Objections to

The Black Ram Environmental Assessment & Decision Notice
Kootenai National Forest

David J. Mattson, Ph.D.

2020

The Grizzly Bear Recovery Project

P.O. Box 2406,
Livingston,
Montana

The Grizzly Bear Recovery Project

10 November 2020

Black Ram Environmental Assessment & Decision Notice Objection

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Issues Addressed: Provisions for conserving and protecting grizzly bears

The reasons for this objection are listed below, with each objection identified by a step-down hierarchy of capital letter, number, lower-case letter. I conclude with a concise statement of proposed remedies and solutions. My objections reference numerous documents and publications. Most of these were referenced in the Black Ram Environmental Assessment or in the U.S. Fish & Wildlife Service "Biological Opinion on the Effects of the Kootenai National Forest Land Management Plan on the Grizzly Bear," dated 28 August, 2020. These referenced publications should be in the records of the Kootenai National Forest. I have also sent the documents referenced here on a flash drive that should have arrived at the office of the Objection Reviewing Officer, USDA Forest Service, Northern Region, by 13 November 2020.

Introduction

I welcome the opportunity to provide additional input on the Kootenai National Forest's proposed Black Ram Project in the form of objections that reiterate and amplify on comments I submitted 8 August 2019 high-lighting issues with the draft Environmental Assessment.

My objections to the Draft Decision Notice & FONSI (DN) for the Black Ram Project—focused on grizzly bear-related impacts—encompass not only the DN, but also the final Environmental Assessment (EA) and U.S. Fish & Wildlife Service Biological Opinion (BiOp) that the DN invokes. I include the BiOp because the DN and EA authors reference this document as if it were a definitive representation of prospective impacts and relevant science. It is neither, and hence represents a flawed underpinning for both the DN and EA.

My objections organize around several thematic problems with the DN, EA, and BiOp:

- Systematic disregard for the best available science in preference for science convenient to what appears to be a prior purpose.
- Failure to recognize that "the best available science" is, at its core, a rigorous set of methods and standards for collecting, analyzing, and interpreting data as well as critically appraising published research—and not simply a collection of published research reports and publications to be uncritically used on the basis of last in time.

- Substitution of unsubstantiated assertion for the best available science.
- Deployment of convoluted or otherwise faulty logic to serve what appears to be preordained purposes.
- Systematic failure to employ the precautionary principle in assessment of project impacts on grizzly bears with amplification rather than mitigation of risk to an acutely vulnerable population of bears in the many instances where project impacts are uncertain.
- Systematic failure to commit to any project actions that promote grizzly bear recovery other than the minimum specified in the Forest Plan—in spite of direction in the same Plan to undertake actions in excess of this minimum.
- Systematic failure to take a hard look—or, in some instances, any look—at how project-related actions will ameliorate or exacerbate the factual reasons that grizzly bears die on Forest Service jurisdictions.
- Failure to address cumulative effects on grizzly bears of on-going and foreseeable human activities and environmental change.

On a related note, the Forest Service failed in the final EA to meaningfully address my many substantive comments submitted in response to the draft EA. The Forest Service ignored some of these comments outright and for the remainder deployed assertions or circular internal references largely devoid of substance.

These thematic problems are not trivial. In one way or another they manifest a failure of the Forest Service and US Fish & Wildlife Service to fulfill legal duties and obligations specified in the Endangered Species Act and National Environmental Policy Act. As such, these problems require remedy in the form of a substantially modified EA and DN for the Black Ram Project that prospectively includes consideration of additional Alternatives (see Section I, at end).

My initial objections organize around a core structural argument deployed by the Forest Service to justify adopting Alternative 2 in the Black Ram Project DN. This core argument is fatally flawed and thus an invalid basis for judging or justifying project impacts on grizzly bears. It is not based on the best available science nor is it precautionary. Alternative 2 will merely serve to perpetuate a highly risky environment for an acutely vulnerable bear population.

The logic of the Forest Service and US Fish & Wildlife Service argument is: **(1)** Minimum security standards described in the Forest Plan are adequate for recovery of the Yaak grizzly bear population. **(2)** Little more than the minimum is thus demanded of the Forest Service. **(3)** Status of the Yaak grizzly bear population has improved since 2012. **(4)** This improvement is evidence for the adequacy of minimally fulfilling security standards. **(5)** Regardless, the U.S. portion of the Yaak/Yahk grizzly bear population is contiguous with robust grizzly bear populations in Canada. None of these contentions are valid, supported by the best available science, or consistent with a precautionary approach to recovering Yaak grizzly bears.

In what follows, I articulate major issues and related objections that bear on foundational elements of the Forest Service justification and argument for adopting Alternative 2 and for the large Black Ram EA.

A. The Yaak Population of Grizzly Bears is Acutely Vulnerable and Not Viable

As per Point D in my comments submitted during August 2019 (hereafter Comments), the Yaak population of grizzly bears is acutely vulnerable to decline and extirpation within the next 50-100 years—even accounting for grizzly bears in the contiguous Yahk population of Canada (i.e., in spite of the implicit claim on pg 31, BiOp).

The Forest Service response to this fundamentally important point amounts to: "Monitoring results indicate that the population has increased substantially since listing and the early population estimates [sic]." (p120, EA Appendix). They further reference the Introduction to the Response to Comments Section, pages 117-118, in which the Forest Service states: "More recent information (Kasworm 2019) provided from DNA analysis of hair snags from 2017 in the CYE resulted in a minimum population of at least 54 bears present during 2017."

These responses signify either a profound misunderstanding of or willful disregard for: (1) factors configuring the vulnerability of bear populations; (2) factors driving the fates of small bear populations; (3) the isolation of Yaak population from the Cabinet Mountains population; and (4) the small size and comparative isolation of the Yahk grizzly bear population in Canada. Point (4) is implicated because of numerous comments made in the EA asserting, first, that grizzly bears will be able to move freely into and out of Canada through the Project areas and, second, that this movement will implicitly make a substantial difference to status of the Yaak grizzly bear population (pgs 31 & 103, BiOp).

A.1. No Conclusions Are Warranted Regarding Growth of the Yaak Grizzly Bear Population

A.1.a. No Conclusions are Warranted Regarding Population Growth Rate Since 2012

Points A-C in my Comments thoroughly cover why no conclusions are warranted regarding growth rate for the Yaak grizzly bear population since 2012, which is when Kendall et al. (2016) produced the only reliable estimate of total number of bears in the Cabinet-Yaak Ecosystem (44-62), of which 18-22 resided in the Yaak population. Problems with methods and data debar any justifiable conclusions, including mismatch of time frames for the growth rate applied since 2012 (my Point A.1.b); the use of an overly optimistic subset of bears (*research trapped adult females*) to calculate growth rate for the *entire population* (for which Forest Service claims are being made; my Point A.1.a); the huge bounds of uncertainty attending any estimate of population growth extrapolated over such an extended period of time (my Point A.1.c); application of a retrospective growth rate to project population size; and evidence that population growth stalled rather than accelerated beginning in 2014 (my Point A.2).

The Forest Service response to these fundamentally important points was to (1) quote a verbal conversation during 2019 with Wayne Kasworm in which assertions were made that the growth rate calculated for 1983-2017 was based on methods used by other researchers and "described in peer-reviewed journal articles…" and to (2) further assert that "…the reporting and incorporated methodology used by the Forest Service, as provided by the U.S. Fish and Wildlife Service, is the best available information [sic]." (pg116, EA Appendix)

This response is disingenuous, at best, and fails to address in any way the substantive fundamentally important issues raised in my Comments.

Regarding the first part of the Forest Service response (1): None of the referenced publications on page 116 of the EA Appendix exhibited the fundamental flaws I described in my Comments. Hence, these flaws were not addressed nor sanctioned by any peer review or publication in a scientific journal. Just because an annual report (as per Kasworm et al. [2018]) used methods that are, in essence, elaborations on subtraction, addition, multiplication, and division (i.e., the basis for calculating a growth rate), this is not synonymous with addressing the problems arising from an estimate based on aged largely irrelevant data, obtained from a biased sample, attended by enormous statistical uncertainty, and used to extrapolate population size into the future. One might as well say that because cashiers use fundamentally the same mathematical constructs in a check-out lane, all sins of scientific method are absolved for an estimate of a complicated population dynamic using the same constructs of addition and subtraction.

Regarding the second part of the Forest Service response (2): Just because some fundamentally flawed and unreliable information has been published in an annual report (as per Kasworm et al. [2018]) does not legitimize adopting this information as the "best available." Use of such information, especially in light of a cogent and unaddressed critique (as per my Points A-C), is tantamount to a willful embrace of error and disregard for the precautionary principle. Under such conditions, the most defensible and "best" approach is to conclude that no conclusions are warranted regarding growth rate of the Yaak grizzly bear population since 2012.

A.1.b. No Conclusions are Warranted Regarding Change in Population Size Since 2012

Regarding a presumed improvement in status of the Yaak grizzly bear population since 2012, the Forest Service further adds on page 117 of the EA Appendix: "More recent information (Kasworm 2019) provided from DNA analysis of hair snags from 2017 in the CYE resulted in a minimum population of at least 54 bears present during 2017. A number of other bears known to exist at that time were not identified by DNA sampling, thus the absolute number was greater than 54. There is no reason to suspect that demographic rates in the Cabinets differ from the U.S. Purcell's (Yaak)."

The presumption here is that a minimum estimate of 54 bears based on a reference for which no information is provided somehow yields a total number of grizzly bears in the Cabinet-Yaak Ecosystem that is greater than the 62 constituting the upper bounds of confidence for the 2012 estimate reported by Kendall et al. (2016).

There are a number of fundamental problems with this presumption. First, the minimum number of bears reported by Kasworm et al. (2009) for the entire CYE for the period 2000-2008 (i.e., 47) is nearly identical to the total number estimated by Kendall et al. (2016; i.e., 49) for 2012, which is tantamount to saying that a more recent minimum estimate of 54 is not much different from a likely total of perhaps 56-57. Which is to say, two or three is not plausibly equivalent to "A number of other bears…".

Perhaps more problematic, Kasworm et al. (2018, pg 27) report a minimum number of 35 bears for 2016, of which 23 were documented to live in the Yaak population, in contrast to the Forest Service claim that a minimum of 54 bears lived in the ecosystem one year later (presumably this applies to 2018, as per Kasworm et al. [2020], who allotted 31 of these bears to the Yaak region). According to the Forest Service, this is a 50% jump in a one-year period for the ecosystem and a 35% increase for the Yaak region, which *prima facie* fails to pass critical scrutiny, especially when the referenced material (i.e., Kasworm [2019]) is not provided in the EA for independent evaluation. The numerous methodological problems in Kasworm et al. (2018, 2020) and uncritical, if not disingenuous, deployment of information by the Forest Service in the EA does not inspire uncritical belief in these sorts of claims.

Parenthetically, there is, in fact, every reason to conclude that demographic rates of grizzly bears in the Cabinets differ from those of grizzly bears in the Yaak given numerous and repeated statements in annual reports (most recently, Kasworm et al. [2020]; see also pg 98, BiOp) that the Cabinet Mountains population was rescued and persists only because of an aggressive augmentation program. If, indeed, vital rates did not differ between the Yaak and Cabinet populations, one would have to conclude that the Yaak population needs to be sustained by aggressive augmentation, which is contrary to most other claims made by the Forest Service in the EA.

A.1.c. Why This Matters

The Forest Service maintains that its only obligations are to comply "with Forest Plan direction," which it further maintains consist almost wholly of "indicators for Forest Plan standard, FW-STD-WL-02" consisting of "core and motorized route densities" (pg 288, EA; pg 116-117, EA Appendix). Yet these very standards are not justified by the best available and credible science (see Point C.1, below). Moreover, in a display of circular argumentation, the Forest Service (pg 290, EA) and U.S. Fish & Wildlife Service (pgs 21, 22, 93, & 103, BiOp) emphasize presumed growth in the grizzly bear population as justification for the adequacy of minimum security standards described in the Forest Plan. The US Fish & Wildlife Service even goes so far as to say that "the population is growing at an increasing trend" as justification for claims of success (pg 29 BiOp), but then shows a figure on page 30 of the BiOp showing a taper if not decline in instantaneous growth rate since 2014 (as per Point A.2 in my Comments), which renders the claim of increasing growth a contradiction of the best available information.

The upshot is, barring the repeated invocation of a single white paper reporting dated and questionable science (i.e., Wakkinen & Kasworm [1997]; see Point C.1, below), the entire edifice of claims related to adequacy of provisions in the Forest Plan for ensuring grizzly bear habitat security and benign impacts of Alternative 2 for the Black Ram Project rest, in turn, on claims regarding improvement in status of the Yaak grizzly bear population since 2012.

In other words, the Forest Service is obliged to not only address current status of the Yaak grizzly bear population, but to also do so in a precautionary credible way that gives due regard to uncertainties and probable drivers. The last point is critical because an adequate treatment of plausible causation provides important context for, in turn, addressing the adequacy of minimum habitat security standards and related impacts of the Black Ram Project on grizzly bears (see Point B, below).

A.2. The Yaak/Yahk Population of the United States & Canada is Not Viable

The U.S. Fish & Wildlife Service invokes connectivity between the Yaak grizzly bear population in the United States and the Yahk population in Canada as a basis for disingenuously implying that this connectivity alleviates concerns about status of the Threatened Yaak bears (pgs 31 & 103, BiOp). This less than transparent device is misleading.

A.2.a. The Yaak/Yahk Population is Semi-Isolated and Small

The best available information shows that the combined Yaak/Yahk grizzly bear population is less than or little more than 50 bears and is isolated to a significant extent from larger more robust grizzly bear populations in all directions. Apps et al. (2016) estimated that there were roughly 24 grizzlies in the Canadian Yahk population, which, together with the 20-31 grizzlies making some use of the Yaak area (Kendall et al. 2016, Kasworm et al. 2020), amounts to perhaps 44-55 bears. This estimate is consistent with an earlier one of roughly 44 bears for the Purcell-South Yaak transboundary population by Proctor et al. (2012).

Proctor et al. (2005, 2012, 2015, 2018) and Apps et al. (2016) also document major impediments to movement imposed by vehicular traffic and settled areas along Canada Highway 3 to the north, U.S. Highway 2 to the south, the Creston Valley to the northwest, U.S. Highway 95 to the west, and Lake Koocanusa and the surrounding industrial landscape to the east. These fracture zones are not absolute barriers to bear movements, yet sufficient to genetically and demographically differentiate grizzly bears living in the Yaak/Yahk as a separate semi-isolated population (Proctor et al. 2005, 2012, 2015, 2018; Apps et al. 2016). Only 10 bears have moved into the Yaak from elsewhere during a 30-year span of time, of which 5 were killed, which amounts to only one surviving immigrant every 6 years (from Kasworm et al. 2020). Of these, 3 were known to contribute genes to the Yaak population, amounting to one contribution every 10 years. This amounts to minimal gene flow and insufficient immigration for demographic rescue.

