph of a grizzly with a neck-hold cable snare that was deeply embedded in its neck. It had chewed the cable off the tree which also caused pain and injury. This bear was shot and killed by a black bear hunter in mistaken identity but it probably would not have survived in the wild with such grievous injuries. At least 5 grizzly bears in southeast British Columbia are known to have been caught in foothold traps set for wolves and several more in adjacent study areas and a grizzly bear in Wyoming was caught in a snare set for wolves (Lamb et al. 2022). McLellan et al. (2018) report one grizzly bear killed after being caught in a snare. Moreover, FWPs reported that between 2012-2022 six grizzly bears were non-target captures of traps including one grizzly caught in a leg-hold trap set for wolves and at least two grizzly bears suffered foot injuries prior to release.

Figure 10. Montana Fish, Wildlife & Parks brochure shows regulations allow openings that are too large to prevent bycatch of grizzly bears and other species.

Other incidents in Montana include the Rogers Pass area where traps set for coyotes and baited with dead foxes caught two grizzly bears including a grizzly bear cub which was released. The other grizzly was seen running off with a trap on its foot. In the upper Blackfoot Valley, a leghold trap set for bobcat was found with grizzly bear toes and claws in it. A black bear was found piled on a trapper's boneyard with a neck snare still on it. Other black bears have been killed by neck snares. (pers. comm. with J Jonkel, FWPs Region 2 bear manager)

Cattet et al. (2008) reported that one grizzly died of capture myopathy which is a physical reaction to the stress and trauma associated with snaring—approximately 10 days after being captured by a leghold snare. The U.S. Fish & Wildlife Service (2021) reported the death of a subadult male grizzly from exertional myopathy after being trapped in 2019.

These are just the mortalities detected. Cattet et al. cited explanations for why mortalities may not be detected including scavengers or predators consume carcasses, animals die in concealed places, carcasses decompose quickly, radio transmitters malfunction, or animals fitted with radio transmitters emigrate from the study area. They also found that 70% of grizzly bears captured by leg-hold snares had elevated levels of serum indicating some level of trauma and muscle injury

with mobility reduced for up to a month or more. Multiple captures have an effect on body condition with reduced potential for growth, reproduction and survival.

In Montana, snares for most species are required to break loose with more than 350 pounds (approx. 159kg) of dead pull strength) while for wolves this requirement is 1,000 pounds (FWPs 2022). However, Lamb, et al. (2022) found that on average an adult grizzly bear has about 342 pounds (155kg) of dead pull strength, not enough to break free. Cubs and sub-adults with less pull strength are particularly vulnerable. While bears can generate more pull strength with a running start up to 20 feet, this is not recommended due to the elevated risk of severe injury and damage to or loss of traps. Lamb et al. also tested traps and could only free trapped adult grizzly bear feet about 20% of the time.



Grizzly bear cubs are inquisitive and vulnerable to trap bycatch and have been killed while their mothers are caught in traps. U.S. Forest Service photo.

In addition to physical injury, trapped grizzly bears are also vulnerable to being killed by other grizzly bears and Lamb et al. report one cub was killed while its mother was trapped.

Within lynx critical habitat or protection zones, use of fresh meat for bait is not allowed but tainted bait meat defined as being exposed to temperatures above freezing for 24 hours is allowed.

Depending on ambient temperatures, in some cases such baits are effectively fresh meat and in others rotting and even more pungent thus attracting non-target species including grizzly bears.

Conibear “body-gripping” traps are allowed in grizzly bear habitat if they have a jaw spread less than or equal to 5” and can be elevated at least 48” above the surface. These are well within the reach of even a subadult grizzly bear and wide enough to catch a front foot.

Another issue is trap-checking requirements. To prevent serious injury or death to a grizzly bear, it must be released within 24 hours (Cattett et al. 2008). Wolf traps are required to be checked every 48 hours but for all other species FWPs only recommends checking traps at least once every 48 hours but does not require it. Many traplines are only checked once a week meaning grizzly bear bycatch could go undetected for days.

As recommended by Lamb et al. (2022) the opening of trapping seasons for furbearers should be delayed to avoid trapping grizzly bears as they prepare to den. The pre-denning period is known as hyperphagia when bears eat voluminous amounts of food and are attracted to scented and

baited traps. With climate change, it is predicted that grizzly bears will enter the den later and emerge earlier (Pigeon et al. 2016). Mace and Waller (1997) found that not all grizzly bears had denned until December 16. Kasworm et al. (2021) found that 5% of grizzly bears had still not denned as of the third week of December. The highest proportion of grizzly bears did not enter the den until the first week of December. Region 2 Bear Manager Jamie Jonkel (IGBC meeting, 2022) stated that most grizzly bears in the upper Blackfoot and Scapegoat Wilderness do not den until around Christmas. Trapping for marten begins on December 1.

“Everywhere that grizzly bears may be present should be off-limits to hound hunting of black bears, and wolf trapping using snares, traps and bait from March 16 to December 31 when grizzly bears may be outside of their dens. The fact that this management plan does not address this critically important issue is a fatal flaw in this plan.” (Servheen 2023). We agree and in mild weather conditions, even after December 31 areas should be closely monitored for bear activity. Trapping seasons for otter, muskrat and mink currently run from November 1-April 15. To avoid attracting pre and post denning grizzly bears, these seasons should be adjusted to December 15-March 15.

Ninemile Demographic Connectivity Area

The Ninemile area on lands managed by the U.S. Forest Service has been designated as a Demographic Connectivity Area for female grizzly bears and their cubs (U.S. Fish & Wildlife Service 2018). Bader and Sieracki (2022) found sufficient denning habitat to support a small resident population.

This area is uniquely valuable to wildlife. The first wolves to naturally recolonize the region settled in the Ninemile to raise pups. This is also one of the few areas in the Northern Rockies to contain suitable habitat for grizzly bear, wolverine, fisher and lynx (Carroll et al. 2001).

As mentioned above, this area was designated to provide habitat for female grizzly bears and their cubs to provide genetic connectivity between the NCDE, BE and CYE Grizzly Bear Recovery Areas and it plays a central role in regional recovery planning. Reproductive females are the most vulnerable part of grizzly bear populations and sustainable female grizzly mortality for this area is zero.

Due to the regional significance this area has for wildlife recovery and genetic connectivity and the threat of non-target captures of grizzly bear, it is recommended that all trapping for wolf, coyote, marten and fisher be ended within the Ninemile DCA.

Adjustments to Methods, Traps and Checking Requirements

All traps set for marten and other furbearers should be *required* to have a closed front and an opening no larger than 2.5 x 2.5 inches.

Regulations in Montana state: *“Use secure methods of attaching traps - tailor methods to hold the largest species occurring in the area in case of an incidental capture.”* This encourages trappers to use the largest and most secured traps regardless of target species. To prevent bycatch, injury and death, trap size and strength must be tailored to the target species and have no more hold strength than necessary for the target species. The largest traps should be required to break free with no more than 308 pounds (140kgs) of dead pull strength to prevent holding grizzly bears.

The use of fresh and tainted meat as baits should be prohibited within grizzly bear habitats.

The data show that snares account for a large amount of bycatch with lethal consequences. The use of snares should be prohibited on public lands.

It is recommended that all traps be checked every 24 hours but in all circumstances for all species it should be **required** that traps be checked at least once every 48 hours.

Livestock Grazing

Impacts of livestock grazing on grizzly bear recovery in Montana cannot be understated. In a 2020 report presented to the Yellowstone Ecosystem Subcommittee (YES) of the Interagency Grizzly Bear Council (IGBC), livestock grazing was counted as a leading cause of death for grizzly bears between 1999-2018, with a marked increase in the 10-year period from 2009-2018. Pils et al. (2020). This report found that *“outside the Recovery Zone (RZ) but within the Demographic Monitoring Area (DMA), mortalities from livestock conflicts and self-defense kills are the primary sources of documented mortalities. Outside the DMA, livestock and site conflicts are the primary sources of mortalities.”* From 1999-2008, an average of one grizzly bear killed per year due to livestock depredations outside the RZ and inside the DMA, with 0.3 grizzlies killed per year outside the DMA following conflicts with livestock. The decade between 2009-2018 showed a significant increase, with an average of 5.4 grizzly bears killed per year due to livestock depredations outside of the RZ and inside of the DMA, and 3.1 per year outside of the DMA.

The impacts of livestock grazing on grizzly bear mortality are further highlighted in the Draft Plan. The Draft Plan states that during the four non-denning seasons from 2017-2020, the leading reason for capture (24% of captures that had clearly documented reasons) was large livestock depredation (cattle or sheep). In 79% of these captures (thirty-three incidents, although the number of bears killed per incident is not specifically stated), the “offending bear” was killed after capture. Draft Plan, page 95. The high percentage of grizzly bear captures attributed to livestock depredation that result in the death of one or more grizzly bears is a clearly concerning

trend that the Draft Plan and EIS merely glance over. FWP must include a further assessment of the large impact livestock grazing has on grizzly bears in the upcoming EIS.

