**Editor**

Clarify the type of manuscript this is, and follow the journal guidelines for that manuscript type. Reviewers noted that this was submitted as a note, and reads like a note, but is actually long for a Contributed Paper. Another reviewer felt that, lacking new tests of existing hypotheses, or new hypotheses, this reads more like a perspective; which it is too long to be considered.

1. Agreed, the manuscript type was a mistake on our end. We have remedied this issue in the new submission and shortened the manuscript by 850 words.
2. We address the hypothesis critique in detail to Reviewer 1comment 1 below, but in short, this manuscript was not meant to test new hypotheses. Rather its’ intent is to spark conservation action and provide wildlife managers the actionable evidence they need to do so.

There are too many Figures and inserting them in compound figures is not helping your points. The font sizes on most graphs are far too small for printing in a journal. The white outline box in the inset map of Figure 1, showing the study region is, similarly, too faint. There is likely no need for Figure 3.

1. We’ve resolved the figure text size in all cased by increasing text size, removing sub headers, and have thickened the white outline in the map.
2. We’ve discussed the article length and figure/table count with senior AE Dr. Gilkman who has permitted the length and figure/table count given the abundance of data in the manuscript, complexity of the issue, and overall goal to spark action via perhaps non-conventional communication of the issues in conjunction with scientific rigour (i.e., why Fig 3 is embedded in there to give folks less interested in the numbers a “real” look at the issue).

**Reviewer: 1**  
  
Comments to the Author

In this article, the authors present demographic data for a grizzly bear population in Elk Valley, BC and infer that annual immigration of bears offsets high mortality rates, creating a "conflict spiral". The authors' statement of how this study fits in with earlier work is helpful but after reading the manuscript I am not convinced that this presents substantial, new information compared with Lamb et al. (2017). There are several primary issues that I will highlight first, followed by line-specific comments and editorial suggestions.

1) In the introduction there is no mention of what hypothesis you are testing beyond those already tested in Lamb et al. (2017; which stated "We tested the hypothesis that an area with intensive human development and rich food resources would produce fitness consequences for a population of grizzly bears because of decreased survival in the trap and net immigration into the trap from adjacent source populations."). It is critical for the reader to understand what new questions and hypotheses are being addressed, if any. If not, a 'perspectives' article would seem to be a better fit for this topic.

A. We appreciate that Reviewer 1 is looking for justification how this work is different from previously published results, and specifically what the newly testes hypotheses are. We have strengthened the justification and distinction in the intro to the degree possible. But overall, we think it’s important to make clear that this paper is not necessarily testing “new” hypotheses, it instead has two main goals:

* 1. Provide demographic and conflict metrics to give wildlife managers a sense of the issue and do so with data types they are familiar with and more likely to “believe”. Reviewer 1 is correct that some of this source-sink dynamics has already been shown in Lamb et al. 2017, but we did that with DNA data and capture-recapture analyses. Since that time our experience trying to get actionable outcomes on the ground from that work has been limited, mostly due to wildlife managers not really understanding or appreciating the value of genetic tagging. Instead, they are used to collaring-type data. With the DNA data we can get general trends at a large extent, which is its strength. But it doesn’t provide any dead bears, cause of death, or even rates of immigration (some spatial CR methods can, but its tenuous and data intensive). All this weakened our ability to convince managers there was an issue. So here we have tried to advance the issue on the science side by providing more specific, mechanistic insights that include cause-specific mortality, actual estimates of immigration, etc.
  2. Building off 1, our goal here is to provide spark for action and a bit of a blueprint on what next steps would be. That is why a portion of the discussion strays from the strict data presented here and expands into our collective experience working on grizzly bear demography and human-wildlife conflict to provide actionable solutions.

So the paper has scientific advances that are well above and beyond Lamb et al 2017, but also isn’t ground breaking in regards to testing a new hypotheses. It’s meant to spark conservation action.

2) There's an ad-hoc aspect to the methods and these may require better justification or consideration of more established techniques. For example, it seems to me that the Cherry et al. (2002) method is a more robust approach to estimation of unreported mortality in grizzly bears. You created an "ensemble estimate", without properly explaining how the 3 metrics were combined. Is this truly an ensemble estimate? There are 3+ pages explaining procedures for estimation of unreported mortalities, but I'm still uncertain how you used this information in your analyses. Only to report underreporting rates? What are the implications for total mortality estimates and can you place total mortality estimates in the broader context of the population dynamics? Similarly, reasons for several other data collections and methods are not clearly presented. For example, it is unclear why you assessed body condition (why not use bioimpedance instead of the more subjective metrics?) and what specifically did it contribute to the study? There is no reference to body condition in the Discussion.

a. We use two established methods of estimating unreported mortality, the primary method being

through known-fate analysis of collar data (McLellan et al., 1999). The second being the

compulsory inspection method developed by (McLellan, Mowat, & Lamb, 2018). The ear tag

method is new, but follows the logic of (McLellan et al., 2018) and is intended to

provide a multiple lines of evidence approach to an admittedly difficult metric to estimate.