A.2.b. Bear Populations of Less Than 100 Individuals Are Acutely Vulnerable to Extinction

The entire corpus of research produced on viability of isolated or semi-isolated populations of bears and other large long-lived mammals shows that populations of 50-100 animals are acutely vulnerable to extinction (50-95% likely) over a relatively short period of time (100 years or less; e.g., Samson et al. [1985], Shaffer & Samson [1985], Suchy et al. [1985], Wiegand et al. [1998], Howe et al. [2007], McLellan [2020]). Mattson & Reid (1991) and Wielgus (2002) present additional evidence that grizzly bear populations of fewer than <u>200 to 450 animals</u> are at great risk and require aggressive conservation efforts or large protected areas to be rescued. More recent research shows, in fact, that demographically and genetically contiguous populations of large mammals need to number in <u>the thousands</u> to be considered viable (95-99% change of survival) over meaningful periods of time (40 generations; e.g., Reed et al. [2003]; Frankham & Brooks [2004]; O'Grady et al. [2004, 2008]; Trail et al. [2007]; Frankham et al. [2014]).

Results specific to the Yaak/Yahk grizzly bear population affirm concerns about inviability. Proctor et al. (2005, 2012) made specific reference to the threatened status of this transboundary population. Estimates of population density are also relevant, especially given that density of the Cabinet-Yaak grizzly bear population is the lowest documented for any population in North America outside of some harsh arctic environments (Kendall et al. 2016), and that density of the Yahk population is 3-4 times less than that of nearby bear populations in Canada (Apps et al. 2016). It is also noteworthy that 70% of all bears and 100% of all females in the transboundary region are direct descendants of a single female (Kasworm et al. 2018), which highlights the extent to which the fate of a single individual can govern the fate of a small bear population (see A.2.c).

A.2.c. Very Small Increases in Mortality Have Dramatic Consequence

On a related note, populations as small as that of the Yahk/Yaak transboundary area are acutely vulnerable to very small increases in mortality, especially of adult females. As per Point D in my comments, an increased loss of even 1 adult female bear every 2-5 years can dramatically escalate risks of population extirpation, a point that has been emphasized in research on viability of bear populations (Suchy et al. 1985, Sæther et al. 1998).

This foundational result highlights the extent to which fates of populations as small as that of the Yaak/Yahk region are governed by very small changes in mortality, much of which cannot be anticipated or even controlled by managers—a type of mortality that is often relegated to the category of chance events. Because of this, extinction risk for populations of around 100 mature individuals (i.e., not including adolescents or cubs) are driven by chance events more than by short-term (i.e., 10-year) population trajectory (O'Grady et al. 2004).

A.3. Implications for Management of Yaak Bears

Claims that the Yaak grizzly bear population increased by a few individuals—true or not—should not configure management. If true, an increase is certainly better than a decrease, but not cause to employ a minimalist—even deficient—suite of security standards and related management actions (see Points B.3 & C, below) for an acutely vulnerable bear population, as is being proposed under all Alternatives for the Black Ram project area. All of these Alternatives, including Alternative 2, are risk embracing rather than precautionary. The Black Ram project instead needs to promote more aggressive and far-seeing recovery efforts required to address risks engendered by small population size and low population densities, including ample habitat protections in the form of additional road closures (see Point C, below) and increased law enforcement (see Point B.3, below). Measures such as these are needed if the Yaak grizzly bear population is to be buffered from risks engendered by variability in lethality of humans and productivity of the natural environment.

B. There is No Evidence That Management of Federal Lands Caused Population Gains

None of the points raised in Section A of my objections address factors that likely caused putative changes in grizzly bear numbers during the last several decades, which is what I address here.

The Forest Service claims or strongly implies that management of its jurisdictions and, more specifically, management of roads and attractants on its lands has been a major cause of phantom increases in Yaak grizzly bear numbers (but see Point A.1, above), including on page 290 of the EA where road and attractant management are invoked as explicit reasons for presumed population increases, concluding that "This indicates that land management activities are conducive to and support recovery"; on page 306, where "Forest Service activities…have been successful at supporting recovery" is offered; and on page 120 of the Appendix G where "motorized access standards…have been so successful at reducing [sic]" risk of malicious killing is asserted.

B.1. Changes in Size of the Yaak Population Have Been Driven by Environmental Variability

As I elaborate in Point K.2 of my Comments, the weight of available evidence shows that most variation in size of the Yaak population between 1990 and 2015 was driven by variation in berry crops. This variation affected exposure of grizzly bears to people, with resulting effects on numbers of human-caused bear deaths. In others words, changes in human-caused grizzly bear mortality have likely been driven more by the vagaries of weather and climate than by systematic changes in factors under the control of the Forest Service.

This is not to say that on-the-ground changes in road access, law enforcement, and conflict prevention are unimportant, but rather that these efforts have so far been inadequate in the Yaak and on Forest Service jurisdictions, with the proposed Black Ram project being positioned to perpetuate an inadequate regime.

The Forest Service and US Fish & Wildlife Service altogether failed to address this issue and my related concerns in the DN, EA, and BiOp. This willful disregard for a factor of vital importance to judging the effects of management actions and environmental change is, at best, puzzling.

B.2. No Data or Valid Evidence Are Provided for Judging Effects on Grizzly Bear Mortality

On a related note, none of the Forest Service claims regarding benefits of its past management are substantiated by evidence. The Forest Service fails to provide data regarding why, in fact, grizzly bears die on its jurisdictions; nor does the Forest Service then use these data to appraise past or prospective benefits of management actions, including on the Black Ram project area. Likewise, the US Fish & Wildlife Service (USFWS) makes *pro forma* observations regarding the association of known human-caused mortalities with roads (specifically, 500-m zones of influence; e.g., pgs 29-30, BiOp), and then merely summarizes mortality in bar graph form for the totality of the Selkirk and Cabinet-Yaak Ecosystems, without differentiating mortality that occurred on private or federal lands (p30, BiOp). Nor do the USFWS or Forest Service offer any information on how estimated unreported bear mortalities—which adds considerably to the toll taken by malicious killing—inform the appraisal of benefits arising from management of roads and attractants on Forest Service lands.

B.2a. Claimed Benefits of Managing Attractants on Forest Service Lands Are Spurious

Interestingly, both the Forest and USFWS note that no grizzly bears have died because of conflicts over attractants on Forest Service lands in the Yaak and Cabinets, strongly implying that this was a result of effective Forest Service management of attractants (pg 42, BiOp; pg 306, EA). A tally of mortality going back to 1983 does indeed show that no grizzly died because of attractant-related conflicts on Forest Service lands during this entire period (from Kasworm et al. [2019, 2020]). However, this period includes 28 years that predate issuance of a forest-wide attractant storage order in 2011 (p.25, BiOp). The point here is that no change in bear mortalities on Forest Service lands correlates with changes in how attractants have been managed. Mortalities related to attractants have never been a major problem, which is not to say that this dynamic is not and has not been a major driver of grizzly bear mortality on other jurisdictions or in other ecosystems. Quite simply, management of attractants on Forest Service jurisdictions cannot be invoked as an explanation for any presumed improvement of population status for grizzly bears in the Yaak with, then, benefits offsetting impacts of the Black Ram project.

Parenthetically, both the Forest and USFWS claim that considerable benefits have accrued and will continue to accrue from better management of attractants on <u>private</u> lands (pg 88, BiOp; pgs 298 & 306, EA; see also Proctor et al. [2018]), largely attributable to efforts of a conflict management specialist paid through a cost-share arrangement with the Forest Service (pgs 30 & 88, BiOp). Whether this claimed benefit is true or not, the point here is that this applies only to conflicts and related grizzly bear mortalities on private lands, not Forest Service jurisdictions, and that greater benefits for grizzly bear recovery would likely arise from the Forest Service investing in additional conflict management specialists rather than additional management activities on remote lands in the Black Ram project area.

B.2.b. Claims Regarding Reduced Mortalities on Forest Lands Are Not Supported

The USFWS claims that numbers of known grizzly bear mortalities declined in the Cabinet-Yaak Ecosystem after 2009, which it then uses as further evidence for presumed improvements in status of the Cabinet and Yaak populations (pg 97, BiOp). The Forest Service claim of having made substantial contributions to this improvement further implies that there have been disproportionate improvements on its jurisdictions.

Neither of these explicit or implicit claims is supported by the available evidence. I elaborate on why in Points C & G of my earlier Comments, highlighting failures of the Forest Service and USFWS to account for: (1) estimated unreported mortalities; (2) substantial statistical uncertainties; (3) little or no change in averages between earlier and later comparison periods; and (4) an <u>increase</u> (not decrease) in the proportion of mortalities on Forest Service jurisdictions after 2008.

The Forest Service fails to meaningfully respond to these concerns raised in my earlier Comments and, instead, does little more than repeat “See the introduction to the grizzly bear section of this response to comments” (pgs 120 & 121, EA Appendix G), as if repetition of this mantra somehow addresses the very real issues I raised. In fact, the Introduction on pages 116 and 117 of Appendix G fails altogether to address these issues, at best offering the spurious claim that because Kasworm et al. (2018) used standard methods (e.g., for calculating proportions, ratios, and averages), this consilience somehow

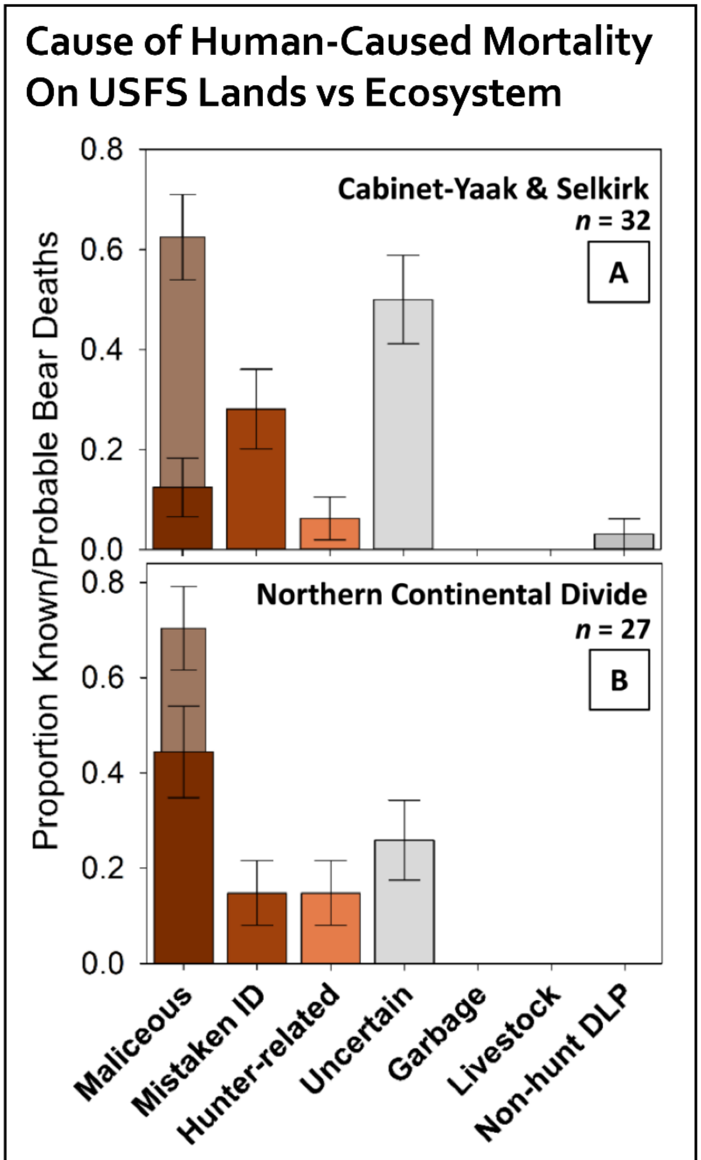

Figure 1. These bar charts show the proportional distribution of known and probable grizzly bear mortalities among causes, restricted to only those deaths documented on Forest Service jurisdictions. Panel (A) shows the break-down for the Cabinet-Yaak and Selkirk Ecosystems, combined. Panel (B) shows the break-down for the Flathead National Forest in the Northern Continental Divide Ecosystem. The dark burgundy bar labeled "Malicious" corresponds with deaths caused by verified poaching. The lighter brown bar behind includes the deaths denoted by the gray bar, most of which were likely attributable to illegal causes or circumstances.

remedies problems of bias, statistical uncertainty, and lack of support in available data (see also my Point A.1.a, above). It doesn't.

B.2.c. Illegal Killing and Mistaken ID Are Dominant Causes of Grizzly Bear Deaths on USFS Lands

A compilation of grizzly bear deaths and related causes on Forest Service jurisdictions was missing from the EA and BiOp—despite the critical importance of this information. To remedy this deficiency, I used data provided in government reports and databases from the Cabinet-Yaak, Selkirk, and Northern Continental Divide Ecosystems to produce such a compilation. My sources included Kasworm et al. (2018, 2019, 2020), Costello et al. (2016), and two excel databases obtained from Montana Fish, Wildlife, and Parks through requests under Montana's Public Records Act. I restricted my compilation of deaths in the NCDE to the Flathead National Forest because of similarity of conditions on this Forest to conditions in the Kootenai NF, in contrast to conditions on the Helena-Lewis & Clark NFs. The results of this compilation are in Figure 1.

Some grizzly bear deaths in this compilation are unambiguously listed as caused by poaching or malicious killers, but many are listed as "under investigation" or human-caused but for otherwise "undetermined" reasons. The USFWS makes clear that most of the deaths in these latter two categories were likely illegal, either because of proximal circumstances or failure of the involved people to report the bear deaths they caused (i.e., most deaths were caused by "bullet wounds" and/or radio-collars "had been cut off"; pg29, BiOp). Given that there is some degree of ambiguity about these distinctions, I show these deaths in Figure 1 differentiating the "under investigation" and human-caused but "undetermined" as a gray bar, and then combining these categories with documented malicious kills shown as a brown bar behind the burgundy bar denoting known poaching.

The basic point from this compilation is straight-forward. Malicious and other illegal killings are far and away the dominant cause of grizzly bear deaths on Forest Service lands, followed by black bear hunters mistakenly killing grizzlies (i.e., Mistaken ID). When an estimate of unreported mortalities is included, which disproportionately loads onto illegal kills, the outright dominance of this cause is even more unambiguous (I made both points in Point E of my earlier comments).

As the Forest Service and USFWS amply acknowledge, <u>known</u> human-caused mortality—without differentiating causes—is disproportionately concentrated near roads. Reasonably enough, both agencies conclude from this that access management is critical to limiting human-caused mortality. This point is not in dispute.

My main objections here—of relevance to the Black Ram project—are that the Forest Service and Fish & Wildlife Service: (1) employ access management standards that do not adequately address the nature and magnitude of human-caused mortality on Forest Service jurisdictions; and (2) fail to consider other actions that would be of more direct relevance to limiting grizzly bear deaths from malicious causes and mistaken IDs.

Parenthetically, the Forest Service responded to the first issue (1), as articulated in Points E and F of my Comments, by tritely observing "Risk reduction is why the motorized access management standards were developed, and have been so successful [sic] at reducing this risk" (pg 120, EA Appendix G). This response is essentially a non-response because it failed to address my concerns regarding adequacy of the referenced standards (see my Point C, below) and employed an unsubstantiated assertion about benefits arising from past access management, which is what I address in this section of my objections.