One of the most concerning aspects of the Draft Plan's lack of analysis is that in the proposed action, grizzly bears will not be considered "necessary" outside of the specific recovery zones and the areas of connectivity in between these recovery zones (a problem that is detailed in other sections of these comments). This leaves a huge swath of historic grizzly bear habitat inaccessible to grizzly bears as they are certain to be slaughtered the minute they step into "Zone 3" on the Rocky Mountain Front and northeast of the Greater Yellowstone Ecosystem. Rather than drawing lines on the map that will lead to countless grizzly bear deaths, FWP should utilize resources and partners to better implement non-lethal conflict deterrence measures to allow grizzly bears to expand into their native habitat on the prairie with minimal conflict.

The way the plan currently reads, it is inevitable that the Rocky Mountain Front and other areas that FWP does not count as "necessary" for connectivity will become population sinks for grizzly bears, especially when those areas also have significant overlap with livestock production. Currently, four of the five counties that experienced the most livestock depredations between 2013-2021 are either completely in, or have portions in Zone 3, or areas that FWP does not consider "necessary" for grizzly connectivity. If these counties then lose resources that are necessary to *prevent* livestock depredations so that those resources can be focused elsewhere, we will likely see a skyrocketing number of grizzly deaths due to livestock conflicts. However, FWP can avoid this with appropriate attention to these areas.

Ample research shows the benefits of nonlethal conflict deterrence measures to reduce carnivore predation on livestock, including case studies of ranchers in Montana that are co-existing with grizzly bears. FWP would miss an important opportunity to further this research were the need ignored during the development of the state grizzly bear management plan. In the plan, FWP mentions the partnerships with NGOs that have helped further nonlethal conflict deterrence programs. Continued partnerships with these programs should be written into the plan along with the need to partner with universities for research into the newest information regarding nonlethal conflict deterrence measures.

There has been substantial research in recent years about the efficacy of nonlethal conflict prevention measures. Research shows that nonlethal methods are more effective than lethal control measures for preventing livestock depredation by large carnivores. Breck, et al. (2011), Lance, et al. (2010), Barnes (2015), Shivik et al (2003), and Stone et al (2017). Researchers have also found that, *"[b]ecause wolves co-occur across most of the grizzly bear range in the American West, many practices useful for managing wolf conflict also work for grizzly bears,"* and that *"carcass removal, electric fencing, human presence, range riders, and livestock guardian dogs are effective ways to deter both wolf and grizzly bear predation."* Western Landowners Alliance (2018). Additionally, studies show that the effectiveness of nonlethal tools is enhanced when several types are used in combination on an adaptive basis. Bangs, et al.

(2006), Breck, et al. (2012), Sime, et al. (2007). While FWP has noted in the plan that they intend to continue to prioritize conflict prevention, it is unclear to what extent this will be prioritized in areas that FWP currently has designated as not necessary for grizzly bear connectivity.

For all areas where grizzly bear populations overlap with livestock grazing, it is essential that the public understand exactly what is to be expected in the treatment of grizzly bears in this area. As currently written, the Draft Plan does nothing to discuss the extent to which FWP will partner with ranchers and livestock owners to prevent conflicts from occurring in the first place. This is something FWP must change in the next iteration of the management plan.

The Draft Plan and Draft EIS reiterate FWP's belief that they need a certain amount of flexibility to approach a variety of unique management situations. However, there should still be a certain level of certainty and accountability worked into the plan. Because livestock grazing is such a major source of mortality for grizzly bears, this topic in particular deserves proper prior planning. It is essential that the Plan outline the expectation that livestock owners use nonlethal conflict deterrence measures. Livestock owners must be expected to implement appropriate measures to prevent conflicts with grizzly bears, rather than just react to them. It is particularly important for the Plan to define such expectations for livestock producers who are grazing on state or federal public lands. Livestock owners making a private profit off of public resources must be expected to protect other public resources (i.e., grizzly bears).

While FWP does not have jurisdiction over federal grazing allotments or DNRC grazing allotments, there are still several options available for how they can ensure that livestock owners are working to prevent conflict so that grizzly bear mortalities related to livestock grazing can start to decrease rather than increase with the implementation of this new plan. First, FWP can create a set of standards to implement on grazing leases on Wildlife Management Areas. Second, and more importantly, FWP can set clear expectations for livestock owners using public lands across the state. The Plan must require appropriate implementation of nonlethal conflict deterrence measures before FWP will consider killing a grizzly bear in response to livestock predation. Without these standards, grizzly bears in areas that FWP has determined are not necessary to connectivity will be in grave danger. The following should be a minimum for what is expected of livestock owners prior to FWP considering killing a grizzly bear:

- Immediately removing and composting livestock carcasses found on the allotments;
- Removing sick or injured livestock from the allotments, so they are not targeted;
- Delaying turnout until after mid-June, so that native ungulate young can provide a food source;
- In the event of depredation, if future depredations are feared or anticipated, livestock should be moved (if on public allotments they should be moved to private pastures, if on private pastures, they should be moved to alternative private pastures);

- Keeping livestock in open, defensible spaces to reduce opportunities for ambush predation;
- Prohibit the turnout of young calves and lambs under 200 pounds in weight to reduce depredation potential, and protect calving and lambing areas with deterrents such as electric fencing;
- Securing livestock feed/grain;
- Require human presence by using range riders and guard animals and frequently checking livestock.

Additionally, the percentage of livestock that are lost to grizzly bears in the 30-county area considered in this plan is less than one-hundredth of one percent. Instead of killing grizzly bears—where the loss of one can have a substantial impact on the population, particularly in areas of connectivity—the focus needs to be on conflict prevention and coexistence.

Finally, while the Draft EIS does contain an assessment of food sources, it does not adequately assess whether grizzly bear food sources and any shifts associated with climate change might increase the risk of livestock predation, and therefore the mortality risk to grizzly bears. In the Greater Yellowstone Ecosystem, grizzly bears have increased their meat consumption substantially since the mid-2000s. Orozco and Miles (2013), Interagency Grizzly Bear Study Team (2012), Middleton, et al. (2013), Schwartz et al. (2014), and Ebinger et al. (2016). This is due in large part to the loss of whitebark pine seeds, a historically important food source for grizzly bears. The increase in meat consumption has resulted in increased livestock depredations and conflicts with big game hunters. It is essential that this is thoroughly analyzed in the upcoming EIS.

Recreational Impacts on Grizzly Bears

Summary

Montana's population is growing rapidly with a net immigration rate now three times higher than the average for the last two decades. In 2022 Montana's population grew 1.5%, at the 2nd highest rate of immigration nationwide. The centers of this growth are concentrated within the areas adjacent to and between the grizzly bear recovery areas and DMAs. This growth will have profound impacts on maintaining a viable grizzly bear population due to housing demands, recreation demands, and other amenities. Increasing development of wildlife habitat and the accelerating pressure on our wild lands by more and more people and recreation demands diminishes the grizzlies' chances of survival. Recommendations from the Grizzly Bear Advisory Group for managing recreation should be adopted in full including objective monitoring and assessment of successes, failures, and ability to adapt in favor of protecting grizzly bears.

New Forms of Recreation Use

Legendary Montana wilderness guide Smoke Elser observed there is a new breed of recreationist on the land:

“Mountain bikers are out to challenge the resource. It’s about how fast you can go and how many miles you can put on. Snowmobilers are after the highest mark on the hillside, the highest speed across the meadow.”

In the 1980s manufacturers began producing recreational machines that could go farther into previously inaccessible terrain. High power snowmobiles can traverse deep powder snow, enabling off-trail “high marking.” Mountain bikes became widely available and now feature shock absorbers, gas and electric-powered motors and spiked tires for over-snow use. ATVs are bigger and go faster. New technology includes snow bikes which are modified motorcycles with tracks instead of wheels which can access off-trail areas and negotiate tight spaces. Mountain bike advocates say that electric powered bikes are not motor vehicles but that’s like saying a Prius or a Tesla isn’t an automobile because they have electric-powered engines.

Recreation impacts on grizzly bears can take two forms: displacement and habituation, both of which are bad. Displacement drives grizzly bears away from high quality habitats with primary food sources, resulting in direct loss of habitat as well as habitat security which can reduce fitness and the ability for females to rear cubs (USFWS 2022). Grizzly bears that habituate to areas with high human recreational activity may lose their natural fear and avoidance of humans, which can lead grizzly bears to approach human residences and campsites and result in direct conflicts often resulting in the lethal removal of the bear.