1. The goal of **ensemble methods** is to combine the predictions of several base estimators built with a given learning algorithm to improve generalizability / robustness over a single estimator.
2. We’ve moved most of the unreported rate methods into an appendix.
3. We’ve added reference to body condition in the methods “The collared bears killed by people had between 1-5 cm of rump fat, indicating their proximity to town and transportation corridors was not due to starvation.”

3) You compare intrinsic growth with observed growth rates to obtain an estimate of immigration rates. Why not estimate it directly from the SCR data using the open model or a robust design approach, which would provide much stronger inference. Additionally, you subsetted the genetic data to a very small study area (for grizzly bear standards) of 3210 km2 and it is unclear how well the subsetted study area matched the sampling area associated with the vital rest data you used for your calculation of the intrinsic growth rate. It is unlikely that the 2 sampling techniques match in their population inference and a key question is whether immigration rates can be reliably estimated or inferred from their difference. Also, how realistic is the assumption of stable age distribution for estimation of intrinsic rate of growth? You fit 2 types of SCR models (closed with secr and and open with openCR), however, it is unclear what portions of the results, if any, were based on the closed model estimates.

A. We do indeed estimate observed growth rates from the SCR data using an open model with a robust design approach.

1. The subset DNA area was subset expressly for the purpose to spatially match the demographics estimated from the collars.
2. The stable age distribution is realistic given that we have no indication that the population dynamics have been dramatically changing through time here. There is certainly a young age distribution (Lamb, Mowat, McLellan, Nielsen, & Boutin, 2017), but we have no evidence that this is changing through time to create an unstable age distribution.

4) You suggest that the source of immigrants is likely sustained at a broader landscape scale beyond Elk Valley. You have some direct evidence of immigration based on the 3 radio-collared subadult males, but can you provide more specific evidence based on demographic data indicating emigration from possible source areas? More importantly, what if the level of immigration you estimated (i.e., the difference between SCR results and intrinsic rate of growth) actually reflect transient animals rather than true immigrants? Your analysis would not be able to distinguish between the two (but could be addressed, see e.g., Clavel et al. (2008)). That could substantially change the interpretation of your findings and seems like an important topic to address.

1. We are unclear what “more specific evidence based on demographic data indicating emigration from possible source areas” would look like, beyond our few examples of showing bears physically emigrating from source populations into the sink area (Figure 6).
2. The 3 known immigrant animals (Figure 6) we captured and collared all set up a home range and did not display transient behaviour. This behaviour is not typical of grizzly bear populations, and the open CR models estimate the probability of animals staying vs leaving a populations and indeed we end up with an overall stable population, despite intrinsic rates from collars expecting an ~6% decline, which must mean more animals are coming in than leaving.

5) Only the first 3 paragraphs (lines 436-475) of the discussion actually stay somewhat within the inference provided by the data. Most of your discussion (lines 476-586) focused on the themes of coexistence and conflict reduction techniques. Although there is valuable information provided in these paragraphs, they are beyond the inference of the data. The result is that the manuscript reads more like a perspective on human-grizzly bear coexistence than research article addressing new research questions and hypotheses. Also largely missing from the Discussion are any caveats and limitations of the data and analyses.

1. Adding this in from comment 1: our goal here is to provide spark for action and a bit of a blueprint on what next steps would be. That is why a portion of the discussion strays from the strict data presented here and expands into our collective experience working on grizzly bear demography and human-wildlife conflict to provide actionable solutions.

Line comments:  
  
Line 59: Here, you describe a "version of coexistence that we subscribe to", which readers might interpret as the authors taking a position or being told what coexistence should be, rather than describing this in more neutral terms, e.g.:  "Importantly, coexistence does not necessarily imply the situation is always peaceful, but rather that the situation needs to be at least demographically sustainable and without excessive burdens on either party (Lamb et al. 2020)."

1. Changed as per the reviewers suggestions. We’ve also added additional citations to acknowledge that the spectrum of coexistence has been explained in detail by others before.