B.3. No Provisions Are Made for Adequate Prevention of Mortality on USFS Lands

Aside from managing road networks (for which standards are deficient, see Point C, below) and reducing availability of attractants (which is a moot issue on Forest Service lands), the only other measure offered by the Forest Service and USFWS for reducing grizzly bear mortalities is "outreach and education" (e.g., pgs 30, 79-81, 87-88, 92,97, 99-100, 119, BiOp; pgs, 290 & 306, EA). Although the USFWS offers highly qualified statements regarding the past efficacy of outreach and education (pgs 30 & 97, BiOp), the Forest Service takes a breath-taking leap beyond this more temperate stance by making unqualified claims about contributions of outreach and education to "extensive improvements" in population status and (pg 290, EA) the "current positive population trend" (pg 306, EA, but see Point 1.A, above).

Although the selective benefits of outreach and education are plausible and supported by anecdotal evidence, the USFWS and Forest Service mainly deploy an *ad nauseum* argument in support of this management tool; i.e., proof through repetition. But in addition to this evidentiary and argumentative weakness, there is little or no likelihood that outreach and education will, in fact, address the problem of illegal killing.

By definition, illegal and unreported killing of grizzly bears (e.g., poaching) is an illegal act which, also by definition, is often attributable to criminals. Without providing an extensive review, a large corpus of research on human social-psychology and criminology suggests that outreach and education will not deter criminal activity unless backed by the threat of coercion and/or a comprehensive social, economic, and political program (I can provide list of references if needed).

More specific to poaching, the available research shows or otherwise strongly suggests that this activity is motivated primarily by resentments, displacement of anxieties, ideology, worldviews, and community solidarity (e.g., Kaltenborn et al. 1998, Bjerke & Kaltenborn 1999, Johansson & Karlsson 2011, Johansson et al. 2012, Slagle et al. 2012, Zajac et al. 2012, Kaltenborn et al. 2013, Gangass et al. 2013, Lüchtrath & Schraml 2015, Kaltenborn & Brainerd et al. 2016, Højberg et al. 2017, Schroeder et al. 2018, Von Essen et al. 2018, Peterson et al. 2019). None of these motivations are likely to be changed by "education" (Clayton & Myers 2009, Koger & Du Nann Winter 2010; sorry, you'll have to buy your own copies of these insightful books).

The upshot of this is that the Forest Service needs to aggressively pursue both support for increased law enforcement and additional limitations on road access if the problem of illegal killing on Forest Service lands is to be addressed, including in the Black Ram project area. The Forest Service has already demonstrated that it is willing to support additional personnel employed by Montana's Department of Fish, Wildlife, & Parks through a cost-share arrangement (i.e., Kim Annis). Given the size of budgets being entertained for the Black Ram project, there should be ample funds to cost-share additional Fish, Wildlife, & Parks positions with a law enforcement focus. The Forest Service, moreover, has a Law Enforcement & Investigations branch that is fully empowered to enforce federal law and should be augmented in the project area to assist in deterring and apprehending individuals engaged in illegal activities.

The current DN and EA carry no provisions for meaningfully addressing the dominant reason why grizzly bears have died and will continue to die on the Kootenai National Forest and, prospectively, in the Black Ram project area. Current provisions rely on deficient security standards, measures that are moot, and measures with little likelihood of otherwise addressing the problem.

C. Security Standards Employed by the Kootenai National Forest Are Inadequate

The entire edifice of decisions made regarding prospective impacts of the Black Ram project on grizzly bears rests on the foundational notion that Wakkinen & Kasworm (1997) is the best available science, which is, in turn, presumably substantiated by evidence of phantom increases in the critically small Yaak grizzly bear population. As I elaborated in my earlier comments submitted during 2019 and in Point A.1 above, there is no credible basis for concluding that this small population has increased since 2012, the import of which is further mooted by the limited effect of short-term demographic changes on fates of populations <100 animals (as per my Point A.2, above). These well-substantiated points debar the invocation of "improvements" as basis for judging the efficacy of security standards. Furthermore, Wakkinen & Kasworm (1997) is not “the best available science.” I elaborate on this last point in what follows.

C.1. The Scientific Basis for Current Standards is Inadequate and Outdated

Wakkinen & Kasworm (1997) is the sole source for the trinity 26, 33, 55—≤26% of a BMU with total road densities >2 miles/mile^2; ≤33% of a BMU with open road densities >1 mile/mile^2; ≥55% of a BMU >500 m from the nearest road—that presumably guarantees the recovery of grizzly bears in the Cabinet-Yaak Ecosystem. This agency report is repeatedly invoked as “the best available science” by the USFWS (pgs 26, 54-56, 95, BiOp) as sanctification for the entire edifice of land management decisions on the Kootenai National Forest, including the Black Ram project area.

This invocation is based on several core assumptions: (1) no matter how dated, last in time is “best”; (2) any science done in other geographic areas, no matter how close and of what quality, is automatically of lesser merit; (3) the quality, relevance, and interpretation of area-specific, last-in-time research is exempt from critical evaluation; and (4) comparative assessments of research results are irrelevant.

Interestingly, according to these precepts, unreplicated research done in 1989 at the University of Utah should have been adopted by people living in Salt Lake City as a basis for on-going struggles to successfully build power plants utilizing cold fusion. My point here is that none of the tenets employed by the USFWS as a basis for claiming Wakkinen & Kasworm (1997) as “the best available science” is, in fact, a feature of good scientific practice or even prudent and precautionary management. The best that can be said for these precepts is that they appear to be expedient for social-political purposes.

C.1.a.* Prima facie*, Wakkinen & Kasworm (1997) Does Not Warrant Use as Best Available Science

Wakkinen & Kasworm (1997) is a 23-year-old agency publication reporting research results based on a sample size of 6 female bears (4 from the Selkirks and two from the Yaak) represented by 413 radio-telemetry locations obtained through use of VHF technology. If this research were submitted to a journal for publication today, it would be rejected out of hand during the first editorial screening, not only because the sample sizes are too small to support meaningful inferences, but also because the methods fall far short of current best practices and the interpretations far outstrip any support from the limited evidence that is presented.

But, in addition to being based on a small sample that imposes severe limits on scope of inference, Wakkinen & Kasworm (1997) compounded this problem by not controlling for the effects of habitat productivity and composition, a notion that was established as early as the late 1980s (e.g., Mattson et al. [1987]), and that has since become a fundamental requirement for robust inferences about avoidance of humans by bears (e.g., Nielsen et al. [2002, 2010] and Proctor et al. [2017]).

Even more problematic, Wakkinen & Kasworm (1997) only documented bear behavior in a landscape where their few study animals had limited opportunity to select truly remote secure habitat, which debarred any conclusions regarding what bears would select, even prefer, if they had access to larger areas free of human access. In other words, if a bear only has access to home-range-sized areas that are

50-60% secure, they can't exhibit selection for areas that are any more secure than that (see Proctor et al. [2017]). Given this constraint, claims by Wakkinen & Kasworm (1997), and the USFWS thereafter, that female grizzly bears in the Cabinet-Yaak and Selkirk Ecosystems only <u>need</u> areas that are 55% secure to adequately avoid humans is little more than circular reasoning (see C.3, below).

Finally, most problematic of all, the USFWS commits a classic *non sequitur* by arguing that, because the 6 grizzly bear females used in the Wakkinen & Kasworm analysis survived several years to produce locational data, *ipso facto*, the landscapes they occupied provide a template for habitat security standards that ensure recovery of grizzly bears in the Cabinet-Yaak Ecosystem.

This is yet another truly breath-taking and unsubstantiated leap of logic on the part of the USFWS and, as a derivative, the Kootenai National Forest. The chain of illogic is roughly: (1) because these 6 females were alive after producing locational data, this fact somehow provides a basis for inferences about survival rates (it doesn't); and (2) that *de facto* survival of these females for a couple of years somehow translates into a basis for reaching inferences about average survival rates of all females in this ecosystem, past, present, and future (it doesn't). This chain doesn't meet even minimal standards for cogent logic and, moreover, violates precepts for estimating vital rates that go back decades (e.g., Heisey & Fuller 1985, Krebs 1989).

C.1.b. The USFWS Neglects Its Trust Duties by Not Updating Relevant Analyses

The USFWS holds a monopoly on all data collected from grizzly bears in the Cabinet-Yaak Ecosystem, including permitting authority over access to these data by outside researchers. So far, the only researchers given direct access for independent analysis have been employed by the USFWS, directly affiliated with the USFWS (i.e., Michael Proctor), or employed by the states of Montana and Idaho. These monopolistic arrangements increase the burden on the USFWS to fulfill public trust responsibilities by updating analyses with substantial implications for land management decisions—as is the case with analyses relating to development of habitat security standards.

The USFWS has clearly failed in this particular trust responsibility. The last analysis of direct relevance to security standards was reported by Wakkinen & Kasworm (1997) 23 years ago, which the USFWS has subsequently invoked as "the best available science." This pattern of invocation seems to be one of convenience to political purposes, especially in light of the amount of data collected subsequent to Wakkinen & Kasworm (1997), and patterns suggested by the summary data available in annual reports.

More specifically, a total of 49 years of locational data have been collected from research-trapped adult female grizzly bears in the Cabinet-Yaak Ecosystem, post 1996, which is 1.8-times more years than were covered by data collected prior to 1997 (28 years; Kasworm et al. [2018]: Table 17). In other words, the amount of data relevant to judging behavioral responses of grizzly bears to human features (as reckoned in terms of total monitoring time) has nearly tripled. As important, summaries of estimated home range sizes provided in annual progress reports (e.g., Kasworm et al. [2018]: Table 18) suggest that average sizes have declined since 1996, even after accounting for the effects of temporal duration on estimations (c. 940 km^2 versus 870 km^2 for earlier and later periods, respectively; see Figure 2). This diminishment alone has potentially noteworthy implications given that small size could correlate with

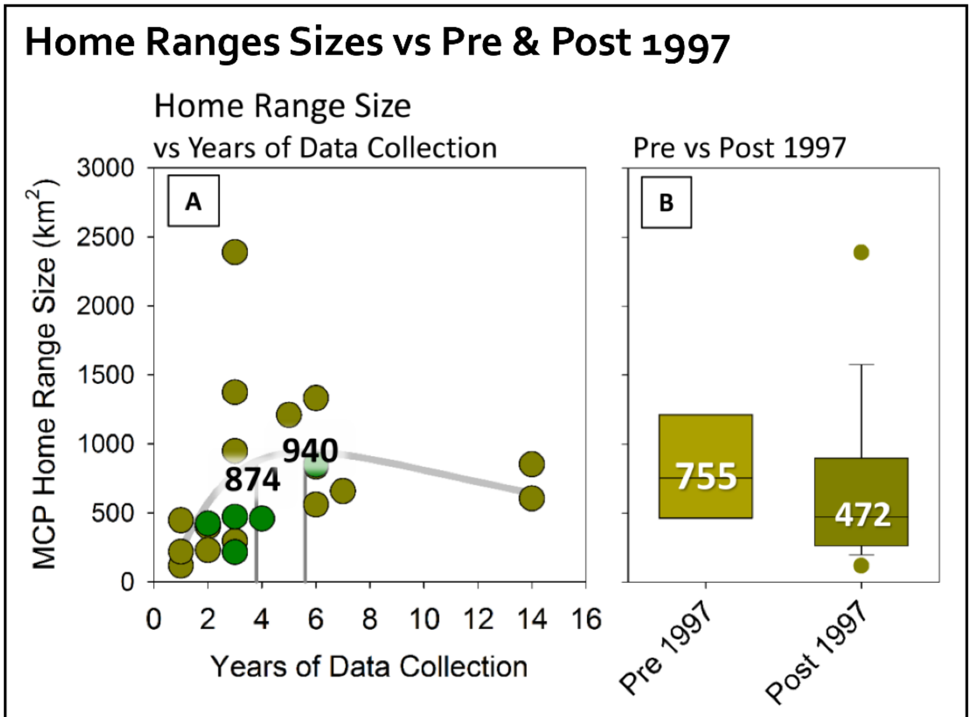

Figure 2. This figure provides information on home range sizes for research-trapped female grizzly bears in the Cabinet-Yaak and Selirk Ecosystems, featuring a contrast between pre-1997 and post-1997 (data from Kasworm et al. [2018, 2019]). Panel (A) shows the relation between home range size and the number of years that the focal bear was monitored. This matters because home range size tends to vary with duration of monitoring, as evidenced by a positive relationship up to around 5-years. The vertical gray lines correspond with the mean time monitored for grizzly bears pre-1997 (5.8 years = 940 km^2) versus post-1997 (3.9 years = 874 km^2). These estimated home range sizes correct for the bias introduced by duration of monitoring. Panel (B) shows box plots for the raw data pre- and post-1997, with the numbers 755 and 472 corresponding with median home range sizes (in km^2) for each period).

greater concentration of radiolocations in available core secure habitat, with implications for security standards.

The USFWS needs to remedy this situation by updating the analysis of grizzly bear habitat selection in the Cabinet-Yaak Ecosystem using best available scientific methods, accompanied by prudent and defensible conclusions, as per the direction evidenced by Proctor & Kasworm (2020).

C.1.c. Research Shows That Habitat Security Was Inadequate During the Baseline Period of 1983-1996

Importantly, noteworthy research exists that directly contradicts assertions made by the USFWS that configurations of habitat used by animals included in the Wakkinen & Kasworm (1997) analysis are sufficient to ensure long-term population stability and growth. Of most relevance, Wakkinen & Kasworm (2004) reported estimated vital rates for the Cabinet-Yaak grizzly bear population using data collected during 1983-2002—a period that overlapped 70% with years during which locational data were collected for use in the 1997 report. Cumulative population growth rates for this period are also routinely shown in annual progress reports, most recently in Kasworm et al. (2020).

One would expect that, if habitat used by a handful of females bears during 1983-1996 was emblematic of conditions needed to promote recovery, this would be evidenced in a stable if not positive population trajectory. It was not. Wakkinen & Kasworm (2004) estimate a potentially catastrophic negative trajectory of roughly -4% per annum during the concurrent period, 1983-2002. This result has been consistently confirmed for this period in subsequent annual research reports for the Cabinet-Yaak Ecosystem (e.g., Kasworm et al. [2020]).

In other words, the most defensible conclusion in light of available evidence is that configurations of habitat vis-à-vis human access features during 1983-1996 were not in fact adequate to promote growth of the grizzly bear population. Regardless of total configurations of human access on the Kootenai National Forest at the time of the 1983-1996 study, the females that survived to produce the data used by Wakkinen & Kasworm (1997) were not only using configurations of habitat that were used, in turn, as a template for security standards, but were also foundational to estimates of population growth during 1983-2002.

Parenthetically, this begs the question of why status of the Yaak grizzly bear population seemed to improve between 2006 and 2012 (Kasworm et al. 2018:37). As I point out in B.1 and B2.a, above, recovery of the population during this period was likely driven primarily by beneficial environmental change (i.e., increased fruit crops), with improvements in management of attractants and conflicts on private lands plausibly contributing to sustaining the Yaak bear population since then.