The Draft Plan doesn’t even include the words mountain bikes and only mentions bicycling once and does not include the scientific information on the impacts on wildlife and wildlands resulting from increased mountain biking. Dr. David J. Mattson and other leading grizzly bear scientists have analyzed the impacts of different forms of recreation on grizzly bears, finding that mountain biking is many times more likely to result in a grizzly bear-human encounter and as much as 14X as much compared to activities such as hiking. Dr. Mattson is well-known as the former Field Team Leader of the Yellowstone Interagency Grizzly Bear Study Team. Mattson (2019) at pages 36-37 includes this statement: *“The few investigations of encounters between bikers and grizzly bears paint a stark picture (Schmor 1999, Herrero and Herrero 2000, Honeyman 2007, Servheen et al. 2017. Data polled from all of these reports show that 87% (+- 4.6%) of all documented encounters were at distances less than 50m, and that 52% (+- 10%) involved females with young. Of those close encounters, 89% (+- 6%) resulted in the biker either being approached or charged by the involved bear.”*

Likewise, a Board of Inquiry Report chaired by the former National Grizzly Bear Recovery Coordinator (Servheen et al. 2017) on the death of a mountain biker who crashed into a male grizzly bear was well-publicized. Dr. Servheen has also said that mountain biking in grizzly bear habitat is particularly conducive to bear-human confrontations due to surprise encounters.

“High speed and quiet human activity in bear habitat is a grave threat to bear and human safety and certainly can displace bears from trails and along trails. Bikes also degrade the wilderness character of wild areas by mechanized travel at abnormal speeds.” (Servheen quoted in Wilkinson 2020).

Mountain biking is occurring on state managed lands and the FWP's must also intervene on proposals for extensive new mountain biking trails within grizzly habitat managed by other partners in the Conservation Strategy.

Perhaps no project is more emblematic of the threat of unrestrained recreational impact on grizzly bears than the proposal to expand the Holland Lake Lodge into a four-season resort. Dr. Chris Servheen (2023, attached) told the Interagency Grizzly Bear Committee of which FWP's is a member these expansions of recreational use are an inadequate regulatory mechanism which will prevent delisting.

After reviewing the Montana Grizzly Statewide Grizzly Bear Management Plan here are additional specific comments and unanswered questions from the EIS regarding the effects of recreation on grizzly bears:

Recreation

page 7 - Food storage at campsites and day use areas is ineffective and insufficient at both the state and federal level. There is a lack of enforcement and public education due to budget constraints, with other priorities often taking precedence (MDFWP, EIS, Executive Summary, 2022).

University of Montana Survey Responses:

page 8 - Of the 7 key research results no statistics are provided for *“When asked about their emotional response to seeing a grizzly bear from a distance while walking, more Montanans reported they would be nervous, scared, or upset than those that reported they would be relaxed, not scared, or pleased”* (MDFWP, EIS, Executive Summary, 2022). Why were the statistics omitted?

In contrast, in a 2022 Tourism & Recreation Research (ITRR) travel experience survey, visitors to Montana were asked *“During your visit to Montana public lands, do you have any safety concerns while visiting Montana public lands?”* One specific category was wildlife encounters. Over 50% did not have a problem/concern; another 25% had minor problem/concern; and, approximately 5% expressed a major problem/concern. Note, that over 75% of visitors survey expressed that their greatest concern was conflicts between user groups (ITRR, Montana Travel Experience Survey, Public Lands Experience, 2022). Perhaps FWP's should commission a study from the ITRR to focus specifically on value orientations of Montanans relevant to grizzly bear management.

page 8 - Only “4% surveyed support as much grizzly bear hunting as possible” yet this appears to be a high priority in the Draft Plan and supported by the current politically appointed Fish & Game commission members, many whom are commercial outfitters or members of national and international trophy hunting organizations who will reap the monetary windfall from grizzly bear hunts. Why does this inconsistency in reporting exist? (MDFWP, EIS, Executive Summary, 2022).

Human safety

page 11 - “FWP would maintain a focus on human safety and conflict prevention” (MDFWP, EIS, Executive Summary, 2022). This strategy remains ineffective and insufficient regarding the lack of enforcement and educational efforts due to budget constraints, with other priorities often taking precedence. How effectively are these strategies monitored and measured?

MDFWP responsibility to maintain public safety is not a prerequisite on adjacent federal lands designated as wilderness areas or wilderness study areas. The Wilderness Act of 1964 (Public Law 88-577) states, “... these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character “ (Sec. 2.(a)). Wilderness is defined as having “outstanding opportunities for solitude or a primitive and unconfined type of recreation” (Sec.2) (c).

page 14 - **Prioritizing information, outreach, and communication efforts** is ineffective and insufficient, given the rapidly growing immigration of people moving to Montana (2nd highest rate of immigration in 2022) and historic noncompliance of the Food Storage Act on federal lands.

Recreational use on state and federal lands

These are not MDFWP lands. They are MDFWP-managed state lands that belong to all Montanans. They often abut other DNRC-managed state lands and federal lands managed by the USFWS (national refuges, federally designated wilderness), Forest Service-managed lands (federally designated wildernesses, wilderness study areas, national recreation areas, and other national forest lands adjacent to state-managed public lands), BLM-managed public lands (federally designated wildernesses, wilderness study areas, national recreation areas, and other BLM-managed land adjacent to state-managed public lands), and NPS-managed lands such as Glacier National Park and Yellowstone National Park (recommended wilderness designation and national recreation areas).

page 15 - Currently FWP efforts for educating recreationists is inadequate and insufficient due to budget constraints, with other priorities often taking precedence. What percentage of the overall MDFWP budget is currently spent on educating recreationists, including hunters and anglers? How effective are efforts to educate recreationists on food storage, use of bear spray vs. shooting

first and asking questions later, camping practices, and leaving camps unattended in grizzly bear habitat on state-managed lands? Where is the data to back up these recommendations? How many MDFWP personnel are in place *“to continue and expand its program of educating recreationalists, including hunters, about recreating safely in grizzly bear country?”* Why weren’t all the recommendations from the Governor’s Grizzly Bear Advisory Council adopted in the Statewide Grizzly Bear Management Plan? (MDFWP, EIS, Executive Summary, 2022).

Human population estimates are already outdated (2021). Montana has experienced an influx of new residents. According to the Bureau of Business and Economic Research, University of Montana, *“Montana’s net migration rate is now three times higher than the average for the last two decades.”* Montana’s population grew 1.5% in 2022, according to new annual state population estimates released by the U.S. Census Bureau (US Census Bureau, December 2022). Montana ranked among the top 10 states for percentage growth, currently rated as the second of these 10 states experiencing the highest immigration of growth. This growth will have profound impacts on maintaining a viable grizzly bear population due to housing demands, recreation demands, and other amenities.

page 26 - Why do people move to Montana? Lifestyle and need for more space, and public land access to pursue recreational opportunities in designated wilderness, wilderness study areas, and national parks, often in prime grizzly bear habitat. As the EIS states, *“Recreationists have largely unhindered access to millions of acres of undeveloped land. Some of this land is currently, or based on documented trends of increasing distribution will be, occupied by grizzly bears. As bear numbers and distribution increase, and the number of outdoor enthusiasts grow, contact and interaction between grizzly bears and people engaged in outdoor activities is likely to increase”* (MDFWP, EIS, Executive Summary, 2022). Increasing development of wildlife habitat and the accelerating pressure on our wild lands by more and more people and recreationists each year diminishes the grizzly’s chances of survival (Montana Public Radio, 2023). Delisting and adding trophy hunting simply seals their fate. The EIS does not clearly state how they will effectively inform, educate, and enforce measures to reduce human/bear conflicts and how they will fund these efforts.

Meanwhile efforts on many national forests in Montana are focused on expanding recreational opportunities adjacent to state-managed lands that are within critical grizzly bear habitat. For example, *“There has been an increase of Special Use Permits issued on the Flathead National Forest. Most have been issued using Categorical Exclusions without cumulative effects analysis”* (Bader, Hammer, & Montgomery, 2022). This includes commercially sponsored foot races, snowmobile guiding, snow biking, cross country and downhill skiing, mountain biking and motorized travel (e-bikes, dirt bikes, motorcycles, and 4-wheelers). There is an increase in year-round commercial outfitting requests by the outfitting industry, and expansion of Holland Lake Lodge on the Flathead Forest *“into a four-season resort. This proposal would at least triple overnight visitor capacity while also increasing day use through partnerships with commercial guides and outfitters and expanding both overnight and day use into winter which may cause*

disturbance to grizzly bear denning habitat. It would also nearly double the acreage covered by the current lodge permit area.” (Bader et al. 2022).

page 26-Value orientations of Montanans relevant to grizzly bear management was not specifically measured and is outdated (Manfredo et al. 2009, 2018) given the rapid growth in population due to the influx of new residents in the past two decades. It does not adequately cover the knowledge, attitudes, and beliefs of newcomers to Montana since the onset of COVID in 2020.