Line 64: You state that "In response, some grizzly bears have altered their behaviour to  
more nocturnal patterns to avoid conflicts with people and associated mortality."…however, this is not a logical extension of what you state in the previous sentence. Please rephrase this section.

1. Changed sentence to “Bears are not passive actors in the areas where people and bears overlap, and some grizzly bears have altered their behaviour to more nocturnal patterns to avoid conflicts with people and associated mortality.”

Line 69: replace "teeters" with "depends in part"

1. Done

Line 72: Replace " The southeast corner of British Columbia, Canada" with "Southeastern British Columbia, Canada"

a.

Line 74: I suggest deleting the vague term "busy"; in lines 76-77 it becomes clear what you mean.

1. Agreed, removed

Line 74: delete " perhaps unsurprisingly"

1. removed

Line 82: "hazy"? Do you mean "unresolved"?

1. yes, replaced with unresolved

Line 82: delete "Here" and start sentence with "We…

1. done

Line 82: replace "following" with "radiomonitoring"

1. done. Not sure if this is a word though?

Line 85: delete "currently"

1. done

Line 90: add hyphen: "5,073-km2 study area"

1. done

Line 99: delete "abundant"

1. done

Line 114: unclear what "often" refers to

1. it wasn’t always, and we don’t have a complete record of how many times CO’s did not call us to collar, unfortunately. But generally we collared most the bears they caught and released.

Line 124: rephrase "real time manual relocation"

1. changed to “for real time manual locating of individuals”

Line 328: "at a coal mine"

1. done

Line 385: I'm not an alpha = 0.05 proponent by any means but this is an unconventional choice of 90% CI, please justify

1. As the reviewer suggests, 95% is arbitrary, as is our decision for 90% somewhat (see here for a discussion on why some choose 89% https://easystats.github.io/bayestestR/articles/credible\_interval.html). But overall, we chose the 90% as a reasonable level of certainty/precision needed to make management decisions.

Lines 399-404: different font size

1. thanks, changed to 12

Line 441: add "to" before "the north"

1. changed to “compared to 100 km north in Banff National Park”

Line 445: replace "We show" with "Our data showed.."

1. done

Line 460-462: you stated "…essentially provides two options for a young bear: 1) learn how to avoid conflicts and stay safe near transportation corridors, or 2) likely die before adulthood." I'm not sure these options are unique to young bears, the real issue is that as young bears are trying to establish a home range, they are more likely to encounter risks (highways, railways, conflict situations) and thus have a lower survival rate.

1. We have changed the language here following R2’s comments, from “options” to “outcomes” seeing bears wouldn’t choose to die.

Line 471: I assume "us" should be "is"

1. yes, fixed. Thanks

Line 480-481: Why include Kootenay Valley in this number? Not relevant to this study focused on Elk Valley.

1. Fair enough, changed to EV

Lines 491-492: "…collisions are lose-lose situations where neither party benefits" seems like an tautology.

1. Technically this is correct, but the way it is currently phrased seems likely to sentence clear and easily understandable to readers.

Line 510: delete "ever"

1. done

Line 531: replace "doesn't" with "does not"

1. done

Line 537: To avoid prescribing what managers "should" do, I suggest you rephrase as follows: "With the goal of reducing the risk to people and property, grizzly mortality, and ultimately the reliance on immigration to sustain this population, future efforts may need to be more focused on finding ways to keep people and bears safer in the valley."

1. This is good, thanks. Replaced with the suggested text

Lines 540-543: an alternative perspective may be that with the population being sustained through immigration, reduction of mortality would potentially lead to more bears and in turn increase the number of mortalities, even if mortality rates themselves do not increase. Thus the paradox is that there may be limits to the ability to interrupt the "conflict spiral" you mention in the Abstract, in that high mortality of bears is to be expected in these human-dominated landscapes and where immigration compensates for the high mortality rates to keep the population stable over time.

1. This is possible, but 1) we don’t expect overall density would increase much, if at all, the population is already quite dense (36/1000 sq km), and 2) our expectation would be that the if in situ survival increased then so too would be age distribution to older, presumably savvy, animals.

**Reviewer: 2**  
  
Comments to the Author  
Review  
The authors investigated the demography and behavior of grizzly bears in southeastern BC, Canada. Here, grizzly bears must coexist alongside humans in densely-populated valleys. The authors deployed collars on 76 bears and monitored reproduction, behavior, and survival over a 6 year period. The authors found that human-caused mortalities were underreported and that mortalities were much higher than elsewhere in BC. The area had a stable population due to source-sink dynamics, but many young bears in particular were killed in the area through humans.