In summary, the most defensible conclusion in light of available evidence is that configurations of habitat used to develop the presumed 23, 33, 55 trifecta are not sufficient to sustain growth of the Cabinet-Yaak Ecosystem, especially in the face of on-going and foreseeable environmental variability. More certainly, invocations of this trifecta as a proven formula for ensuring contributions of Forest Service land management to recovery of Yaak grizzly bears is not defensible, much less precautionary.

But there is more that lends weight to this conclusion.

C.2. Core Security Areas are Too Small

C.2.a. USFWS Ignores the Best Available Science on Core Area Size

As I suggested in my earlier Comment H, the best available science unambiguously shows that core areas >500 m from roads need to be of a minimum size if bears are to be able to meet daily foraging requirements without incurring unsustainable risks of human-caused mortality arising from using areas near (within 500-m of) human facilities.

This basic notion was first articulated by Mattson (1993; cited by the USFWS, pg 51, BiOp) as a basis for defining what he called "micro-scale security areas." Using data from the Greater Yellowstone Ecosystem, he calculated that these security areas needed to be roughly 7,000 acres in size. Gibeau et al.

(2001) deployed this concept to appraise habitat security in and near Banff National Banff, estimating that, based on data from this ecosystem, security areas needed to be roughly 2,200 acres in size. Proctor et al. (2015) subsequently employed this parameter to define core security areas for the Cabinet-Yaak and Yahk Ecosystems. More recently, Proctor et al. (2017) estimated that secure areas needed to be roughly 12,400 acres in size at the scale of home ranges (50-km^2) and 4,700 acres at the scale of seasonal movements (19-km^2). Interestingly, Wakkinen & Kasworm (1997) also recommended that security areas ("patches") be of a minimum size, somewhere between 1,280 and 5,120 acres. The average and median of these minimum sizes produces an estimate of 4,100-4,700 acres for daily or seasonal security areas (i.e., secure "patches" or "blocks").

Despite this corpus of research, the USFWS in its BiOp (pg 56) and thence the Forest Service in its Land Management Plan (FW-STD-WL-02) and the Black Ram EA (pgs 292-293) argue that percent secure habitat can be defined "regardless of patch [block] size." The USFWS presumes to justify this prescriptive statement by claiming that Wakkinen & Kasworm (1997) "…did not identify a minimum patch size at which grizzly bears failed to use the secure habitat," when in fact they did recommend that patches be of a substantial (1,280-5,120 acre) size. The USFWS compounds its disingenuousness by further noting that "…in the Yaak, 89% [of radiolocations] were in patches" >2,560 acres in size, but then concludes "…because no minimum size polygon that grizzly bears would utilize could be detected, the…LMP [Land Management Plan] for the KNF [Kootenai National Forest] does not include a minimum block size for core habitat."

The disingenuousness of these assertions and related conclusions is, again, breath-taking. If nothing else, the USFWS is either implying, if not stating outright, that the only basis for judging inadequacy of core secure areas is a total absence of observed grizzly bear use. Nowhere have I ever encountered use of such a standard for judging the impacts of human-related features on grizzly bear habitat use. In every instance where researchers and managers have previously judged avoidance or under-use, and thus magnitude of human impacts (including in the many publications given *pro forma* consideration by the USFWS; pgs 47-51) the standard has been whether some reckoning of use is proportionately less than what might be expected by some reckoning of availability. An adequately secure area is thus identified on the basis of parameters associated with levels of use greater than expected. Likewise, a human-impacted area is identified on the basis of parameters associated with use less than expected—not by a total absence of use.

Applying this notion, Proctor et al. (2015) show that only 17% of the entire Black Ram project area is in secure core areas greater than roughly 2,200 acres in size, which increases to 20% if dispersal habitat is included.

Assuming that much of the data collected from grizzly bears in the Yaak comes from this area (see Kasworm et al. [2020]; Appendix 4) and is thus the basis for the USFWS calculation that 89% of radiolocations were in areas >2,560 acres in size, this handily translates into a disproportionality: Core secure areas >2,560 acres are used by bears >5-times as intensively as expected by chance; remaining areas are used roughly ⅕ as much as expected by chance. This is an unambiguous disproportionality of a magnitude only rarely evident in distributions of bears relative to human features (see the many references given *pro forma* review by the USFWS, pgs 47-51, BiOp), and ample grounds for establishing a standard requiring that core "blocks" be at least 2,500 acres—but more defensibly 4,000-5,000 acres—in size (but see C.3, below).

The USFWS has thus violated basic precepts and norms of science and management in asserting that there is no basis for defining a minimum size for secure "patches" or "blocks" and that none is thus warranted. The USFWS needs to remedy this deficiency by establishing a minimum size for core secure areas/patches/blocks, most defensibly in the range of 4,000 to 5,000 acres.

C.2.b. Implications of a Minimum Core/Block Size for Judging Habitat Security

The implications of establishing a minimum size for core security areas or blocks are substantial, even taking at face value the deficient standard of 55% secure habitat (see C.3, below) adopted by the Kootenai National Forest for judging impacts of the proposed Black Ram project.

The Forest Service has aided assessment of these implications by helpfully providing a list of "secure blocks" along with blocks sizes in Tables 85 and 86 on pages 292-293 of the EA. A summation of these so-called secure blocks leads the Forest Service to conclude that BMU 14 is 56% secure and BMU 15 55% secure, and thus that both meet standards. If one trims these blocks to delete those that are below any defensible size threshold, neither BMU meets standards. If a 2,000-acre threshold is applied, BMU 14 is 54% secure and BMU 15 52% secure. If a more defensible 4,000-acre threshold is applied, BMU 14 is 51% secure and BMU 15 again 52% secure. Both are thus 6-7% below standard.

This conclusion is predicated on adequacy of the 55% standard for secure habitat enshrined by the USFWS and Kootenai National Forest. However, this standard is not justified by either the best available science or cogent comparison with standards employed and met in other grizzly bear ecosystems.

C.3. The Percent Core Security Standard for Kootenai NF BMUs is Inadequate

As I note in Point F of my earlier Comments, Forest Service standards for establishing percentages of secure habitat (>500 m from human facilities) on a BMU-basis are deficient and not supported by the best available science. Rather than the current 55%, as applied to the Black Ram project area, the standard should be closer to 75-80%.

C.3.a. Comparatively Lax Security Standards in the Cabinet-Yaak Ecosystem are Indefensible

I observed in Point F of my Comments that security standards employed by the Kootenai NF and endorsed by USFWS are much laxer than those employed in other grizzly bear ecosystems. The Forest Service failed altogether to respond to this critically important point.

This greater laxness of security standards in the Cabinet-Yaak Ecosystem is *prima facie* illogical and not precautionary. The two grizzly bear populations occupying this ecosystem—in the Yaak and in the Cabinet Mountains—are each <u>30- to 40-times smaller</u> than grizzly bear populations in the Northern Continental Divide (NCDE) and Greater Yellowstone (GYE) Ecosystems. The Cabinet-Yaak populations are indisputably acutely vulnerable to extirpation (>50-90% chance) within the next 100 years (Point A.2.b,

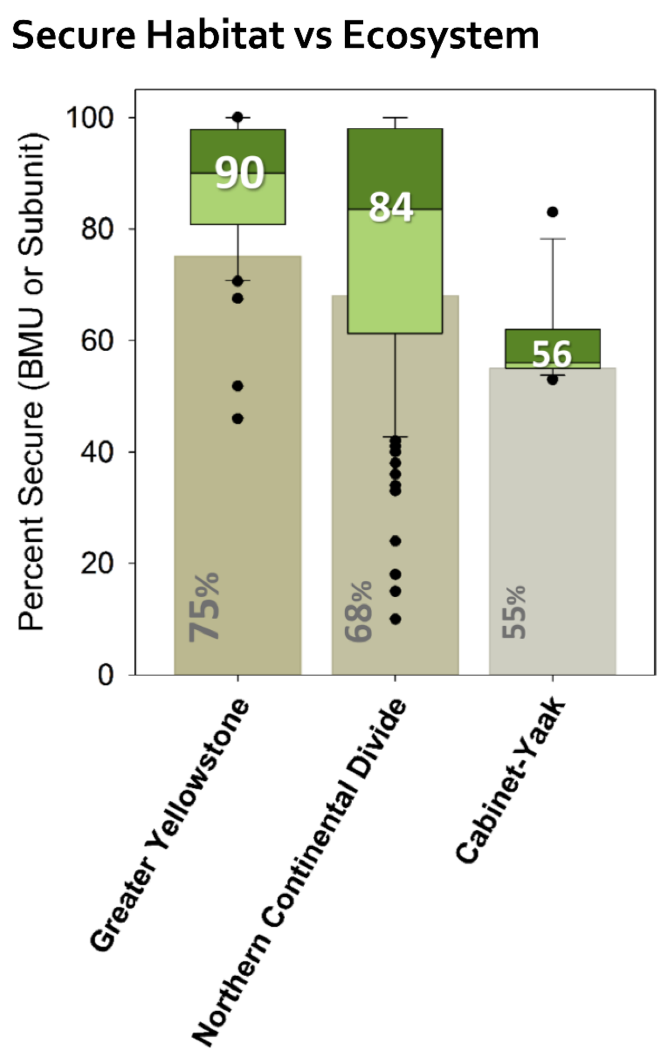

Figure 3. This chart combines bars (in shades of light dusky green) and box plots (in shades of darker green) to depict differences in security standards (secure % by Bear Management Unit [BMU]) and realized percent security by Grizzly Bear Recovery Area. The bars denote standards, with the percent standards also shown. The box plots show realized security on a BMU or BMU-Subunit basis. The numbers of each box plot are median percent security for each Ecosystem.

above), unlike the larger populations in the NCDE and GYE. Growth of the Cabinet and Yaak populations is also highly uncertain and, at best, amounting to only a handful of individuals (Point A, above), with gains most likely driven by recent favorable environmental conditions and modest improvements in management on private lands (Point B.2, above). These facts alone would suggest that security standards should be more stringent, not less, in the Cabinet-Yaak Ecosystem.

Figure 3 puts the comparative laxness of habitat security in the Cabinet-Yaak Ecosystem in visual form. In this figure I summarize percent secure habitat in BMUs and BMU-Subunits as box plots for the GYE, NCDE, and Cabinet-Yaak Ecosystems (data from Van Manen et al. [2019]:115-116; NCDE Conservation Strategy, Appendix 3:27-29; Kootenai NF Plan Monitoring & Evaluation Report [2013]:16-17). I also show the standard for percent BMU habitat security for each ecosystem as a lighter-shaded bar (75% for the GYE, 68% for the NCDE, and 55% for the Cabinet-Yaak). Median habitat security across all BMUs is 90% in the GYE, 84% in the NCDE, and only 56% in the Cabinet-Yaak.

Given the comparatively small sizes and acute vulnerabilities of the Yaak and Cabinet grizzly bear populations, deployment of a security standard that is 20-25% less than in other ecosystems, realized on-the-ground in security that is 34-38% less, is not only nonsensical, but also scientifically and biologically indefensible (see also my Points A-B, above, addressing faults in both the referencing of and the selectively referenced science).

C.3.b. Standards for BMU-Level Security Are Not Scientifically Defensible

A number of researchers have emphasized, post-1997, the importance of extensive areas of productive habitat remote from humans for conservation of grizzly bears populations. Such areas buffer populations from the vagaries of environmental variation, increase the extent of source populations, and sustain longer-term positive growth rates. Some of the most definitive studies supporting these conclusions come from areas near and even adjacent to the Yaak region, including McLellan (2015), Proctor et al. (2017), Lamb et al. (2018), and Lamb et al. (2020).

Notably, the remote productive areas invoked by these researchers as key to robustness of grizzly bear populations are >4,500 acres in size. Of even greater relevance to Kootenai NF security standards and judgements regarding impacts of the Black Ram project, Proctor et al. (2017:37) noted that "…females across our study area had home ranges that contained 78% of habitat >500m from an open road, when the available proportion was 56%." This is a critically important observation given that there is no evidence that Wakkinen & Kasworm (1997) monitored female bears with access to home-range-sized areas encompassing >55% secure habitat. In other words, if a bear does not have access to extensive tracts of secure productive habitat, *de facto*, it cannot select for such tracts. Selection manifest by the handful of bears monitored by Wakkinen & Kasworm (1997) is almost certainly an artifact of limited options rather than a reflection of preference or optimal conditions; nor, as I elaborate in A.1, B, and C1, is there any basis for confidently concluding that 55% habitat security on Forest Service lands is, in fact, sufficient to sustain long-term population growth.

Results from Proctor et al. (2015) and Mattson & Merrill (2004) are also directly relevant to judging adequacy of habitat security for grizzly bears in the Black Ram project area (see Figure 5, below). These results provide important complementary information given that Proctor et al. (2015) modeled core security areas at a finer grain on the basis of grizzly bear habitat selection and movements, whereas Mattson & Merrill (2004) modeled population source areas on the basis of coarser-grain distributions of habitat productivity and grizzly bear mortalities. However, both found that areas of secure productive habitat were far less prevalent in BMUs 14 and 15 than the 55-56% claimed by the Forest Service in the Black Ram EA. Proctor et al. (2015) show that approximately 17% of the project area qualifies as secure core, although an additional 3% qualifies as dispersal habitat—for a total of 20%. Mattson & Merrill (2004) show that only 38% of the project area has a high probability of functioning as source habitat. By either reckoning, these results based on direct evidence—as opposed to unwarranted inferences from faulty science—show that functional security in the Black Ram project area is roughly 30-60% less than that claimed by the Forest Service.

All of this is relevant to judging the merits of a purported appraisal by the USFWS of habitat security standards for the Cabinet-Yaak Ecosystem reported on page 95 of the BiOp. More specifically, without offering any details about their analysis, the USFWS states: "We found no evidence from 2011-2019 to suggest mortalities are more abundant [sic] in BMUs that do not meet standards" and "We found no correlation to suggest that occupancy of a BMU by females with cubs is directly tied [?] to a BMU meeting access management standards or benchmarks." These statements and the related conclusion that habitat security standards are *ipso facto* adequate is an example of arguing from a false premise—

the premise that any of the Cabinet-Yaak BMUs are adequately secure. Moreover, the range of variation in levels of security among BMUs is so small that it precludes any statistically significant correlation (see Figure 3; I can provide references to substantiate this very basic statistical point if needed).