According to Hammitt et al. (2015) *“The intrusion of humans into wildlife habitats during recreational activities can cause various types and levels of change in both animals and their habitat. First, the normal behavior of animals may be altered to various degrees, all the way from habituation to slight modifications to migration from impacted sites. Secondly, animals may be displaced completely to a new habitat or, in the case of sport hunting, and traveling, displaced from the population. Thirdly, all these impacts can cause a reduction in the reproductive level of many species. Ultimately, these impacts result in a change in the species composition and structure of wildlife populations”* (p. 59-60).

Grizzly Advisory Council Recommendations

According to members of the Grizzly Bear Advisory Council grizzly bear managers are not consulted in the planning process for recreational trails in grizzly bear habitat on state and federally-managed lands. There should be consultation with grizzly bear managers early in the planning process or even before the process begins. The Council’s recommendations include:

Public and State Land

a. In areas where grizzly bears are or may be present:

i. Relevant agencies should create and enforce consistent food storage requirements across state and federal lands;

ii. Relevant agencies should work with partners to make bear resistant infrastructure available at all federal, state, and local campgrounds and other public recreation areas;

iii. FWP and relevant agencies should continue to work with partners to research and closely monitor impacts to grizzly bears from road densities and other human activity on public and state lands; and

iv. FWP should coordinate with public land managers to develop plans to address the general and seasonal impacts to wildlife from recreational use and to prevent conflicts between grizzly bears and people on the landscape, including but not limited to the following:

- 1. Encourage reduced maximum group sizes for public and special event use in recovery ecosystems;*
- 2. Encourage temporary trail closures and limit special use permits in areas with critical habitat conditions during appropriate times of year;*
- 3. Consider future areas of connectivity in land management decisions;*
- 4. Require that commercial or special use permit applications include specific plans to meet food storage order regulations, manage and reduce conflicts, contain attractants, and minimize impacts to grizzly bear habitat and food resources;*
- 5. Consider identifying areas of Montana with minimal impacts to grizzly bear habitat and minimal risk of conflict to proactively prepare for participation in recreation planning processes; and*
- 6. Ensure appropriate and timely analysis for new and proposed recreation activities in designated core grizzly habitat and connectivity areas on public lands and move or reroute activities as determined by the analysis.” (Governor’s Grizzly Bear Advisory Council, 2020, p. 11).*

All of these recommendations should be included in the FINAL Montana Grizzly Bear Management Plan. The literature cited in this section on recreation supports these recommendations for maintaining a viable grizzly bear population in Montana now and for future generations.

Wilderness and Wilderness Study Areas

The Draft Plan and DEIS are woefully inadequate on their descriptions and analyses of designated Wilderness and Congressionally-designated Wilderness Study Areas (WSAs), and how these areas can play roles in grizzly recovery and long-term survival. Both the Final Plan and Final EIS must significantly beef up their analyses to adequately address Wilderness.

A large part of the grizzly recovery areas and connectivity areas are in Wilderness or WSAs, which are a unique resource in and of themselves that needs special consideration in the management plan. Wildernesses have their own safeguards, requiring a lighter hand in grizzly management. The Grizzly Plan needs to specifically address this. The discussion below uses “Wilderness” to refer to both congressionally designated Wildernesses and Wilderness Study Areas.

- The Draft Plan has no section or subsection on Wilderness. This must be rectified in the Final Plan.

- The Draft EIS has a short section (pages 145-150) entitled “Access to and Quality of Recreational and Wilderness Activities” that narrowly focuses on human recreation and activities in Wilderness, but nothing other than this narrow look at human access and recreation in Wilderness.

- Federally-designated Wilderness is far more than just human access and recreation. Wilderness is a special place, encompassing a wide range of tangible and intangible values. Wilderness should be a sanctuary for grizzlies, where grizzlies are free of human controls and manipulations.

- Federal Wildernesses are designated by the U.S. Congress under the 1964 Wilderness Act (16 U.S.C. 1133-1136). Wildernesses are managed by the four federal agencies that administer them, and the federal government (not the State of Montana) ultimately controls wildlife on federal lands. Montana’s grizzly plan needs to recognize the legal obligations of federal land managers to protect each area’s wilderness character by ensuring that management of grizzlies is compatible with the 1964 Wilderness Act and federal agency management policies. For example, Forest Service policy for fish and wildlife management in Wilderness states, “*Provide an environment where the forces of natural selection and survival rather than human actions determine which and what numbers of wildlife species will exist.*” (Forest Service Manual 2323.31).

Grizzly bear management in Wilderness should focus on managing people, including researchers, outfitters, and managers themselves, and leave the grizzlies alone. FWPs currently does not have a trapping focus within the Bob Marshall Wilderness complex (Bader and Sieracki 2022) due to lack of access, expense and success. This should become a policy. As the U.S. Fish and Wildlife Service has recognized in its wilderness management policies:

In wilderness, we do not adjust nature to suit people, but adjust human use and influences so as not to alter natural processes. We strengthen wilderness character with every decision to forego actions that have physical impact or would detract from the idea of wilderness as a place set apart, a place where human uses, convenience, and expediency do not dominate. We preserve wilderness character by our compliance with wilderness legislation and regulation, but also by imposing limits on ourselves. (USFWS Natural and Cultural Resources Management, Part 6-10 Wilderness Stewardship.)

Specific requirements in the grizzly management plan should include:

- Use of helicopters or motor vehicles is prohibited in designated Wilderness. These restrictions must be followed for research, translocations, and any other activities in Wilderness. Translocations should occur outside Wilderness.

- No capturing, collaring, darting, or other invasive management practices. The State should let wild grizzlies be truly wild in Wilderness. Radio collars are a form of trammeling and a type of installation that is prohibited by the Wilderness Act. Bears should be free from that kind of human manipulation and control within Wilderness.

- Radio transmissions from collars may negatively affect grizzlies just as electromagnetic transmissions can negatively affect some humans. Grizzlies should be free of such human electromagnetic intrusions in Wilderness.

- The State of Montana must use only non-invasive research methods for grizzlies in Wilderness, such as visual observations, hair analysis, fecal samples and analysis, and so forth.

- Special regulations are needed for outfitters and hunters in grizzly country. Because outfitter camps (and some non-outfitted camps) remain in place for long periods of time, special food storage and other requirements are needed to prevent conflicts with grizzlies. All hunters in Wilderness (and elsewhere in grizzly country) should be required to carry bear spray and to have it immediately accessible, since encounters with hunters are one of the leading causes of grizzly deaths in the backcountry.

- The State of Montana should encourage the federal agencies to not build new trails (or re-open long-closed trails) in grizzly habitat, and to limit trail densities in Wilderness and WSAs to provide more secure habitat. Research shows that bears avoid trails, more trails mean less secure habitat and more harassment of bears.

- High-use non-motorized trails in Wilderness should be buffered to 500m for the purposes of calculating secure core habitat, as they previously were.

Relocation Sites

The Draft Plan does not address the pressing issue of non-conflict bears that are accidentally or pre-emptively trapped in areas near the Bitterroot Ecosystem or in connectivity zones outside FWP defined “Occupied Areas.” One instance occurred in 2018 when a non-conflict grizzly bear was captured on a Stevensville golf course (Bitterroot Star 2018). This created an immediate need for a relocation site in the area that would keep the bear in its current range to encourage connectivity. Agencies could not agree on a nearby location. Subsequently, the bear was relocated to the NCDE, became a conflict bear, and was eventually killed by bear managers.

In 2022, two non-conflict grizzly bears were pre-emptively trapped in the Bitterroot Valley close to and just downstream of the Bitterroot Ecosystem. According to an account related during the NCDE subcommittee meeting (Dec 1-2, 2022), release on site was planned, but *“the agencies did not agree.”* Consequently, the bears were taken across the Bitterroot River to the Sapphires

and the only approved relocation site anywhere near the area. The bears are now on the Eastern Front where, under the Draft Plan, they would be subject to harsher management should a conflict occur. According to the Draft Plan, the Welcome Creek relocation site would continue to be the only alternative should another grizzly bear appear in the Bitterroot Valley and be trapped inadvertently or otherwise. Bears inadvertently trapped should be released as close as possible to the capture site.

Another recent incident in Idaho occurred when a non-conflict grizzly sow and cubs were killed by the Idaho Fish and Game Commission because “there were no relocation sites available.” (Idaho Fish & Game Press Release 2022). The Draft Plan touts the importance of connectivity, but it does not address this issue.

Hertel et al. (2019) discovered that explorer bears are important to connectivity and persistence of the species, “Bolder individuals seem to be more tolerant towards human encroachment and move more easily through human-modified landscapes (Holtmann et al., 2017, Lowry et al. 2012, Hertel et al. 2019) which has implications for dispersal and population connectivity. The bears that are roaming into areas in between recovery zones are highly important and should be encouraged, not killed or returned to “Occupied areas.” The Draft Plan admits that moving non-conflict bears outside of occupied habitat *“would not be applicable to decisions needing immediate resolution.”* Page 37. Leaving these bears without recourse should they venture into connectivity areas not dubbed “Occupied” is nothing more than a Sisyphean approach to promote the recovery of grizzly bears in Montana.