I found the paper to be interesting and believe it will provide an important contribution to the grizzly bear literature, particularly for understanding human-grizzly bear coexistence. Many of my comments are minor, though I do have several major comments that I think must be considered; some or all may be easy to address.

Major comments:  
  
Without a similar analysis for bears elsewhere, how can we know that Elk Valley has much higher human-caused mortality than elsewhere? I.e., if someone did this study in other places, would we find the same/similar higher mortalities than reported? This is alluded to in line 458-459 (“and likely elsewhere in BC”), so the main takeaways of the high mortalities and underreporting in Elk Valley should be caveated, at minimum, that this is comparing to only the reported values elsewhere. Similar research could find higher mortalities and yield fairer “apples to apples” comparisons.

1. We respectfully disagree with this critique. The line 458-459 (“and likely elsewhere in BC”) refers to reporting rates of mortality. It is well evidenced that some portion of human-caused grizzly bear mortalities go unreported despite mandatory reporting requirements. It is thus, in our opinion, correct to state that “the Compulsory Inspection data currently under-represents the severity of conflict, road, and rail mortalities in the Elk Valley and likely elsewhere in BC”. We are confident that the compulsory inspection data would not included 100% of the conflict, road, and rail mortalities wherever you look in BC (for areas that have those sources of conflict). However, to temper our assertion we do have the soft wording of “likely elsewhere in BC”, which we think appropriately caveats that we don’t know this as a matter of fact.
2. If the reviewer is referring to our comparison of survival across published studies, we agree that we have only identified the lowest subadult survival across published studies, which we made clear in the subtitle (which was now been removed based on R1 request to increase figure size) but will make it clear in the caption and text.

Were collars deployed evenly in areas of human or road densities versus the broader study area? E.g., if put on bears closer to humans or roads, then we might expect greater mortalities for these bears. Trapping efforts generally yield more road-proximal bears (as evidenced in the figures), so it seems this could lead to difficult interpretations of the causes of mortality for the broader population and % unreported mortalities.

1. Everywhere in the study area has non-zero road density and is generally road accessible at least at the watershed scale. We have added building density to the study area map to give readers a better idea where settlement is concentrated. We acknowledge in the text that “Our capture effort was primarily directed toward the valley bottom and tributaries of the Elk Valley and therefore our inference primarily pertains to the areas that correspond to the clusters of telemetry locations (Figure 1).”

The confidence intervals for the unreported mortalities are very large. E.g., the CI ratio method yields an estimate of 0.64 with 90% CI of 0.0-0.9. It would be good to make this clear, that the inferences are difficult to obtain and confidence is low for the total % or # of likely unreported mortalities.

1. We agree. We have now added the following after we report the rates in the results “Overall, each method generally suggested many mortalities go unreported, and the median rates were similar between methods, but confidence intervals were large.”

Relatedly, in general, the unreported mortality calculations are at least for me (not someone who normally thinks about population estimation like this) challenging to think through. I wonder if this could be more simply stated in the methods? Also, are these calculations really needed if the population estimates can provide total mortalities estimated? If we know X # are collared, this should mean that the remainder are unreported, no? Overall, I’m least comfortable with this section of the paper about unreported mortalities and while that may be due to unfamiliarity with these calculation methods, I won’t be the only reader in these shoes. Whatever you can do to simplify or head off these difficulties in interpretation and questions about inferences would be helpful.

1. We agree. To address this (and length concerns from the editor) we have moved most of these methods to an appendix and included a simpler paragraph in the methods. Most readers will not be interested in the methods used, but for those that want to get into the details they will be there in the appendix.

Importantly, the confidence interval for lambda without immigration included 1.0 (0.86-1.01). Thus the inferences throughout should be sure to make clear that while it is very likely that immigration is supporting the population, there is still uncertainty here; the population might be self sustaining.

1. This is a fair point. We have quantitative assess this certainty in the results via “with 93% of bootstrapped estimates <1”. We have added wording in the discussion that caveats our certainty (likely would decline), and also added the estimates explicitly for readers to see themselves: “The low intrinsic population growth rate suggested bear density in the lower Elk Valley would likely decrease by 7% a year without immigration. Without being buoyed by immigration, the bears that spend time in the lower Elk valley bottom would likely decline (population growth=0.94 [90% CI: 0.86-1.01], Figure 6A and B).”