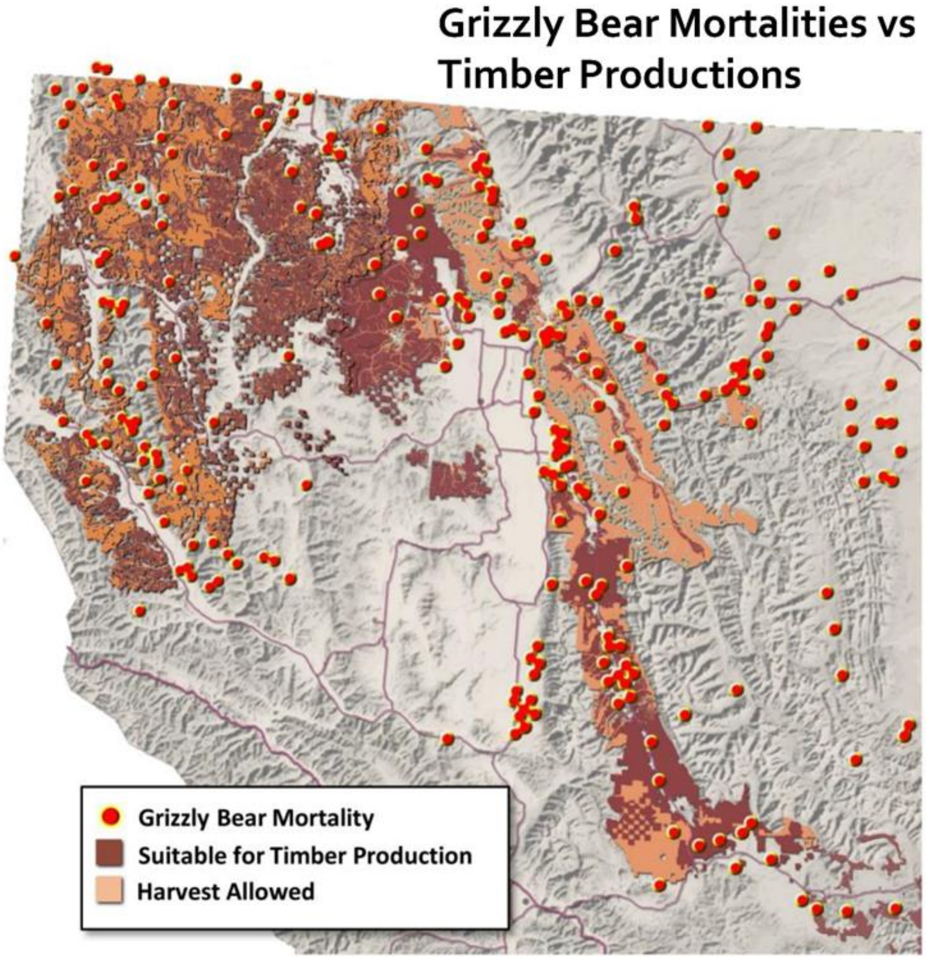

Figure 4. This map shows locations of know-probable grizzly bear mortalities for the Cabinet-Yaak and Northern Continental Divide Ecosystems (red dots) overlain as areas designated as either suitable for timber production (burgundy) or suitable for harvest in service of other objectives (tan; maps of each were obtained from the Kootenai NF and Flathead NF Land Management Plans). Private property and other land management designations are not shown). The only other concentrations of mortality not on or near lands designated by the USFS for timber production, other harvest, and supporting road infrastructure are on the Flathead and Blackfeet Indian Reservation and agricultural lands to the east of the Rocky Mountain Front.

All of the evidence I've provided in Points A.1, B, and C provides robust support for concluding that essentially all of Cabinet-Yaak BMUs are insufficiently secure. In other words, a spectrum of security conditions doesn't exist in the Cabinet-Yaak Ecosystem (i.e., see Figure 3) that support any meaningful conclusions regarding whether bears are faring better in one area versus another as a function of meaningful variation in habitat security.

As visual evidence of this basic point, Figure 4 shows the distribution of known and probable grizzly bear mortalities on the Kootenai, Flathead, and Helena National Forests relative to the distribution of lands in these forests actively managed as part of the timber base (burgundy) or as areas where some sort of harvest or treatment is allowed (orange)—both of which correlate with the extent of open and closed road systems. There are two main points from this graphic: first, that the Cabinet-Yaak Ecosystem lacks large roadless areas managed for primitive characteristics comparable in size to those of the Northern Continental Divide Ecosystem (as per Point F in my earlier Comments); second, that grizzly bear mortalities are highly positively correlated geospatially with these roaded areas (regardless of gated or stored status); and, third, that grizzly bear mortalities are, in fact, rare in large roadless areas >100,000 acres in size.

D. Summary Conclusions and Objections for Sections A-C

The main points of Sections A-C are: (1) Kootenai NF habitat security standards are inadequate; (2) claims made by the USFWS in it BiOp regarding adequacy of these standards are not substantiated by the best available science or by credible logic; and (3) the Black Ram EA does not provide a meaningful or substantiated assessment of grizzly bear habitat security and prospective project impacts on grizzly bear survival and habitat alienation.

E. The USFWS and Forest Service Apply Vagarious, Minimalist, Unjustifiable Standards

The entire edifice of decisions regarding effects of the Black Ram project on grizzly bears rests on a house of cards: science standards that are not supported by logic or the best available science (Point C, above); substantiated by phantom increases in numbers of bears (Point A.1, above); making unwarranted invocations of changes in management on Kootenai NF lands as partial cause for these phantom increases (Point B, above); and all, despite acute vulnerability of the Yaak and Cabinets grizzly bear populations (Point A.2, above), in defiance of prudence and the precautionary principle.

But the USFS and Forest Service exacerbate this already problematic situation by liberally obfuscating decision-making processes in the BiOp—and thence the Kootenai Land Management Plan (LMP) and Black Ram EA—with vagarious invocations of ill-defined and unjustified standards.

E.1. The USFWS Employs Unjustifiable Standards to Judge LMP Security Standards

The USFWS presumes to appraise adequacy of the LMP security standards by asserting, in reference to adult female grizzly bears, that impacts or efficacies can judged by "an individual " (pg 54, BiOp), "some individual…bears" (pg 57, BiOp), "some bears" (pg 54, BiOp), "only a few" (pg108, BiOp), "not…all" (pg 61, BiOp), "individual bears" (pg 62, BiOp), "individual grizzly bears" (pg 63, BiOp), "a few bears" (pg 86, BiOp), "a low [sic] number" (pg 108, BiOp), "not…all" (pg 108, BiOp), and "low numbers" (pg 109, BiOp).

The USFWS also makes statements asserting that LMP security standards will "support continued grizzly bear use", "support occupancy", "support…connectivity", "allow for reproduction" (all on pg 100, BiOp), "support grizzly bear occupancy", and "favor occupancy and reproduction" (both on pg 101, BiOp); followed by the interesting conclusion that "not all actions…will result in adverse effects" (pg 102, BiOp).

The USFS seems to be claiming that if not all grizzlies bears are harmed by an action, or if a few, some, or one manages to remain unharmed, this verdict is relevant to judging whether land management practices can prudently be expected to sustain meaningful recovery of a small imperiled and semi-isolated grizzly bear population that is half the size deemed necessary for recovery and acutely vulnerable to the vagaries of natural variation in climate and fire regimes.

This claim cannot be substantiated by any widely-accepted standard or principle. The fates of at-risk populations are governed by statistical averages reckoned over long periods of time, with demonstrable relevance to future projections (unlike what the Black Ram EA invokes, as per Point A, above). Although these averages are built on the fates of individual animals, the fate of one (or a few bears) provides essentially no basis for judging whether landscape-level management practices are adequate, much less precautionary.

On a similar note, it is altogether unclear what, precisely, supporting, favoring, or allowing means when it comes to judging the adequacy of landscape-level management practices. If one female grizzly bear survives for a month?...a year?...two years?, or is observed to reproduce within such periods of time, is this tantamount to supporting, favoring, or allowing? In other words, these terms are essentially meaningless, yet the USFWS employs them to reach the weightiest conclusions of the entire BiOp.

The USFWS concludes this litany of obfuscations with a faith-based statement; i.e.: "The Service believes that the KNF's LMP [Kootenai NF Land Management Plan] reduces the potential for and minimizes the effect of incidental take of grizzly bears." Belief is not an adequate basis for evidence-based rational judgements regarding the adequacy of the LMP and, as a derivative, the Black Ram EA.

E.2. The USFWS & Forest Service Employ Circular Reasoning When Judging Harm

The population of grizzly bears in the Yaak area totals roughly 30 animals, existing at one of the lowest densities on the continent, and at roughly half the density required to meet the USFWS's minimal recovery standards. From this, the Forest Service estimates that roughly 6 bears occupy the Black Ram project area, including the two BMUs overlapped by the project area (see Point C, above).

The USFWS and Forest Service use these basic facts to reach some ill-founded if not illogical conclusions. The illogic goes something like this: if there are very few bears in the Yaak population or Black Ram project area, then, *ipso facto*, only a few bears at most are likely to be harmed by human activities allowed under the LMP (pgs 108 & 109, BiOp), and thus these activities are not likely to jeopardize the bear population. As a derivative, the USFWS and Forest Service surmise that, because grizzly bears exist at such low densities, there is surplus secure habitat that any given bear can use to offset any alienation caused by additional human activities (pg 109, BiOp; pgs 299 & 303, EA).

The first conclusion is fallacious for the simple reason that, with a population of only a few bears, harm to even one bear is of proportionally greater consequence to population persistence compared to if the population numbered in the hundreds. There are no surplus or irrelevant bears; and harm to even one has serious population-level ramifications.

The second derivative conclusion is not particularly logical or supported by judicious consideration of the best available information. If a surfeit of secure productive habitat existed then one would expect the female bears studied by Wakkinen & Kasworm (1997) to have avoided areas near people and roads altogether, and that there would be ample evidence of the same from more recent data, yet this isn't the case. Moreover, this conclusion rests in part on the unstated assumption that black bears don't exist and/or don't matter in configuring—even limiting—availability of food and security resources. In fact, the comparatively high density of black bears in the Yaak area likely does affect resource use and habitat selection by grizzly bears in detrimental ways (Mattson et al. 2005, Stetz et al. 2019).

F. The Forest Service Prioritization of Mechanical Treatments is Unjustified

The Forest Service states on page 304 of the Black Ram EA that: "A primary purpose and need of the project is to move vegetative characteristics towards desired conditions which in turn improve habitat conditions favorable to the grizzly bear in treated areas [sic]." If a primary purpose of the project is, indeed, to improve habitat conditions for grizzly bears, then the best available tools would logically be candidate for inclusion.

F.1. Grizzly Bears Select for Habitats Produced by Natural Disturbances and Environmental Conditions

One proxy for identifying the best management tools is the types of landscape conditions favored by grizzly bears, and whether any given tool is more or less likely to produce those conditions. A comprehensive review of the relevant research addressing grizzly bear habitat selection in ecosystems inclusive of or similar to that of the Yaak (Zager 1980; Waller 1992; Mace et al. 1996, 1999; Waller & Mace 1997; McLellan & Hovey 2001; Wielgus & Vernier 2003; Apps et al. 2004, 2016; Nielson 2011; Proctor et al. 2015; Proctor & Kasworm 2020) shows that some of the most consistent and strongest positive selection by grizzly bears is for habitat features within which managers have little or no control over productivity: **avalanche chutes** and **riparian areas**—both of which tend to support abundant *Heracleum*, *Angelica*, *Osmorhiza*, and *Equisetum*, all of which thrive in shade or semi-shade (Scaggs 1979, Mace 1984).

Given the well-documented avoidance of roads and human activity by grizzly bears (see pg 53, BiOp) and the presumed priority given habitat improvement in the Black Ram, perhaps the single best action that could be taken to achieve this goal is closure and/or storage of all roads within 500 m of an avalanche chute or riparian area. Even so, I could find no indication that this probable single best improvement of habitat conditions—i.e., facilitating free access by bears to highly-preferred habitat components—was even considered by the Forest Service in its EA.

Insofar as successional habitats are concerned, there is no ambiguity about the consistently strong positive selection by grizzly bears for **shrublands** and **timbered-shrublands** roughly 40-50 years or even longer post fire (see also Martinka [1976], McLellan [2015], Proctor et al. [2017]). McLellan (2015) also observed that large burns of productive uplands are highly beneficial to grizzly bears, consistent with the long history of intensive exploitation of huckleberries by grizzly bears in the Apgar Mountains of Glacier National Park (Shaffer 1971, Martinka 1976).

By contrast, observed selection of cutting units is vagarious, and more often strongly negative than even modestly positive. This result holds even when controlling for the effects of roads (e.g., Waller & Mace 1996, McLellan & Hovey 2001, Apps et al. 2016, Proctor & Kasworm 2020), and is consistent with the results of Proctor et al. (2017) regarding distribution of productive huckleberry patches in adjacent areas of British Columbia: ""We found 74% of huckleberry patches were not in cut blocks. The ~26% of huckleberry patches that were in cut blocks occurred where the proportion of our focal area in cut blocks was only 18%."

Parenthetically, despite Forest Service claims that habitat use in the Yaak area is "well-documented" (pg 296, EA; citing Kasworm et al. [2007] reiterated by Johnson & Gatreaux [2008]), the better reference is Proctor & Kasworm (2020). Habitat use reported in Kasworm et al. (2007) is based on a small sample size, spanning only a few years, and without being adjusted to account for availability of different types. There is no information to be found in Kasworm et al. (2007) about habitat selection and how use varies with environmental conditions. It has long been recognized that estimates of selection (i.e., use versus availability)—not rote use—are required for judging the effects of changed habitat configurations resulting from natural or anthropogenic causes.

The upshot of all this is that management activities proposed under Alternative 2 of the Black Ram project have little prospect of improving habitat conditions and related access by bears to intrinsically productive areas, especially in contrast to allowing natural disturbances such as wildfire to play a greater role.

F.2. The Forest Service Disregards the Best Option for Improving Habitat Conditions for Grizzly Bears

F.2.a. Forest Service Claims Regarding Benefits of Alternative 2 Treatments Are Implausible

The Forest Service invokes Management Direction MA6-DC-VEG-01 as a principle directive to use timber harvest and prescribed human-ignited fires as the sole means of achieving its <u>primary</u> purpose of improving or maintaining habitat conditions for grizzly bears in the Black Ram project area—albeit giving a nod to the fact that natural processes will continue to occur. The Forest Service further justifies reliance on anthropogenic tools together with active suppression of natural fires by claiming that these measures will protect resources such as roads and campgrounds as well as "urban" areas potentially threatened by natural ignitions in the project area.

On the face of it, these claims are not very plausible. It is hard to imagine that wildfires would severely damage physical road prisms or any features in campgrounds other than picnic tables and outhouses. The Forest Service has also amply demonstrated that it can and will deal with hazard trees in the aftermath of fire. Insofar as the urban-wildland zone or interface is concerned, most of the Black Ram project area is far removed from this designated zone, as are many of the harvest treatments proposed under Alternative 2 (see Figure 5).