The Draft Plan on page 9 states FWP will *“continue to engage with the Commission to gain pre-approval of new sites within Occupied range to which grizzly bears could be moved but would not seek approval of new release sites beyond the most recently updated Occupied range.”* The description of how Occupied range is determined intentionally *“excludes occasional observations that are separated from the contiguous Occupied area by unoccupied areas (i.e., outliers).”* Page 96. First, contiguity is not necessary and should not be a deciding factor when determining occupied areas and subsequent release sites. Peck et al. (2017) found that natural connectivity between the NCDE and the GYE cannot be possible without islands of populations in between. The Draft Plan states, *“collared bears that make particularly notable exploratory movements are either censored from the calculations, or their movement track is rarified to reduce the influence of such movements on the resultant map.”* Page 96. This exclusion not only ignores the importance of “bolder” bears as described by Hertel et al. (2019), it does not take into consideration the unknown movements of uncollared bears that might replicate these notable exploratory movements on a regular basis.

Using the U.S. Fish & Wildlife Service May Be Present map instead of FWPs “occupied” map would eliminate this issue. It would allow relocation sites in areas where grizzly bears are roaming and provide support for outlier, exploratory bears that could naturally populate the Bitterroot Ecosystem and are the populations best bet for continued persistence and connectivity.

The U.S. Fish & Wildlife Service 5-year review describes the Bitterroot Ecosystem as vital to the recovery of grizzly bears in the lower 48, but the Draft Plan does not support natural colonization of the Bitterroot Ecosystem by supporting outlier bears with relocation sites near the areas they are found.

The Draft Plan does not explain how relocation sites would be determined, nor is there an explicit definition of a “*commission-approved release site*.” The process by which release sites are determined must be clear and the criteria used to approve or disapprove release sites must be described in detail, including the frequency of the site review and revision. The process, the criteria, and all decisions concerning relocation sites must be publicly reported and the frequency of relocation site review and revision should be determined in the Final Plan.

The Draft Plan fails to guarantee monitoring of bears outside recovery zones, instead this work would only be prioritized if it “*becomes feasible*.” Page 43. The Draft Plan claims that “*A remaining challenge is ensuring long-term connectivity between those zones across human-populated areas ... Fortunately, connectivity can be attained by a lower number of dispersed animals navigating through those areas*.” Page 5. Yet, nothing in the Draft Plan studies or provides support for these dispersed animals. On the contrary, they are excluded from consideration. The first line of support for these outliers, would be sufficient relocation sites in the areas between recovery zones to allow for release on site or short distance relocation wherever the bears trapped, inadvertently or otherwise.

Summary

The Draft Plan is an inadequate regulatory mechanism with several inadequate regulatory mechanisms within it. This Draft Plan must be withdrawn and redone to correct the myriad deficiencies. The State of Montana and FWPs can do much better when it comes to ensuring the long-term persistence of the grizzly bear, the State Animal of Montana.

Sincerely,

Patty Ames, President
Flathead-Lolo-Bitterroot Citizen Task Force
Missoula

Lizzy Pennock, Carnivore Coexistence Attorney
WildEarth Guardians
Missoula

George Nickas, Executive Director
Wilderness Watch
Missoula

Jocelyn Leroux, Washington and Montana Director
Western Watersheds Project
Missoula

Jim Miller, President
Friends of the Bitterroot
Hamilton

Keith Hammer, Chair
Swan View Coalition
Kalispell

Kari Gunderson, PhD
LLC Montana Wilderness Education School
Swan Valley

Jeff Juel, Montana Policy Director
Friends of the Clearwater
Missoula

Chris Bachman, Conservation Director
Yaak Valley Forest Council
Yaak Valley

Denise Boggs, Conservation Director
Conservation Congress
Great Falls

Connie Poten
Footloose Montana
Missoula

Adam Bronstein, President
Gallatin Yellowstone Wilderness Alliance
Bozeman

Brian L. Horejsi, PhD
Speak Up for Wildlife Foundation
Penticton, B.C.

Mike Bader, consultant
Ecological Research Services
Missoula

Barrie K Gilbert, PhD, Senior Scientist (ret.)
Dept. of Wildland Resources
Utah State University, Logan, UT

Clinton Nagel, President
Gallatin Wildlife Association
Bozeman

Jennifer Watson
NW Great Old Broads for Wilderness
Missoula

Nancy Ostlie
Great Old Broads for Wilderness
Bozeman

Arlene Montgomery
Friends of the Wild Swan
Bigfork

David Mattson, PhD
Field Team Leader, Yellowstone Grizzly Bear Study,
USGS (ret.) Livingston

Lee H Metzgar, PhD
Director, Zoology and Biology Programs(ret.)
University of Montana

Frank Lance Craighead, PhD
Director Emeritus, Craighead Institute
Bozeman

Blake Nicolazzo
Missoula for Bears
Missoula

Doug Peacock, Chair
Save the Yellowstone Grizzly
Livingston

Max Hjortsberg, Conservation Director
Park County Environmental Council
Livingston

Wendy Keefover, Senior Strategist Native
Carnivore Protection, Wildlife Department
The Humane Society of the United States

Kristine Akland, Northern Rockies Senior
Attorney, Endangered Species Program
Center for Biological Diversity
Missoula

Literature Cited

Allendorf FW, Ryman N. 2002, 2017. The role of genetics in population viability analysis. In: Beissinger SR, McCullough ER, editors. 1st and 2nd eds. Population Viability Analysis. Chicago, IL: University of Chicago Press. p 50-85.

Allendorf FW, Metzgar LH, Horejsi BL, Mattson DJ, Craighead FL. 2019. The status of the grizzly bear and conservation of biological diversity in the northern Rocky mountains. 21p.
www.montanaforestplan.org

Anderson, A. K., Waller, J. S., Thornton, D. H. 2023. Partial COVID-19 closure of a National Park reveals negative influence of low-impact recreation on wildlife spatiotemporal ecology. Scientific Reports 13(1). <https://doi.org/10.1038/s41598-023-27670-9>

Artelle, K.A., S.C. Anderson, J.D. Reynolds, A.B. Cooper, P.C. Paquet and C.T. Darimont. 2016. Ecology of conflict: marine food supply affects human-wildlife interactions on land. Scientific Reports 6, 25936; doi: 10.1038/srep25936.

Bader M, P Sieracki. 2022. Grizzly bear denning habitat and demographic connectivity in northern Idaho and western Montana. Northwestern Naturalist 103(3):209-225.

Bader M, K Hammer, A Montgomery. 2022. Backtracking on Grizzly Bear Recovery in the Northern Continental Divide Ecosystem. 4p.

Bader, M. 2000a. Wilderness-based ecosystem protection in the northern Rocky Mountains of the U.S. Pages 99-110 in: Wilderness Science in a Time of Change Conference. USDA Forest Service, Rocky Mountain Research Station. Ogden, UT.

Bader, M. 2000b. Spatial needs of grizzly bears in the U.S. northern Rockies. Peer-reviewed spoken presentation at the Society for Conservation Biology 2000 Conf. 25 p.

Bangs, E., Jiminez, M., Niemeyer, C., Fontaine, J., Collinge, M., Krischke, R., Handegard, L., Stone, S. 2006. Non-lethal and lethal tools to manage wolf-livestock conflict in the northwestern United States. Proceedings of the Vertebrate Pest Conference. 22:7–16, available at <https://doi.org/10.5070/V422110170>

Barnes, M. 2015. Livestock management for coexistence with large carnivores, healthy land and productive ranges. Keystone Conservation, available at: <https://wolfwatcher.org/wp-content/uploads/2015/09/Livestock-Manangement-forCoexistence-with-Large-Carnivores-Healthy-Land-Productive-Ranches.pdf>

Bellemain, E., Swenson, J. E. and Taberlet, P. 2006. Mating strategies in relation to sexually selected infanticide in a non- social carnivore: the brown bear. Ethology 112(3):238-246.

Bischof, R., Bonenfant, C., Rivrud, I. M., Zedrosser, A., Friebe, A., Coulson, T. and Swenson, J. E. 2018. Regulated hunting re-shapes the life history of brown bears. Nature Ecology & Evolution 1(2):116-123.

Bombieri, G. and 24 other authors. 2019. Brown bear attacks on humans: a worldwide perspective. *Scientific Reports* 9:8573.

Bonnin, N, Stewart, F. A., Wich, S. A, Pinteá, L, Jantz, S. M, Dickson, R, Bellis, J, Chitayat, A, Ingram, R, Moore, R.J, Piel, A.K., Modelling landscape connectivity change for chimpanzee conservation in Tanzania, *Biological Conservation* Volume 252, 2020, 108816, ISSN 0006-3207, <https://doi.org/10.1016/j.biocon.2020.108816>.