Minor comments:  
  
Line 29: “the species range contracted by 53%”: it may be worth pointing out that range contraction was particularly strong in the continental US (grizzlies were in only 2% of their former range by the 1970s), meaning Canada is the stronghold for NA grizzlies.

1. Good point, added in the following “By the 1970’s grizzly bears only occupied 2% of their former range in the continental USA, leaving western Canada and the state of Alaska as the strongholds for the species in North America.”

Line 48: “since the animals last walked there a century ago”: technically they walked in the GYE throughout the past century since they weren’t extirpated here.

1. Fair, but many of these areas the bears are expanding into haven’t had grizzly bears in a century or so, correct?

Line 54: missing the word “on” (focused on)

1. Thanks, added

Line 176: “n=4”: what does this represent? The # of females with >1 litter during the study?

a.yes, expanded the sentence to be more clear: : We were not able to calculate birth intervals due to a small sample size of females with multiple litters monitored (n=4).”

Line 188-189: why is this parameter difficult to estimate in other systems? Perhaps clarify or omit.

1. Clarified as follows: “By calculating the difference between observed and intrinsic growth rates, immigration rates can be directly estimated; a demographic parameter that is generally challenging to estimate given the relative rarity of dispersal events, the difficulty of collaring young dispersing animals, and the broad spatial extent of sampling that would be required to sample region dispersers could be coming from”

Line 200: “but not additional area”: this statement is confusing; necessary?

1. Agreed, removed.

Line 202-203: why would the periphery bears experience “less risk”? (due to distance from humans, right? clarify)

a.Yes, added “due to being further from people.” To the end of this sentence

Line 239: previously in this paragraph, it states that it is expected that all mortalities by COS are reported. If true, how is COSci different from COS in the formula? Are these the same thing? If so, should the term be replicated in each instance instead of separated as different terms?

1. They are different because there are uncollared bears that are killed by the COS in the CI data

Line 241: “plus HCci" or “minus”? Looks like the latter from the equation below. If correct as written, put this equation immediately after its citation in the text?

1. Plus is correct. This is a second step after eq 1 to get the rate, but it’s a simple equation so we just included it as text. To reduce confusion we have moved the sentence “To get an underreporting rate, we divided *HCunreported* by the sum of *HCunreported* plus *HCci*.” Below Eq 1.

Line 258: are ear tags ever lost through falling or tearing out? If so, what would this do to the estimates?

1. No, we’ve never had an animal lose both its ear tags. If they were lost, this would bias the estimate to more unreported than truth, due to even fewer tags being recovered than we would expect. We do not expect this to be an issue given that we have not had issues with tags ripping out on the 40+ bears we’ve recaptured. We typically use small black button tags, one in each ear, that aren’t prone to snagging or being ripped out.

Line 274: this equation would perhaps be better moved up a few lines to where it is described on line 270-272.

1. done

Equations, generally: why are some defined as formal equations and others in text only? E.g., line 272-273 describes the underreporting calculations but isn’t included as a formal equation. Also, it’s difficult to keep track of all the codes used in these equations. Could plain text of each be used instead, or subscripts with fuller definitions for each item (e.g., TRrep could be T#-ear tagged dead with everything after “T” a subscript).

1. We were trying to simplify things by having fewer equations. The equations in text are basically just those used to get the reporting rate (i.e., observed #/expected #).

Line 363: easier to read if omit “an not bear mortalities”  (just say “ confirmed to be simple collar failures had also stopped working…”)

a.done

Line 396: missing word at “stable 2006-2021”

1. Changed to “has been stable from 2006 to 2021”

Line 400: “or 103 individuals” doesn’t follow the preceding part of the sentence (“The density of…”); add something like “with an estimated population of 103 individuals”.

1. Agreed, changed to “with an estimated population of 103 individuals”.

Line 415: Is there any reason to expect reporting rates might differ in different areas? Might help to address this assumption.

1. We’ve added the following: “Highway contractors and railway companies across the province are required to report all road or rail mortalities, thus we do not expect reporting compliance to explain this difference.”

Line 420: can you separate the road vs rail collisions here? It might be expected too that these mortalities would be more likely to go unreported if the driver/conductor couldn’t tell what they hit. If true, how would this affect estimates?  
Generally: are bear mortalities unreported in part perhaps because of fear of legal consequences? It might be helpful to note this and suggest changes that would allow reporting without retribution or to change messaging so folks know the importance of reporting and what they could expect, legally, after doing so.