There is, moreover, a tacit assumption in the Forest Service's argument that: (1) the agency will be able to control wildfires burning under extreme weather conditions (i.e., the recipe for almost all large fires);

Black Ram Impacts vs Secure Habitat

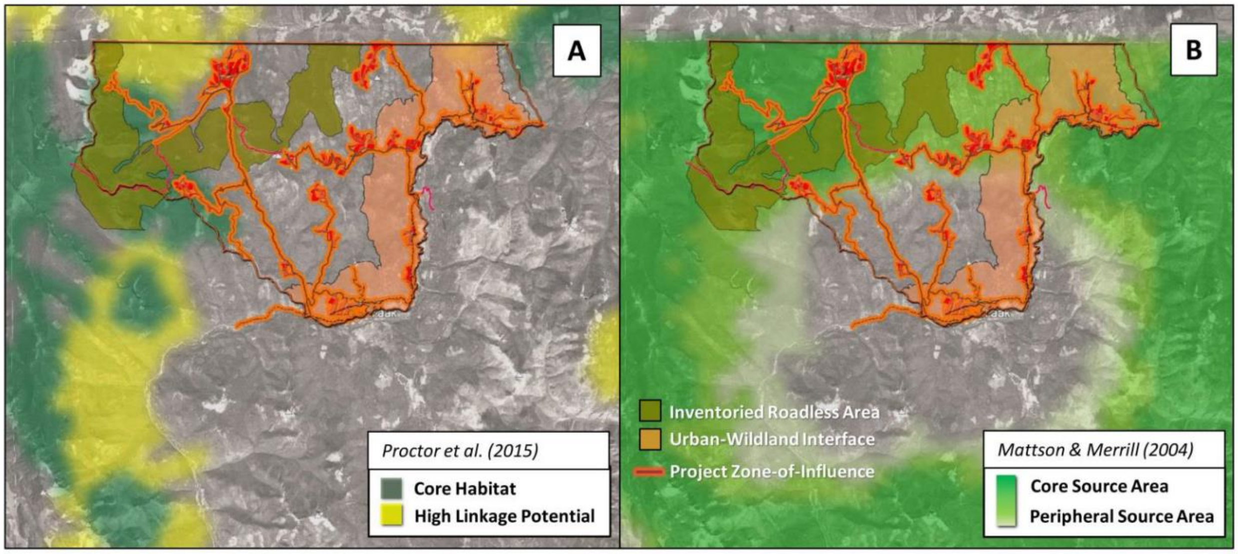

Figure 5. These maps show the Black Ram Project Area (delineated by a dark red line); road systems and proposed harvest units along with zones of impact (red lines or polygons with orange buffers); inventoried roadless areas (in dusky green); and the designated Wildland-Urban Interface (light orange)—all relative to two depictions of grizzly bear habitat security and productivity. Panel (A) shows core habitat (dark green) and areas with high dispersal potential (yellow) modeled on the basis of finer-scale grizzly bear habitat selection and movements by Protor et al. (2015). Panel (B) shows probabilities of an area functioning as a population source (versus sink) at the scale of grizzly bear home ranges modeled by Mattson & Merrill (2004). In the latter, darker green denotes a higher probability source area, lighter green a lower-probability source area.

Black Ram Impacts vs High-Use Habitat

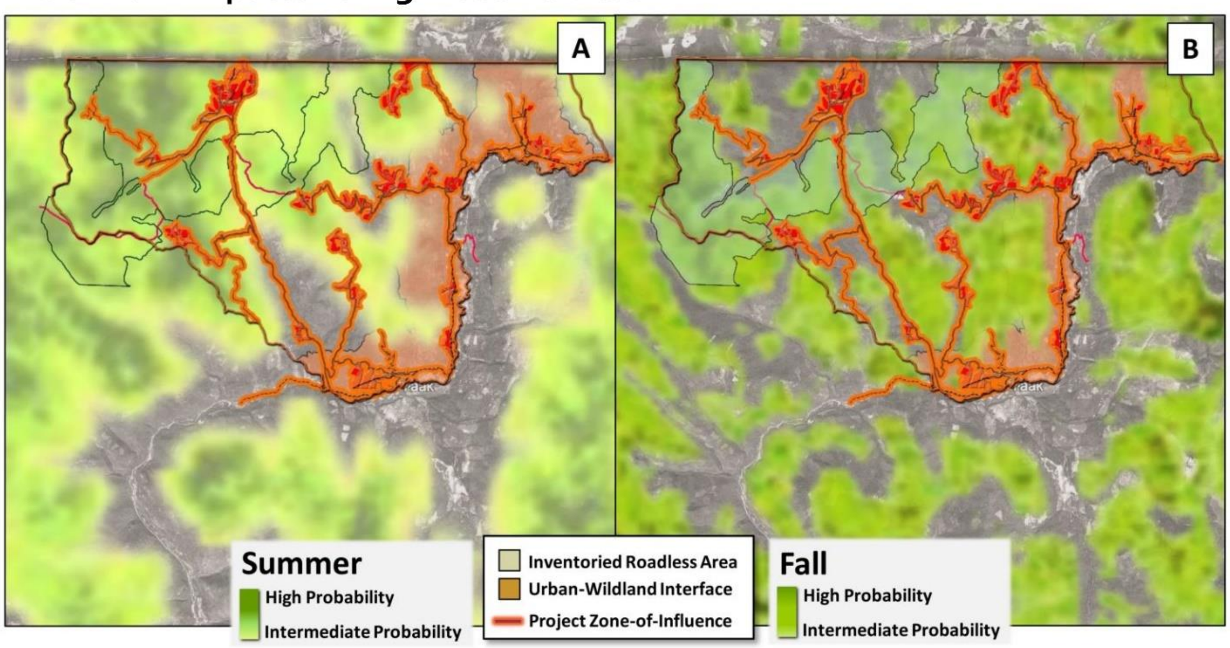

Figure 6. These maps show the Black Ram Project Area (delineated by a dark red line); road systems and proposed harvest units along with zones of impact (red lines or polygons with orange buffers); inventoried roadless areas (delineated by a black line); and the designated Wildland-Urban Interface (light orange)—all relative to depictions of modeled fine-scale grizzly bear habitat use during summer (A) and fall (B; from Proctor & Kasworm 2020). Darker green denotes higher-probability and lighter green denotes lower-probability of use. The models used to produce these depictions incorporate effects of both habitat and human features.

and (2) that, because of this, the trade-off between natural fire and timber harvest/prescribed fire is largely a zero-sum proposition. Neither assumption is supported by the best available science, of which there is an enormous amount (e.g., Bessie & Johnson 1995, Moritz 1997, Barbero et al. 2014, Parks et al. 2018)—and a review of which is beyond the scope of these objections. Large fires will continue to burn, very likely affecting similar acreage, regardless of whether the Forest Service undertakes management actions proposed under Alternative 2. And, moreover, these wildfires will likely result in habitats that are more productive and secure compared to any produced by timber harvest (see F.1., above).

Parenthetically, the Forest Service further justifies fire suppression in combination with timber harvest and prescribed fire by claiming: "…a severe wildfire occurring on a large number of acres would greatly reduce both cover and forage compared to proposed harvest activities and prescribed fire" (pg 304, EA). Yet two pages later, in reference to the large Davis fire that burned during 2018, the Forest Service contradicts itself by stating: "…In the long term, this burn area is likely to be high-quality foraging habitat…," while also claiming on page 304 that timber harvest and prescribed fire under Alternative 2 will mimic <u>natural conditions</u> "…to which local bear populations are adapted." Of relevance, these natural conditions to which grizzly bears are purportedly adapted shaped the Yaak ecosystem for millennia.

In other words, the Forest Service has deployed inflated and contradictory claims together with logical gymnastics to reach the conclusion that timber harvest and prescribed fire will mimic the effects of natural disturbances on grizzly bear habitat (they won't; see F.1., above, also pg 82, BiOp), and that the agency will somehow preempt the large wildfires that produce demonstrable benefits for grizzly bears (it won't). Thus, according to this logic, the Forest Service is required to cut timber, employ prescribed fire, and maintain a supporting road infrastructure to meet habitat improvement goals for grizzly bears. It isn't.

F.2.a. The Forest Service Should Prioritize Natural Disturbance and Road Closures in Most of the Project Area

The obvious and more straight-forward alternative is to adopt natural wildfire and other disturbances as the primary habitat management tool for most of the Black Ram project, especially in areas farther removed from human habitations; drop all of the harvest units in these areas (see Point G, below); and, moreover, aggressively close/store roads in these same remote areas to remedy deficient habitat security in the Black Ram project area (see Point C, in toto, above).

As important as conforming with the best available evidence and standards for logical decision-making, an alternative that embraces natural processes while at the same time <u>substantially reducing</u> human disturbance is consistent with Forest Service management direction (GOAL-WL-01; pg 294, EA) as well as USFWS recommendations: "Continue to manage access on the Forest to achieve <u>lower road densities</u> and <u>higher [sic] amounts of secure habitat</u>," and "Where grizzly bear use is known or likely to occur and where practicable, <u>minimize or restrict disturbing activities or activities</u> that increase the likelihood of a human-bear interaction." (pg 219, BiOp). There is no reason why these latter directions and recommendations would be axiomatically trumped by another management direction (MA6-DC-VEG-

01), especially when the current preferred Alternative 2 is at odds with the best available science and does nothing to substantively improve deficient habitat security in the project area.

F.3. The Forest Service Failed to Address These Issues Raised in My Prior Comments

I raised most of the issues presented here in Point H of my previous Comments. The Forest Service addressed these comments with essentially a non-response. In fact, the main part of the Forest Service response entailed seizing upon a nit and picking at it; specifically taking umbrage at a statement I made regarding the Forest Service's tacit claim that it would "offset" harm caused by human activity under Alternatives 2 and 3 through improvements in habitat conditions (pg 121, Appendix G EA). Picking at nits does not amount to a substantive response. There is, moreover, ample reason to conclude that the Forest Service is, in fact, arguing that (1) it will improve habitat conditions (but see F.1, above), and (2) that any impacts attributable to increased human activity during execution of Alternative 2 is justified (off-set) by these improvements (see F.2., above).

Aside from this, the Forest Service employed the same device as it used to address most of my other comments, referring me and other concerned readers to "…the introduction of the grizzly bear section of this response to comments" and "…the EA for the assessment of risks related to and management [sic] of motorized access." However, the introduction to the Response to Comments section does not in any way address the issues I raised regarding the efficacies of timber harvest and scientific basis for claims made by the Forest Service regarding these efficacies. Points C and E, above, also elaborate why the EA does not, in fact, adequately assess risks related to management of motorized access, especially in relation to Alternatives 2 and 3.

In short, the Forest Service yet again failed here (as well as per Points A, B, and C, above) in fiduciary duties to the American public that include substantively engaging with issues raised in public comments rather than resorting to *pro forma*, insubstantial, and trite non-responses.

G. Evaluation of Connectivity and Geospatial Configuration of Secure Habitats Is Inadequate

The Forest Service references several management directives in the Black Ram EA to create and maintain landscapes that promote and sustain connectivity for the Yaak grizzly bear population, including FW-DC-WL-02 ("A forestwide system of large remote areas…") and FW-DC-WL-17 ("Forest management contributes to wildlife movement within and between national forest parcels"; pg308, EA). The Forest Service then goes on to assert that these directives have been fulfilled, stating that "Desired conditions for the Yaak geographic area…include broad areas for movement provided from Buckhorn Ridge to Northwest Peaks and along the Canada-U.S. border" (pg 294, EA); "…large blocks of core facilitate movement throughout the BMUs, into adjacent BMUs, and north into Canada" (pg 297, EA); and, with regard to the Alternative 2, "Landscape connectivity would remain unaffected in the long term."

In every instance where the adequacy of current connectivity in the Black Ram project area or BMUs 14 and 15 is asserted, the primary landscape features invoked to justify this assertion are the Inventoried Roadless Areas (IRAs) #663 and #694 (Northwest Peaks & West Fork Yaak).The Forest Service moreover assumes that standards for defining secure core ("blocks") and for percent total secure habitat in any given BMU are adequate and defensible. They are not, nor, after critical assessment, are IRAs 663 and 694 likely to be sufficient for providing secure connectivity between adequately secure blocks of habitat to the west, north, and east.

G.1. The Forest Service Failed to Address Comments Regarding Inadequate Geospatial Configurations of Secure Habitat

I raised these issues in Point I of my earlier comments. As with so many of my comments, the Forest Service response amounted to "…see the introduction to the grizzly bear section of this response to comments," followed by "Potential cumulative effects were considered in the EA" (pg 121, Appendix G, EA). In fact, none of the substantive issues I raised in my comments were addressed in either the Introduction to the Grizzly Bear Section of Responses or in the EA. In fact, as I note immediately above, the EA dealt with the issue of connectivity and "geospatial context" by simply asserting the adequacy of (1) grizzly bear habitat security standards and (2) IRAs 663 and 694, the latter without offering any substantiating evidence or analysis.

I address the inadequacy of habitat security standards in Points C and B, above. Here, I address the adequacy of Inventoried Roadless Areas within the Black Ram project area for ensuring population connectivity for grizzly bears and the related Forest Service assertion that existing conditions are not only sufficient, but likely to be unimpaired by Alternative 2 project activities.

G.2. Existing Connectivity in the Black Ram Project Area is Inadequate

When assessing connectivity—which is fundamentally a geospatial consideration—it is imperative to look at configurations of secure habitat in map form using the best available scientific information along with other pertinent information. The Forest Service does not do this in the Black Ram EA, certainly not in any explicit form.

As remedy, Figures 5 and 6 (above) shows key features of the Black Ram project landscape, with an emphasis on IRAs (in dusky green); zones relegated to intrusive mechanical treatments by virtue of being within a designated wildland-urban interface (dusky pink); areas impacted by proposed mechanical harvest and related hauling activities under Alternative 2 (red blocks with orange zones of influence); along with the route of the upgraded Pacific Northwest Trail (in lavender). These features are overlain in Figure 5 on two different but complementary reckonings of joint habitat security and productivity introduced under Point C.3.b, above (Mattson & Merrill 2004, Proctor et al. 2015) and, in Figure 6, on recent maps of fine-scale habitat selection from Proctor & Kasworm (2020).

Several patterns are noteworthy. Most prominently, the IRAs are attenuated and intruded upon by "cherry-stems" that accommodate existing motorized access. The two roadless areas are furthermore bisected by Forest Road 747-748. More importantly, IRA 694 coincides with an area identified as being only a marginally functioning grizzly bear population source area (Mattson & Merrill 2004; Figure 5b), well outside any areas serving as core or high probability dispersal habitat (Proctor et al. 2015; Figure 5a). Figure 6 also shows some problematic patterns, most notably the extent to which Harvest Units 19-

25, 32-44, and 79-83 along with associated road systems intrude upon areas of highly productive summer habitat (Figure 6a); and extent to which existing road systems in and near the IRAs already compromise grizzly bear habitat use, with greater impairment promised by additional activity associated with Harvest Units 66-78.

There are four main points to be drawn from these patterns. First, designation of an area "roadless" under Roadless Rule criteria is not tantamount to supporting adequate landscape-level connectivity for grizzly bears. Second, the two IRAs in the project area are compromised by intrusions of motorized access, as well as by non-motorized human use of the PNT and associated spurs (see H.1, below). Third, the attenuation of these IRAs, especially through core portions of the Black Ram project area, reduce the intrinsic ability of these roadless areas to provide security for bears that use them (i.e., the ratio of edge to core matters; e.g., see Mattson & Merrill [2002]). Fourth, there is no empirical support for concluding that IRA 694 adequately functions as connective habitat within the project area.

Given these considerations, the overall configuration of large blocks of putatively secure habitat in the Black Ram project area is problematic. Most prominently, there is no defensible basis for concluding that there is functional connectivity west-east across the northern portion of the project area, along the Canadian border and between the Northwest Peaks and the West Fork of the Yaak River. This lack of connectivity impairs the capacity of central portions and the eastern half of the Black Ram project area to sustain source conditions for the Yaak grizzly bear population, which is in turn critical to doubling the densities of grizzlies in this area and thereby achieving even the minimal definition of recovery posited by the USFWS.