Bourbonnais, M. L., Nelson, T. A., Cattet, M. R., Darimont, C. T. and Stenhouse, G. B. 2013. Spatial analysis of factors influencing long-term stress in the grizzly bear (*Ursus arctos*) population of Alberta, Canada. *PLoS One* 8(12).

Breck, S.W., Kliever, B.M., Panasci, M., Oakleaf, J., Johnson, T. 2011. Domestic calf mortality and producer detection rates in the Mexican wolf recovery area: Implications for livestock management and carnivore compensation schemes. *Biological Conservation*. 144(2):930–36, available at <https://doi.org/10.1016/j.biocon.2010.12.014>

Breck, S., Clark, P., Howery, L., Johnson, D., Kluever, B., Smallidge, S., Cibils, A. 2012. A perspective on livestock-wolf interactions on western rangelands. *Rangelands* 34(5):6-11, available at <https://doi.org/10.2111/RANGELANDS-D-11-00069.1>.

Browne-Núñez, C., Treves, A., MacFarland, D., Voyles, Z. and Turng, C. 2015. Tolerance of wolves in Wisconsin: a mixed-methods examination of policy efforts on attitudes and behavioral inclinations. *Biological Conservation* 189:59-71.

Bureau of Business and Economic Research, University of Montana. Retrieved from: <https://www.bber.umt.edu/>

Carroll C, RF Noss and PC Paquet. 2001. Carnivores as focal species for conservation planning in the Rocky Mountain region. *Ecological Applications* 11(4):961-980.

Cattett M, J Boulanger, G Stenhouse, RA Powell, and MJ Reynolds-Hogland. 2008. An evaluation of long-term capture effects in ursids: implications for wildlife welfare and research. *Journal of Mammalogy* 89(4): 973-990.

Cattett M, G Stenhouse and T Bollinger. 2008. Exertional Myopathy in a Grizzly Bear (*Ursus arctos*) Captured by Leghold Snare. *Journal of Wildlife Diseases* 44(4):973-978.

Chapron, G. and Treves, A. 2016. Blood does not buy goodwill: allowing culling increases poaching of a large carnivore. *Proceedings of the Royal Society B: Biological Sciences*, 283(1830), 20152939.

Creel S. 2022. Methods to estimate population sizes of wolves in Idaho and Montana. Department of Ecology, Montana State University. 17p.

Craighead, FL, and WP McCrory. 2018. Potential Impacts of the Proposed Pacific Northwest National Scenic Trail Route on Threatened Grizzly Bears and Their Recovery in the Yaak Watershed Area, NW Montana. Yaak Valley Forest Council, 2018. yaakvalley.org/download/craighead-mccrory-final-yaak-report/?wpdmdl=1261&refresh=63449b746cbad1665440628. Accessed 4 Nov. 2022.

- Daily Montanan. 2023. Cabinet-Yaak grizzly bear population is crashing and we're trying to stop it. (2023, January 15). <https://dailymontanan.com/2023/01/15/cabinet-yaak-grizzly-bear-population-is-crashing-and-were-trying-to-stop-it/>
- Darimont, C.T., Hall, H., Eckert, L., Mihalik, I., Artelle, K., Treves, A., Paquet, P.C. 2020. Large carnivore hunting and the social license to hunt. *Conservation Biology* 35 (4) 1111. Available at <https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/cobi.13657>.
- Doak, D. F. and K. Cutler. 2014. Reevaluating evidence for past population trends and predicted dynamics of Yellowstone grizzly bears. *Conservation Letters* May/June 2013, 7(3):312–322.
- Ebinger, M. R., Haroldson, M. A., van Manen, F. T., Costello, C. M., Bjornlie, D. D., Thompson, D. J. and White, P. J. 2016. Detecting grizzly bear use of ungulate carcasses using global positioning system telemetry and activity data. *Oecologia*, 181(3):695-708. <https://link.springer.com/article/10.1007/s00442-016-3594-5>.
- Elfström, M., Zedrosser, A., Støen, O.G., and Swenson, J.E. 2014. Ultimate and proximate mechanisms underlying the occurrence of bears close to human settlements: review and management implications. *Mammal Review* 44(1):5-18.
- Ford AT, Barrueto M, Clevenger AP. 2017. Road mitigation is a demographic filter for grizzly bears. *Wildlife Society Bulletin* 41(4):712–719.
- Frank, S. C., Ordiz, A., Gosselin, J., Hertel, A., Kindberg, J., Leclerc, M. and Zedrosser, A. 2017. Indirect effects of bear hunting: a review from Scandinavia. *Ursus* 28(2):150-164.
- Frank, S. C., Leclerc, M., Pelletier, F., Rosell, F., Swenson, J., Bischof, R. and Zedrosser, A. (2018). Sociodemographic factors modulate the spatial response of brown bears to vacancies created by hunting. *Journal of Animal Ecology* 87:247-258.
- Garshelis, D.L., K. V. Noyce, and V. St-Louis. 2020. Population reduction by hunting helps control human–wildlife conflicts for a species that is a conservation success story. *PlosOne* 15(8): e0237274. <https://doi.org/10.1371/journal.pone.0237274>.
- Gosselin, J., Zedrosser, A., Swenson, J. E. and Pelletier, F. 2015. The relative importance of direct and indirect effects of hunting mortality on the population dynamics of brown bears. *Proceedings of the Royal Society of London B* 282, (1798), 20141840.
- Gosselin, J., Leclerc, M., Zedrosser, A., Steyaert, S. M., Swenson, J. E. and Pelletier, F. 2017. Hunting promotes sexual conflict in brown bears. *Journal of Animal Ecology* 86(1):35-42.
- Governor’s Grizzly Bear Advisory Council. (2020). Recommendations and Input on the Future of Grizzly Bear Management and Conservation in Montana. Final Report. Retrieved from: fwp.mt.gov/gbac
- Graves T, Chandler RB, Royle JA, Beier P, Kendall KC. 2014. Estimating landscape resistance to dispersal. *Landscape Ecology* 29:1201-1211.

- Graham, D. C. 1978. Grizzly bear distribution, use of habitats, food habits and habitat characterization in Pelican and Hayden Valleys, Yellowstone National Park. M.S. Thesis, Montana State University, Bozeman, Montana.
- Greer, K.R. 1972. Grizzly Bear Mortality and Studies in Montana, Panel 1: The Ecology, Population Characteristics, Movements and Natural History of Bears. Montana Fish and Game Department. 2:53-66.
- Governor's Grizzly Bear Advisory Council. 2020. Recommendations and Input on the Future of Grizzly Bear Management and Conservation in Montana. Final Report. Retrieved from: fwp.mt.gov/gbac
- Gunther K. 1990. Visitor impact on grizzly bear activity in Pelican Valley, Yellowstone National Park. Bears: Their Biology and Management (8):73-78. International Conference on Bear Research and Management.
- Hammit, W.E., Cole, D.N. and Monz, C. A. 2015. Wildland Recreation. Ecology and Management. Third Edition. John Wiley & Sons, Ltd. UK.
- Herrero, S. 2002. Bear attacks: their causes and avoidance. Revised edition. Lyons Press, Guilford, Connecticut.
- Herrero, S. 1972. Aspects of the evolution and adaptation in American black bears (*Ursus americanus* Pallas) and brown and grizzly bears (*U. arctos* Linne.) of North America. International Conference of Bear Research and Management 2: 221-231.
- Hertel, A. G., Leclerc, M Warren, D, Pelletier, F, Zedrosser, A, Mueller, T. 2019. Don't poke the bear: using tracking data to quantify behavioural syndromes in elusive wildlife, Animal Behaviour 147: 91-104, ISSN 0003-3472, <https://doi.org/10.1016/j.anbehav.2018.11.008>.
- Hogberg, J., Treves, A., Shaw, B., and Naughton-Treves, L. 2016. Changes in attitudes toward wolves before and after an inaugural public hunting and trapping season: early evidence from Wisconsin's wolf range. Environmental Conservation, 43(1):45-55.
- Huygens, O.C., FT van Manen, DA Martorello, H Hayashi and J Inshida. 2004. Relationships between Asiatic black bear kills and depredation costs in Nagano Prefecture, Japan. Ursus 15(2):197-202.
- Institute for Tourism & Recreation Research, University of Montana. 2022. Montana Travel Experience Survey, Public Lands Experience. Retrieved from: <http://itr.umt.edu/Publications/recent-findings.php>
- Kamath, P.L., M. A. Haroldson, G. Luikart, D. Paetkau, C. Whitman, and F.T. van Manen. 2015. Multiple estimates of effective population size for monitoring a long-lived vertebrate: an application to Yellowstone grizzly bears. Molecular Ecology 24:5507–5521.
- Kasworm WF, TG Radandt, JE Teisberg, T Vent, A Welander, M Proctor, H Cooley and JK Fortin-Noreus. 2022. Cabinet-Yaak Grizzly Bear Recovery Area 2020 Research and Monitoring Progress Report. U.S. Fish & Wildlife Service. Missoula, MT.

Kasworm WF, TG Radandt, JE Teisberg, T Vent, A Welanders, M Proctor, H Cooley and JK Fortin-Noreus. 2021. Cabinet-Yaak Grizzly Bear Recovery Area 2020 Research and Monitoring Progress Report. U.S. Fish & Wildlife Service. Missoula, MT. 108p.

Kendall KC, AC Macleod, KL Boyd, J Boulanger, JA Royle, WF Kasworm, D Paetkau, MF Proctor, K Annis, TA Graves. 2015. Density, distribution, and genetic structure of grizzly bears in the Cabinet-Yaak Ecosystem. *Journal of Wildlife Management* 80(2):314-331.

Lamb C, L Smit, B McLellan, LM Vander Vennen and M Proctor. 2022. Considerations for furbearer trapping regulations to prevent grizzly bear toe amputation and injury. *Wildlife Society Bulletin* e1344.

Lance, N.J., Breck, S.W., Sime, C., Callahan, P., Shivik, J.A. 2010. Biological, technical, and social aspects of applying electrified fladry for livestock protection from wolves (*Canis lupus*). *Wildlife Research* 37(8):708–14, available at https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=2257&context=icwdm_usdanwrc

Leclerc, M., Frank, S. C., Zedrosser, A., Swenson, J. E., and Pelletier, F. 2017. Hunting promotes spatial reorganization and sexually selected infanticide. *Scientific Reports* 7, 45222.

Lewis, M. S., G. Pauley, Q. Kujala, J. Gude, Z. King, and K. Skogen. 2012. Selected results from four separate surveys of resident Montanans regarding Montana's wolf hunt. HD Unit Research Summary 33. Montana Fish, Wildlife and Parks, Helena, MT.

Lossa G, CD Soulsbury and S Harris. 2007. Mammal trapping: a review of animal welfare standards of killing and restraining traps. *Animal Welfare* 16:335-352.

Lowry H, A Lill, BBM Wong. 2012. Behavioural responses of wildlife to urban environments. *Biological Reviews* 88(3):537-549.

Mace RD and JS Waller. 1997. Denning Ecology of Grizzly Bears in the Swan Mountains, Montana. Final Report: Grizzly Bear Ecology in the Swan Mountains, Montana:36-41. Montana Department of Fish, Wildlife and Parks. Helena, MT. 191p.

Mattson, DJ, 2020. Efficacies and Effects of Sport Hunting Grizzly Bears. Report GBRP-2020-1. 66p.

Mattson DJ. 2019. Heart of the Grizzly Nation. Report GBRP-2019-2. 79p.

Mattson DJ. 2019. Effects of Pedestrians on Grizzly Bears. An Evaluation of the Effects of Hikers, Hunters, Photographers, Campers, and Watchers. Report GBRP-2019-3. 51p.

Mattson D, Herrero S, Wright RG, Pease CM. 1996. Designing and managing protected areas for grizzly bears: how much is enough? In: Wright, RG, editor. *National Parks and Protected Areas: Their Role in Environmental Protection*, Cambridge, MA: Blackwell Science. p 133-164.

McClellan, B.N. 1994. Density-dependent population regulation of brown bears. Pages 15-24 In: *Density-Dependent Population Regulation of Black, Brown and Polar Bears*. Ninth Intl. Conf. on Bear Res. Manage. Monograph Series No. 3. M. Taylor (ed.) 43 p.

McLellan BN, G Mowat and CT Lamb. 2018. Estimating unrecorded human-caused mortalities of grizzly bears in the Flathead Valley, British Columbia, Canada. *PeerJ* 6: e5781.

McLellan BN, Hovey FW. 2001. Natal dispersal of grizzly bears. *Canadian Journal of Zoology* 79:838-844.

Metzgar LH, Bader M. 1992. Large mammal predators in the northern Rockies: grizzly bears and their habitat. *Northwest Environmental Journal* 8(1):231-233.

Middleton, A. D., Morrison, T. A., Fortin, J. K., Robbins, C. T., Proffitt, K. M., White, P. J., and Kauffman, M. J. 2013. Grizzly bear predation links the loss of native trout to the demography of migratory elk in Yellowstone. *Proceedings of the Royal Society of London B: Biological Sciences*, 280(1762), 20130870. <https://royalsocietypublishing.org/doi/full/10.1098/rspb.2013.0870>

Miller, A.B., King, D, Rowland, Mr. Chapman, J, Tomosy, M., Liang, C., Abelson, E. & Truex, R.L. 2020. Sustaining Wildlife with Recreation on Public Lands: A Synthesis of Research Findings, Management Practices, and Research Needs. USDA, Forest Service, Pacific Northwest Research Station. Gen. Tech. Report PNW-GTR-993.

Miller B, Ralls K, Reading RP, Scott, JM, Estes J. 1999. Biological and technical considerations of carnivore translocation: a review. *Animal Conservation* (1999)(2):59-68.

Miller PS, Lacy RC. 2005. VORTEX: A Stochastic Simulation of the Extinction Process. Version 9.50. User's manual. Conservation Breeding Specialist Group (SSC/IUCN) Apple Valley, MN.

Milner, J. M., Nilsen, E. B., and Andreassen, H. P. 2007. Demographic side effects of selective hunting in ungulates and carnivores. *Conservation Biology* 21(1):36-47.

Montana Department of Fish, Wildlife and Parks. 2018. Incidental Captures of Wildlife and Domestic Dogs in Montana, 2012-2017. Helena, MT. 6p.

Montana Department of Fish, Wildlife and Parks. 2022. Wolf/Furbearer/Trapping. Trapping and Hunting Regulations. Helena, MT. 28p.

Montana Department of Fish, Wildlife and Parks. 2022. Excel Database of Non-Target Captures 2018-2022.

Montana Department of Fish, Wildlife, & Parks. 2022. Montana Grizzly Bear Management Plan. Environmental Impact Statement. Executive Summary.

Montana Public Radio. January 13, 2023. Aaron Bolton. Even grizzly bears are getting priced out as Montana real estate booms. Retrieved from: <https://www.mtpr.org/montana-news/2023-01-13/even-grizzly-bears-are-getting-priced-out-as-montana-real-estate-booms>

- Newmark WD, Halley JM, Beier P, Cushman SA, McNeally PB, Soule' ME. 2023. Enhanced regional connectivity between western North American national parks will increase persistence of mammal species diversity. *Scientific Reports* (2023) 13:474.
- O'Grady JJ, Brook BW, Reed DH, Ballou JD, Tonkyn DW, Frankham R. 2006. Realistic levels of inbreeding depression strongly affect extinction risk in small populations. *Biological Conservation* 133:42-51.
- Ordiz, A., Støen, O.G., Delibes, M., and Swenson, J.E. 2011. Predators of prey? Spatio-temporal discrimination of human-derived risk by brown bears. *Oecologia* 166(1):59-67.
- Ordiz, A., Støen, O.G., Sæbø, S., Kindberg, J., Delibes, M., & Swenson, J.E. 2012. Do bears know they are being hunted? *Biological Conservation* 152:21-28.
- Orozco, K. and Miles, N. 2013 Use of diminished whitebark pine resources by adult female grizzly bears in Togwotee Pass, Spread Creek, and Mount Leidy in the Bridger-Teton National Forest, Wyoming, 2012. Pages 45-47 in F.T. Van Manen, M.A. Haroldson and K. West (eds.).
- Peck, C. P., F. T. van Manen, C. M. Costello, M. A. Haroldson, L. A. Landenburger, L. L. Roberts, D. D. Bjornlie, and R. D. Mace. 2017. Potential paths for male-mediated gene flow to and from an isolated grizzly bear population. *Ecosphere* 8(10):e01969. 10.1002/ecs2.1969
- Pigeon KE, G Stenhouse, SD CÔTÉ. 2016. Drivers of hibernation: linking food and weather to denning behaviour of Grizzly Bears. *Behavioral Ecology and Sociobiology* 70:1745–1754.
- Pils, A., Becker, S., Frey, K. Gunther, K. Hnilicka, P., Nicholson, J., Thompson, D., Tyers, D. 2020. Recommendations for reducing bear-human conflicts and grizzly bear mortalities in the Yellowstone Ecosystem: a report to the Yellowstone Ecosystem Subcommittee.
- Proctor M, McLellan BN, Stenhouse GB, Mowat G, Lamb CT, Boyce MS. 2019. Effects of roads and motorized human access on grizzly bear populations in British Columbia and Alberta, Canada. *Ursus* (30e2):16-39.
- Proctor MF, Nielsen SE, Kasworm WF, Servheen C, Radandt TG, Machutchon AG, Boyce MS. 2015. Grizzly bear connectivity mapping in the Canada-United States trans-border region. *Journal of Wildlife Management* 79(4):544-558.
- Proctor MF, McLellan BN, Strobeck C, Barclay RMR. 2004. Gender-specific dispersal distances of grizzly bears estimated by genetic analysis. *Canadian Journal of Zoology* 82:1108-1118.
- Rochlitz I. 2010. The Impact of Snares on Animal Welfare. Chapter 1 in: OneKind Report on Snaring. Cambridge University Animal Welfare Information Service. United Kingdom. 31p.
- Sagør, J.T., JE Swenson and E T Røskaft. 1997. Compatibility of brown bear *Ursus arctos* and free-ranging sheep in Norway. *Biological Conservation* 81:91-95.