Forest Service arguments based on assertion and *ad nauseum* repetition do not remedy nor address this evidence for deficient connectivity in the Black Ram project area under baseline conditions. There is certainly no credible evidence to support concluding that IRAs in the project area *do* sustain adequate connectivity. By contrast, the most prudent, precautionary, and defensible conclusion is the opposite—that current connectivity is inadequate, especially given deficiencies in overall levels of security within BMUs 14 and 15 (see Point C, above).

G.3. Alternative 2 Will Further Impair Already Inadequate Connectivity

Again, a visual depiction (Figure 5) is requisite to judging the effects of Alternative 2—indeed the effects of all alternatives considered in the Black Ram EA—on geospatial configures of project activities and secure grizzly bear habitat.

Several problematic patterns are clear. For one, a significant portion of mechanical harvest units are to the north and west of the IRAs, impairing the security of habitat in this remote portion of the Black Ram project area, and dictating increased traffic along FR 747-748 to accommodate not only removal of cut timber, but also post-harvest treatments. This unambiguously worsens conditions for grizzly bears, certainly for the duration of the project. A number of other harvest units and associated road infrastructure is located near or immediately adjacent to and impinging upon the IRAs at four different locations. Of these, the harvest units and associated roads fed by FR 757 in the West Fork area are especially problematic by sitting astride potential connectivity between northwestern and northeastern portions of the Black Ram project area.

The bottom line here is that Alternative 2, and indeed none of the alternatives considered in the Black Ram EA, will remedy a deficient situation insofar as security and connectivity are concerned. As certain, Alternative 2 will create additional impairment for at least the duration of the project.

G.4. The Black Ram Project Needs to Drop Alternative 2 and Develop an Alternative That Substantially Increases Habitat Connectivity and Security.

The implications of and remedy for my objections up to this point are relatively straight-forward. (**1**) At a minimum, the Black Ram Project needs to develop and adopt an alternative that more aggressively restricts motorized access and eliminates regeneration and intermediate harvest units planned for problematic locations. (**2**) More specifically, the harvest units to be eliminated include—but are not limited to—Units 19-25, 32-36, 42-44, and 66-84. (**3**) In addition to, at a minimum, gating and restricting access to administrative personnel on FR 757 and its associated road system, the Forest Service likewise needs to restrict access to the terminus of FR 5857 beyond Unit 41. (**4**) Given the need to improve security for grizzly bears (as per Points A-E, & G.4., above), the Forest Service would ideally also gate and restrict access to FRs 3389, 5894, 5896, 5900, 5902, and 5910; and consider restricting public access to FRs 338 and 747 along with distal portions of FR 748 passing near or through IRAs. (**5**) At a minimum, the Forest Service, in cooperation with Montana Fish, Wildlife & Parks, should target the environs of FRs 5857, 338, 747, and distal portions of 748 for an increased law enforcement presence.

H. The Forest Service Did Not Adequately Analyze Cumulative Effect

The Forest Service has both a legal duty as well as a moral and pragmatic obligation to analyze the effects of Alternative 2—and other Black Ram alternatives—on grizzly bears, in combination or synergy with the effects of other past, on-going, and reasonably foreseeable environmental changes. Given the vagaries of policy directives, legal duties allow from ample game playing, including the pretense that climate change does not exist. However, pragmatism as well as ethics dictate that the Forest Service give full and meaningful consideration to the cumulative effects of all past, on-going, and foreseeable environmental changes—human or natural—likely to substantively affect grizzly bears. This unambiguously includes the effects of on-going and foreseeable climate change.

My life-time of experience with cumulative effects analysis informs this portion of my objection. I was central to developing the concept and tools of cumulative effects analysis (CEA) for application to grizzly bear management, not only in the Greater Yellowstone Ecosystem, but also in Canada (e.g., Mattson et al. 1986, 2004; Mattson & Knight 1991; Mattson 1995; Weaver et al, 1986). I am well-acquainted with the issues of dimension, temporal scale, and spatial extent in application to CEA—including, again, the games that can be played to avoid confronting challenging ecological and management issues.

Without mincing words, the Forest Service analysis of cumulative effects in the Black Ram EA is grossly deficient. I broached this issue in Points I and J of my Comments. The Forest Service response, yet again, failed to engage substantively with the issues that I and others raised on this front (e.g., #205, pg 119;

#219 & 220, pg 121, #226, pg 122, Appendix G, EA), resorting, yet again, to bland assertions such as "potential cumulative effects were considered in the EA," "Cumulative (i.e., synergistic) effects were analyzed in the EA," and "…a cumulative effects analysis was completed for this project." Yet the referenced cumulative effects analysis remains demonstrably deficient. This Forest Service tactic is little better than that of a someone in a school yard presuming to refute a genuine concern or cogent argument by asserting previous assertions ever more forcefully.

I elaborate on several issues related to cumulative effects below.

H.1. The Yaak Region and Next 100-Years are the Appropriate Scales for Reckoning Cumulative Effects

As I note under Section A, above, the Forest Service repeatedly invokes the status of grizzly bears throughout the entire Cabinet-Yaak Ecosystem going back to 1983 as context for judging security standards for the Kootenai National Forest as well as effects of the Black Ram project. Yet the putative analysis of cumulative effects on page 306 of the EA is limited to planned or on-going human activities in or immediately adjacent to the project area. This mismatch of time-scales and spatial extent is inexplicable and arbitrary, especially in ecologically meaningful terms.

More to the point, the most meaningful spatial scale for reckoning cumulative effects of the Black Ram project is the full extent of the Yaak (even Yahk) grizzly bear population. Given that the Yaak/Yahk population is genetically and demographically semi-isolated (see Point A.2.a, above), the entire Yaak/Yahk region logically bounds the ecological and demographic phenomena that dictate the fates of grizzly bears likely to occupy the Black Ram project area now and in the foreseeable future. Having said this, it is also demonstrably the case that the climate of this region is fully contiguous with that of North America—at a minimum. It does not exist in a hermetically sealed bubble.

The appropriate temporal extent is fuzzier. However, given that demographic responses by grizzly bears to environmental change are likely to lag by at least 10 years (Doak 1995), past actions 10-years old should reasonably be considered. The combined temporal and spatial specifics of landscape dynamics are uncertain, but variations in fruit abundance play out over periods of 20-60 years in a mosaic largely dictated by the frequency and extent of fires—especially large fires (see F.1, above, and Martinka [1976], McLellan [2015], Proctor et al. [2017]). Looking to the future, projections of climate and related ecological change are typically least uncertain at scales of 50-100 years—long enough to encompass the interplay of short-term dynamics and longer-term trends (see H.4, below). Insofar as human activities are concerned, the Kootenai Forest LMP presumes to cover matters on that front out for 10 years or so. These considerations recommend a temporal window extending reaching back 10 years in the past and projecting 100 years into the future.

Lending weight to this conclusion, the acute vulnerability of the Yaak/Yahk grizzly bear population to decline and even extirpation (see Point A.2, above) demands prudent consideration of dynamics playing out over the next century—the most common time-frame invoked in population viability analyses (see Point A.2.b. above). Even though the specifics of these dynamics cannot be reliably foreseen or controlled over a period this long, they nonetheless impose the need to create an environment that buffers grizzly bears against longer-term risks. The obvious way to do this is by creating a much more secure environment for bears through substantial increases in law enforcement (see Point B.3, above) and limitations on intrusive human activities (see points F.2.a and G.4, above).

More specifics follow.

H.2. Effects of the Pacific Northwest National Scenic Trail Were Not Adequately Addressed

Several commenters raised concerns about inadequacies of the Forest Service analysis regarding impacts of the Pacific Northwest National Scenic Trail (PNT). The Forest Service response was, yet again, an *ad nauseum* argument rather than one of substance: for example, #207, pg 119 of Appendix G, "The EA reports the potential effects of reasonably predictable trail use"; #220, pg, 121 "Please see the introduction to the grizzly bear section of this response to comments. Cumulative (i.e., synergistic) effects were analyzed in the EA"; and #225, pg 122 "The potential cumulative effects of PNNST activity were addressed in the EA."

The Forest Service provides an additional response to #225, pg 122 of Appendix G: "…there is a lack of definitive research relating population-level impacts from non-motorized trail use [sic]. Current use of non-motorized routes in general, and the PNNST route specifically, do not indicate high-use is occurring…" This last statement is inconsistent with implications of the best available science—Forest Service protests notwithstanding. The statement is also a telling window into how Forest Service allocates burden of proof in service of expediency.

The portion of this statement regarding "lack of definitive research" is a classic *ad ignorantiam* argument that requires an impact or effect to be proven beyond any doubt. Otherwise, such an impact is assumed to not exist. This is certainly not precautionary. The disposition of evidentiary burden also begs for an explanation. Is any impact deemed to be problematic for the Forest Service position burdened with need for definitive proof, whereas any position deemed favorable given the benefit of doubt? Such dispositions bespeak an arbitrary and politicized treatment of science by the Forest Service.

More specific to the best available science, Mattson (2019; cited by the USFWS, pgs 44 & 93, BiOp) provides the best current compilation and synthesis of science regarding effects of hikers and other pedestrians on grizzly bears, including a specific application to the PNT (Mattson 2019: Section 8.b). Briefly, the main conclusions are (quoting from Mattson [2019]: pgs 41-43):

- Whether judged in absolute or comparative terms, foreseeable pedestrian activity on the proposed PNT is guaranteed to adversely affect the small highly vulnerable population of grizzly bears in the Yaak region.
- Spatial overlap with the highest regional densities of grizzly bears alone guarantees a high likelihood of encounter between trail users and bears with both short- and long-term impacts.
- Perhaps paradoxically, impacts will likely be exacerbated by low grizzly bear densities and pedestrian traffic light enough to preclude predictability for bears.

- Under these circumstances, grizzly bears stand a good chance of being “startled” or “surprised” by trail users, or by simply responding as if encounters posed a threat.
- Grizzly bears will likely avoid the PNT as a natural consequence of strong reactions to encounters with trail users (Section 6.a.), with resulting alienation from otherwise important foraging habitats and displacement into lower-elevation areas that are likely to be less secure from human-caused mortality.
- Finally, hazards will be amplified for people and impacts accentuated for bears to the extent that off-trail pedestrian activity increases, the PNT is used by mountain bikers, or spur trails are constructed through high-elevation open habitats.

Mattson (2019) and the conclusions therein were referenced in submitted comments (Point J of Comments). However, the Forest Service altogether failed to consider the best available science in this report and, instead, fell back on an outdated and unsubstantiated invocation of “high-use” versus “low-use” for reckoning probable impacts of trails and trail-related human activity on grizzly bears. This deficiency needs to the rectified.

H.3. The Forest Service Failed to Adequately Assess Implications of the Davis Fire and Other Wildfires

The Davis fire that burned a large area in the northwest quadrant of the Black Ram project area during 2018 has clear implications for Alternative 2. The Forest Service assessment of these implications amounted to little more than noting: “In the long term, this burn area is likely to be high-quality foraging habitat as soon as nutritious vegetation is established.” However, the implications go beyond this *pro forma* statement.

Notably, the Davis fire obviated any presumed need to “maintain,” “improve,” or otherwise “move” habitat conditions for grizzly bears in the area between Inventoried Roadless Areas #663 and #694 and the Canadian border. Consistent with my recommendations under G.4, above, there is no probable benefit to proceeding, at a minimum, with Harvest Units 66-68 as means of somehow remedying deficient habitat trends and conditions in this area. Moreover, natural wildfires will almost certainly continue to create beneficial habitat conditions for grizzly bears in the majority of the Black Ram project area given (1) the certitude of wildfires in the foreseeable future (see H.5, below) and (2) the almost equally certain inability of Forest Service managers to control wildfires during extreme fire weather events that will become more common (see F.2, above). This is not mere speculation. Moreover, for the Forest Service to maintain otherwise stretches credulity and runs counter to a large body of research on wildfire history in the northern Rocky Mountains.

The area within 10 miles of the Black Ram project provides evidence for these last points, as well as the likelihood that wildfires will provide any habitat enhancements needed to sustain and recover grizzly bears without the need for intrusive human activities associated with mechanical harvest or prescribed wildfire. During the last 30 years alone, over 58,000 acres have burned, largely as a result of just 5 large fires each >5,000 acres in size (Caribou, Davis, Keystone, North Fork of Big Creek, and Upper Beaver), and this despite the best efforts of the Forest Service to extinguish them.

H.4. Effects of Other Existing and Planned Projects in the Yaak Were Not Adequately Addressed

The Kootenai NF recently issued a scoping notice for another large "restoration" project – called Knotty Pine – roughly 10 miles south of the Black Ram project, encompassing a substantial portion of grizzly bear distribution in the Yaak region. As with the Black Ram project, this project also involves road construction, additional roads added to the National Forest Road System, and 14 regeneration and intermediate harvest aeras >40 acres in size, including one of more than 200 acres.

Knotty Pine is the fourth "restoration" project in western portions of the Yaak, encompassing the full arc of grizzly bear distribution from the Canadian border in the north to the Kootenai River in the south (Figure 7a). In addition to Knotty Pine and Black Ram, the Kootenai NF also approved the Buckhorn Project circa 2014 and the Lower Yaak, O'Brien, Sheep ("OLY") Project in 2016. Including Alternative 2 of the Black Ram project, cumulative impacts of these contiguous projects will have unfolded, and continue to unfold, over a 10-year period.

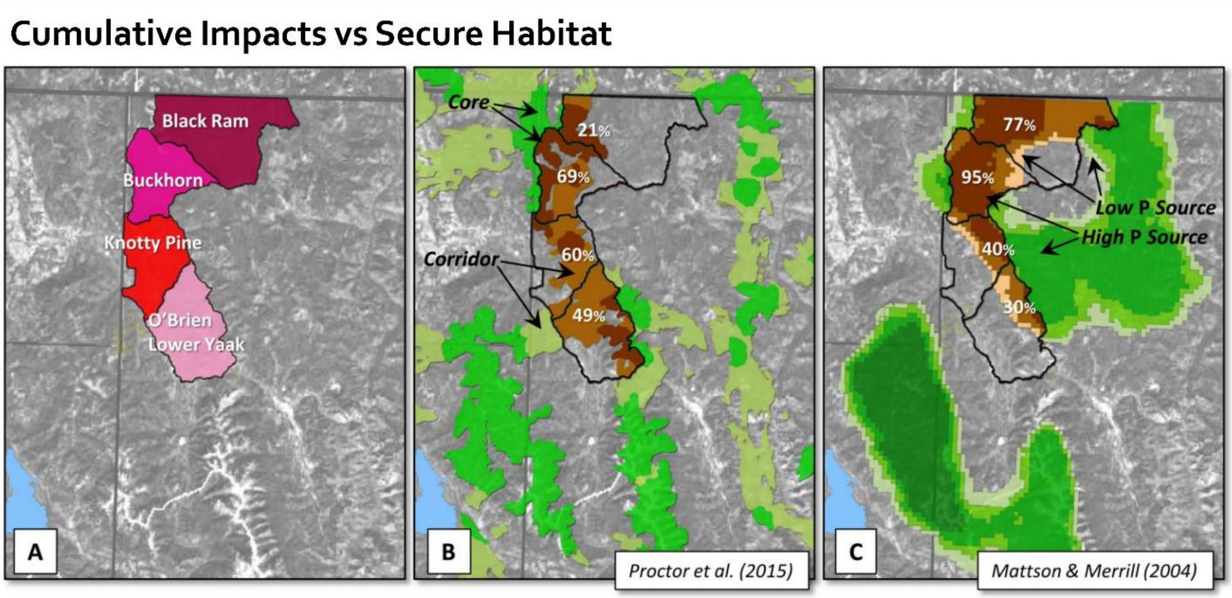

Figure 7. These maps show the four planned or on-going restoration projects on the Kootenai NF that encompass the entire western periphery of the Yaak grizzly bear population's distribution, stretching from the Canadian border on the north to the Kootenai River on the south. Panel (A) features these areas, each named and denoted by a different color. Panels (B) and (C) show the overlap of each project with two different depictions of core or source grizzly bear habitat. Panel (B) shows results from Proctor et al. (2015) featuring core and dispersal habitat, with core habitat shown in dark green outside of project areas and dispersal areas as light green. Areas of each overlapped by the projects are shown in dark- and light-brown, respectively. Percent total overlap of both is also shown by project. Panel (C) shows overlap of project areas with population source areas modeled by Mattson & Merrill (2004), following the same color schemes. Darker green or brown denotes areas with a higher-probability and lighter green or tan denote areas with a lower-probability of being population sources. As in (B), percent total overlap is showns for each project area.