Schwartz, C.C., Keating, K.A., Reynolds, H.V., Barnes, V.G., Sellers, R.A., Swenson, J.E., Miller, S.D., McClellan, B.N., Keay, J., McCann, R., Gibeau, M., Wakkinen, W.F., Mace, R.D., Kasworm, W., Smith, R., and S. Herrero. 2003. Reproductive maturation and senescence in the female brown bear. *Ursus* 14(2): 109-119.

Schwartz, C. C., Fortin, J. K., Teisberg, J. E., Haroldson, M. A., Servheen, C., Robbins, C. T. and van Manen, F. T. 2014. Body and diet composition of sympatric black and grizzly bears in the Greater Yellowstone Ecosystem. *Journal of Wildlife Management* 78(1):68-78.
<https://wildlife.onlinelibrary.wiley.com/doi/abs/10.1002/jwmg.633>

Servheen C. 2023. Comments on Montana Statewide Grizzly Bear Management Plan. Montana Wildlife Federation January 6, 2023. 18p.

Servheen C. 2023. Transcript of Remarks of Dr. Chris Servheen to the NCDE Subcommittee 12/2/22. Transcription by Jeffries Court Reporting, Inc. Missoula, MT. 14p.

Servheen C. 2022. Anti-Predator and Anti-Science. Politically Driven Carnivore Management in Idaho and Montana Should Worry Wildlife Professionals. *The Wildlife Society*:31-35. www.wildlife.org

Servheen C and 34 others. 2022. We Cannot Support Delisting Montana Grizzly Bears Unless State Laws Are Changed. *The Missoulian*. January 7, 2022.

Servheen C et al. 2017. Board of Review Recommendations related to mountain bike safety in bear habitat based on the fatality of Mr. Brad Treat on June 29, 2016.

Servheen, C., J.S. Waller and P. Sandstrom. 2001. Identification and management of linkage zones for grizzly bears between the large blocks of public land in the Northern Rocky Mountains. *ICOET 2001 A Time for Action Proceedings*:161-169.

Shivik, J.A., Treves, A., Callahan, P. 2003. Nonlethal techniques for managing predation: Primary and secondary repellents. *Conservation Biology* 17(6):1531–37, available at <https://doi.org/10.1111/j.1523-1739.2003.00062.x>

Sime, C.A., Bangs, E., Bradley, E., Steuber, J.E., Glazier, K., Hoover, P.J., Asher, V., Laudon, K., Ross, M., Trapp, J. 2007. Gray wolves and livestock in Montana: A recent history of damage management. *Montana Fish, Wildlife & Parks*, available at <https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1206&context=wdmconference>.

Smith, T.S., Herrero, S., Debruyne, T.D., Wilder, J.M. 2010. Efficacy of Bear Deterrent Spray in Alaska. *Journal of Wildlife Management* 72(3): 640-645.

Støen, O. G., Ordiz, A., Evans, A. L., Laske, T. G., Kindberg, J., Frøbert, O., and Arnemo, J. M. 2015. Physiological evidence for a human-induced landscape of fear in brown bears (*Ursus arctos*). *Physiology & Behavior* 152: 244-248.

Stone, S.A., Breck, S.W., Timberlake, J., Haswell, P.M., Najera, F., Bean, B.S., Thornhill, D.J. 2017. Adaptive use of nonlethal strategies for minimizing wolf/sheep conflict in Idaho. *Journal of Mammalogy*.

98(1):33–44, available at <https://doi.org/10.1093/jmammal/gyw188>.

Stringham, S. F. 1980. Possible impacts of hunting on the grizzly/brown bear, a threatened species. *International Conference on Bear Research and Management* 4:337-347.

Strong, Z. Apr. 8, 2020. Comments to the Montana Grizzly Bear Advisory Council on Hunting Grizzly Bears in Montana, on behalf of the Natural Resources Defense Council.

Swenson, J.E., Sandegren, F., Söderberg, A., Björvall, A., Franzén, R. and Wabakken, P. 1997. Infanticide caused by hunting of male bears. *Nature* 386 (6624):450-451.

Swenson, J.E. 1999. Does hunting affect the behavior of brown bears in Eurasia? *Ursus* 11:157-162.

Sytsma ML, T Lewis, B Gardner, LR Prugh. 2022. Low levels of outdoor recreation alter wildlife behaviour. *People and Nature* 4(6):1547-1559.

Treves, A., KJ Kapp and DM MacFarland. 2010. American black bear nuisance complaints and hunter take. *Ursus* 21(1):30-42.

Treves, A., Naughton- Treves, L and Shelley, V. 2013. Longitudinal analysis of attitudes toward wolves. *Conservation Biology* 27(2):315-323.

U.S. Census Bureau (December 2022). Retrieved from: <https://www.census.gov/newsroom/press-releases/2022/2022-population-estimates.html>

U.S. Fish & Wildlife Service. 2022. Biological Opinion on the Clark Fork Face Project.

U.S. Fish & Wildlife Service 2021. Biological Report for the grizzly bear (*Ursus arctos horribilis*) in the Lower-48 States. Version 1.1. Missoula, MT. 370p.

U.S. Fish & Wildlife Service. 2021.
<https://www.fws.gov/sites/default/files/documents/2021%20GBRP%20Annual%20Report.pdf>

U.S. Fish & Wildlife Service. 2018. NCDE Subcommittee. Conservation strategy for the grizzly bear in the Northern Continental Divide Ecosystem. 170p. + appendices.

U.S. Fish & Wildlife Service. 1993. Grizzly bear recovery plan. 181p.

U.S. Forest Service et al. 2016. Conservation strategy for the grizzly bear in the Greater Yellowstone Ecosystem. 133p.

U.S. Public Law 88-577. The Wilderness Act of September 3, 1964. 78 Stat. 890. Retrieved from: <https://wilderness.net/practitioners/law-regulation/law/wilderness-act/default.php>

Waples RS. 2022. What is N_e , Anyway? *Journal of Heredity* 113:371-379.

Western Landowners Alliance. 2018. Reducing Conflict with Grizzly Bears, Wolves and Elk: A Western Landowner's Guide. Available at <https://westernlandowners.org/lp/reducing-conflict-with-grizzly-bears-wolves-elk/>

Wielgus, R. B., Morrison, D. E., Cooley, H. S. and Maletzke, B. 2013. Effects of male trophy hunting on female carnivore population growth and persistence. *Biological Conservation* 167:69-75.

Wielgus, R. B., Sarrazin, F., Ferriere, R. and Clobert, J. 2001. Estimating effects of adult male mortality on grizzly bear population growth and persistence using matrix models. *Biological Conservation* 98(3):293-303.

Wielgus, R. B., & Bunnell, F. L. 2000. Possible negative effects of adult male mortality on female grizzly bear reproduction. *Biological Conservation* 93(2):145-154.

Wilkinson T. 2020 Griz Expert Says ‘Mountain Bikes Are A Grave Threat To Bears.’ *Mountain Journal* 5/26/2020.

Wilson, S. M., Neudecker, G. A., and Jonkel, J. J. 2014. Human-grizzly bear coexistence in the Blackfoot River watershed, Montana: getting ahead of the conflict curve. Pages 177-214 in: S. G. Clark & M. B. Rutherford (eds). *Large carnivore conservation: integrating science and policy in the North American West*. University of Chicago Press, Chicago, Illinois.

Worley, D. E., J. C. Fox, J. B. Winters, R. H. Jacobson and K. R. Greer. 1976. Helminth and arthropod parasites of grizzly and black bears in Montana and adjacent areas. *Bears: Their Biology and Management* 3:455-464. <https://www.jstor.org/stable/3872794>.

Yellowstone grizzly bear investigations: Annual report of the Interagency Grizzly Bear Study Team, 2012. U.S. Geological Survey, Bozeman, Montana. https://www.usgs.gov/centers/norock/science/igbst-annual-reports?qt-science_center_objects=7#qt-science_center_objects.