As with the Black Ram project, there is little plausible basis for concluding that the cumulative effects of the other three projects along the western rim of the Yaak are benign—certainly not beneficial. As with the Black Ram project (see all my points up to here), grizzly bears will have likely been harmed and deficient habitat and security conditions more certainly perpetuated. Given the large home range sizes of grizzly bears in this area (Kasworm et al. 2020: Appendix 4), impacts of these projects will have accrued across boundaries and over time (as per the criterion that secure "blocks" need to be left free of intrusion for a minimum of 10 years).

The Forest Service assessment of these probable project-related cumulative effects amounts to: "The Buckhorn Project is partially in BMU 14 and is ongoing. All harvest has been completed, as well as most of the post-harvest burning. Several of the landscape burns have been completed also" (pg 306, EA), to which was added: "It is also in this project where we have photographic documentation of a sow grizzly with a cub on a gated road between several harvest units, as well as several other individual grizzlies in the same site." This assessment is, at best, a cypher given the probable true complexity and extent of cumulative effects broached here, with this deficiency compounded by the disingenuous invocation of anecdote as presumed reliable evidence for lack of impacts or even for benefits.

Figure 7 shows additional information that flags potentially problematic cumulative effects of the four on-going or planned projects on western margins of the Yaak related to overlap with major areas of ostensibly secure core and source habitats identified by Proctor et al. (2015; Figure 7b) and Mattson & Merrill (2004; Figure 7c). The percentages in each panel show the extent of overlap by each project area with core, dispersal, or source habitat. The models are in greatest agreement about the extent of overlap by the Buckhorn and Knotty Pine projects, with the source areas substantially overlapped in the Black Ram area, and core and dispersal habitat substantially overlapped in the OLY area.

Although not a definitive reckoning of impacts, these patterns are cause for concern and yet more reason for the Forest Service to treat an analysis of cumulative effects seriously rather than as what the Forest Service seems to view an inconvenient exercise to be addressed *pro forma*. The Forest Service needs to remedy this deficiency by undertaking a good faith analysis of cumulative effects arising from these four contiguous on-going and proposed projects.

H.5. On-Going and Foreseeable Effects of Climate Change Were Not Addressed

Anthropogenic climate warming is real (IPCC 2013, Joyce et al. 2018) and tracking a worse-case scenario (Schwalm et al. 2020), with potentially catastrophic implications for life on Earth (IPCC 2019). To deny this reality is tantamount to embracing ignorance and fantasy. More importantly, for public servants to willfully not consider impacts of climate warming on imperiled species is a betrayal of trust responsibilities held on behalf of the American public. Of relevance to the Black Ram EA, failure of the Forest Service to consider impacts of on-going and foreseeable climate warming on Yaak grizzly bears as part of a cumulative effects analysis is scientifically and morally inexcusable; and the impacts are likely to be substantial.

H.5.a. There Will Be Less Fruit in the Yaak

Huckleberries are a critically important food of grizzly bears in the Yaak (Kasworm et al. 2020), with interannually availability of fruit production governed by annual and seasonal weather (Holden et al. 2012). This interannual variation has implications for the distributions and demography of bear populations that are reliant on huckleberries (McCall et al. 2013), including grizzly bears in the Yaak region (Proctor et al. 2017). Crops of other heavily-consumed fruit such as serviceberry and buffaloberry also vary substantially from one year to the next (Kasworm et al. 2020), although with less conclusively demonstrated effects on distributions and demography of grizzly bears.

The recently published paper by Prevéy et al. (2020) is thus of considerable importance. This research shows a high probability that climate conditions favorable to huckleberry will diminish during the next 50-100 years in the Yaak region. This diminishment will almost certainly affect the distribution and density of Yaak grizzly bears, more likely in detrimental rather than neutral or beneficial ways.

H.5.b. Increased Wildfire Will Change the Yaak Landscape

The scientific literature covering foreseeable effects of climate warming on wildfire regimes in the West is compendious. A review of this literature is beyond the scope of my objections, although of relevance to analyzing foreseeable impacts of climate change on grizzly bears in the Yaak. What immediately follows thus references only a small fraction of the relevant literature, with the burden of more fully uploading and applying this enormous body of scientific research falling on the Forest Service.

Briefly, Wildfires in the western United States are being increasingly driven by extreme or severe fire weather conditions, resulting in more frequent large and erratic wildfires (e.g., Luo et al. 2013, Barbero et al. 2015, Abatzoglou & Williams 2016). This increase in extreme fire weather is, in turn, linked to on-going climate change, ultimately driven by anthropogenic warming (e.g.; Kirchmeier-Young et al. 2017, Abatzouglou et al. 2019). Although projected changes in wildfires regimes are heterogenous across western North America, there is consensus that large wildfires will become more common in the Yaak region (Barbero et al. 2015, Littell et al. 2018, Brown et al. 2020), and that post-fire succession will likely produce lasting changes in vegetation composition and structure (e.g.; Keane et al. 2015, 2018).

All of this will obviously affect Yaak grizzly bears, including those occupying the Black Ram project area. This follows from the simple fact that grizzly bear habitat selection in this region is correlated with vegetation composition and structure, including patterns produced by wildfire (see Point F.1, above). Although the exact effects on grizzly bears are intrinsically uncertain given the complexity of the Yaak ecosystem, this uncertainty contains its own lesson and related mandate. Rather than blithely assuming stasis or that increased wildfire will produce beneficial changes, as is the Forest Service’s current default stance, the prudent approach is to use uncertainty to craft precautionary management actions during the next decade.

H.5.c. Implications for Yaak Grizzly Bears and the Black Ram EA

The future will almost certainly bring less productive conditions for grizzly bears in the Yaak; changes in distributions of productive patches; and related changes in distributions of bears relative to humans and human facilities. Intrinsic carrying capacity for bears will also very likely decline (see Proctor et al. [2017]). The vulnerability of an already acutely vulnerable grizzly bear population in the Yaak will correspondingly increase.

Parenthetically, the often-repeated assertion that grizzly bears are unaffected by environmental change simply because they are adaptable omnivores is without merit. The reasons are simple. The quality of different grizzly bear foods varies by orders of magnitude, with dramatic effects on digestibility and availability of energy and nutrients (Mattson et al. 2004). These differences in food quality interact with differences in food abundance to in turn produce orders-of-magnitude differences in grizzly bear densities in North America (Mowat et al. 2013), as well as detectable differences in bear densities even within the much smaller spatial extent of southeastern British Columbia (Apps et al. 2016, Proctor et al. 2017).

Implications for the Forest Service are straight-forward. Rather than blindly continuing to employ deficient security standards for grizzly bears in the Yaak region and in the Black Ram project area (as per Points C-D & G, above), and, moreover, manage to the bare minimum required of even those deficient standards, the Forest Service needs to set about proactively and aggressively increasing the extent of secure habitat for grizzly bears in the Yaak and, through this, increase the literal and figurative buffer for this population against foreseeable future exigencies.

H.6. A Worsening of Population Trend is Evidence of Problematic Cumulative Effects

The existence of problematic cumulative effects is given further weight by the updated information on cumulative and current growth of the female subpopulation of the Yaak area shown in Figure 12 of Kasworm et al. (2020; see also my previous Comment A for clarification of what these growth rates do and do not signify). This figure shows a reduction in the annual rate of increase in growth rate (i.e., the first derivative) that began in 2014. Importantly, this decline accelerated during the last two years (2018-2019). A decline in the current (not historical; i.e., 1983-2012) population growth rate axiomatically must be substantial to have drawn down a central estimate back-weighted by over 30 years of irrelevant data—which is to say, data from 1983-2012 that offer no information about conditions unfolding during the last 5-6 years. As I emphasize in Point A, above, and in Point A of my Comments, this adds further weight to the conclusion that population status has worsened, not improved, since 2012, most likely because of cumulative human and environmental effects.

I. Recommended Solutions and Proposed Resolutions

For all of the reasons articulated above, the Decision Notice & FONSI and final Environmental Assessment for the Black Ram Project fail to conserve grizzly bears on the Kootenai National Forest and fail to include the plan components or ecological conditions necessary to contribute to the legal fulfillment of grizzly bear recovery. Furthermore, the Black Ram Environmental Assessment fails to fulfill NEPA requirements to adequately evaluate and analyze the direct, indirect, and cumulative impacts of all Alternatives considered in the Black Ram Project on grizzly bears, grizzly bear habitat, and grizzly bear recovery on the Kootenai National Forest and in the larger Yaak/Yahk region. The related Endangered Species Act Section 7 consultation documents and Biological Opinion also fail this requirement. The Black Ram Environmental Assessment additionally fails to fulfill NEPA requirements to meaningfully engage with and address comments submitted and concerns raised by the public.

In light of these legal deficiencies I respectfully offer the following solutions and remedies:

I.1. The Kootenai National Forest needs to develop and adopt an Alternative that fulfills ESA requirements to recover the Yaak population of grizzly bears in the Cabinet-Yaak Recovery Area. Such an Alternative should include the following:

I.1.a. Wildfire caused by natural ignitions should be adopted as a primary mechanism of vegetation change in the Black Ram Project Area outside of the designated Wildland-Urban interface. This provision needs to be included for factual reasons (large wildfires will continue to burn, likely with greater frequency) and as a means of creating habitat conditions of greater utility and value for grizzly bears compared to habitat conditions created by mechanical treatments.

I.1.b More specifically, and at a minimum, Harvest Units 19-25, 32-36, 42-44, and 66-84 should be dropped from consideration because they are planned for areas where impacts on grizzly bears will be greatest. Abandonment of these Units will serve to reduce spill-over effects on secure habitat conditions in existing Inventoried Roadless Areas and also help to maintain and restore habitat connectivity for grizzly bears east-west in the northern half of the Black Ram Project Area.

I.1.c. As a related measure, access to FRs 3389, 5894, 5896, 5900, 5902, and 5910 should be restricted by gates and other measures. Restrictions on public access to FRs 338 and 747 along with distal portions of FR 748 passing near or through Inventoried Roadless Areas should also be implemented on a seasonal basis. These measures would serve to reduce current harm caused by road-related habitat alienation and also serve to reduce levels of malicious or other illegal killing facilitated by road access into potentially secure habitat.

I.1.d. As part of this preferred Alternative, the Forest Service should also establish a minimum size for determining patches or "blocks" of secure grizzly bear habitat in the Black Ram area—and, indeed, Forest-wide. To be functional and scientifically defensible, this minimum size criterion should be >>2,250 acres and ideally nearer 4,000 acres.

I.1.e. In addition, this preferred Alternative should include provisions, as per those listed above, that increase the amount of secure grizzly bear habitat in BMUs 14 and 15 to >75%. This amount of secure habitat would comport with the best available science and align these portions of the Kootenai NF with well-established and well-justified norms for managing habitat security in other Grizzly Bear Ecosystems.

I.1.f. Information in Proctor et al. (2017) provides guidance on measures needed to bring current very low grizzly bear densities (roughly 4.5 bear /1000 km^2) to levels needed to meet the U.S. Fish & Wildlife Service minimalist population recovery goal (roughly 9 bears/1000 km^2)—amounting to an approximate doubling of grizzly bear numbers. Proctor et al. (2017) estimate that grizzly bear densities in adjacent portions of British Columbia increase by 7% for every 0.1 km/km^2 reduction in road density. Applied to BMUs 14 and 15, a doubling of bear densities thus translates into BMU-wide reductions of average road density by 0.6 km/km^2 (ca. 1 $mile/mile^2$). In other words, the preferred Alternative should include provisions that reduce BMU-wide average road densities by 1 $mile/mile^2$.

I.1.g. Finally, this preferred Alternative should contain explicit provisions to increase the presence of law enforcement and investigation officers in the Project Area, whether through funding Forest Service positions or cost-share arrangements with Montana Fish, Wildlife & Parks to support increased numbers of Wardens. This provision would help address the factual reasons that virtually all adolescent and adult grizzly bears die in the Cabinet-Yaak Ecosystem—from people illegally killing them or because black bears hunters mistake a grizzly bear for a black bear.

I.2. The Kootenai National Forest needs to adequately fulfill duties required by NEPA. At a minimum, this includes:

I.2.a. Complete an analysis of the cumulative effects of past, present, and foreseeable environmental changes in the Yaak region that comports with the best available scientific information and offers a realistic, rather than arbitrary and capricious, assessment of how these changes in the human and natural environments have affected and will foreseeably affect grizzly bears. This analysis should employ a scientifically defensible spatial extent (the entirety of the Yaak region) and time-frame (e.g., 10 years into the past and 100 years into the future—the latter to address viability concerns and climate change).

I.2.b. Take an evidence-based and scientifically defensible hard look at the actual reasons why grizzly bears die on the Kootenai National Forest (i.e., from malicious and other illegal human causes and from black bear hunters mistakenly identifying a grizzly bear) and at patterns of grizzly bear habitat use and selection. This latter consideration entails a meaningfully rather than capricious assessment of the comparative benefits of wildfire versus mechanical treatments; the impacts of roads; and adequacy of current habitat connectivity.

I.2.c. Engage in a meaningful and substantive way with comments submitted by the public in response to Alternatives developed and analyzed for the Black Ram Project under NEPA provisions. My comments above provide evidence of the Forest Service's systematic disregard for and dismissal of substantive issues raised by the public regarding Black Ram Project Alternatives. This pattern is not only arbitrary and capricious, but also gives the appearance of serving politically pre-ordained outcomes. As such, the response to public comments in Appendix G of the final Black Ram EA not only disrespects the concerned public, but also further undermines public confidence in Forest Service decision-making.

These objections are respectfully submitted by:

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