1. Added the following: “The unreported mortalities were from road or rail collisions (n=4, 3 from road, 1 from rail or road),”
2. The reporting is mandatory for railway companies if they hit any animal, regardless of whether they know the species. Drivers on the highway are not required to report, but each highway has a highway contractor who picks up roadkill and its mandatory for them to report all roadkill. Most the unreporting occurs because the animal dies off the right of way in the bush. We’ve added the following to address this “The cause for unreported mortalities can be unique to each instance, but in general road or rail collisions were not reported because the animal was struck but did not die on the road/rail but was found dead via the collar 20-400 meters away in dense vegetation”

Line 445: this “40% mortality” should include the CI since the “up to” is for the estimate but the actual values could be lower or higher than this.

1. Added CI’s and changed “young” to “subadult” to be more specific “Our data show that subadult grizzly bears in the Elk Valley are surviving poorly, with up to 40% (90% CI: 18-62) annual mortality”

Line 450: “people caused most mortalities” should note that this is for known cause of death from collared bears. Also would be good to include the total N for each COD in the subsequent part of this sentence.

1. “The known cause of death from collars was consistent with other studies, with people causing most mortalities (93%, 13/14).”

Line 461: I wouldn’t say this is an “option” so much as an “outcome”. Bears wouldn’t opt to die.

1. Agreed, changed to outcome: “The stark discrepancy in survival between subadults and adults in the Elk Valley highlights the intense demographic filter (sensu Ford et al. 2017) that essentially provides two outcomes for a young bear: 1) learn how to avoid conflicts and stay safe near transportation corridors, or 2) likely die before adulthood.”

Line 465: here too, a CI would be helpful since the estimate did include 1.01 at the upper end, meaning the population actually could be stable.

1. Added CI’s and softened language to include “would likely”: “Without being buoyed by immigration, the bears that spend time in the lower Elk valley bottom would likely decline (population growth=0.94 (90% CI: 0.86-1.01), Figure 6A and B).”

Line 471: “is” not “us”

1. changed

Line 490: add the total N here for # collisions so readers don’t have to look it up elsewhere in the paper.

1. Added “ Just under half (6 of 14) of the known-cause mortalities were due to collisions.”

Line 519: how would one “ensure high survival of resident adult females”? Clarify.

1. Added some more detail on how, which we get into more detail in the end of discussion “We thus expect conflicts in the Elk Valley could be reduced by adopting conflict reduction strategies that reduces the mortality of resident subadults and ensures high survival of resident adult female bears who know how to coexist and can continue teaching their offspring these habitats.”

Paragraph starting line 540: some of the suggestions here seem disjunct from the findings of the study, e.g., given the repeated mention of vehicle/train strikes (which bear spray, e.g., won’t help, of course). Perhaps good to motivate this paragraph with the % of mortalities from direct human-bear interactions (not in vehicles) that lead to death for bears, again so that readers don’t have to look around for this number and so they can see why this paragraph is helpful based on the results of the study.

1. Agreed, added “Nearly half of the known-cause mortalities (6 of 14) were due to direct conflicts between people and bears.”

Figure 1: the white line is very difficult to see; suggest thickening the line. Also, the inset map doesn’t technically show the southern range of grizzlies in NA, as WY is cut out. Coal mines could be a different color than black (or roads not black) because at first glance, this appeared to be a high density of roads. It may be useful to put information on human densities or building densities on this map too (e.g., from Microsoft buildings dataset if it includes CA) to help readers appreciate where humans are on this landscape (beyond the highway lines and city centers). Also, part of this map includes AB, but the paper discusses BC; I can’t tell from the white line if this overlaps AB but if it does, it would perhaps be good to acknowledge these inferences are from the edge of BC/AB rather than only really discuss BC.

1. Agreed on white line, that was an error. The `ggplot` package in R recently updated and the linewidth argument changed. This has now been fixed.
2. Added in WY.
3. We’ve left coal mines and black polygons and highways as black lines as its unlikely that a highway would be dense like the mines.
4. We’ve acknowledged the study area paragraph that eastern edge of the study area extends about 7 km into Alberta.
5. Added building density from Microsoft

Figure 2: The white lines in these figures don’t appear much at all either, and isn’t defined in the caption or legend. I also am not sure C and D are really needed here; perhaps save for appendix and enlarge map B in particular?

1. Agreed on white line, that was an error. The `ggplot` package in R recently updated and the linewidth argument changed. This has now been fixed.
2. Increased text size so C and D were more interoperable.

Figure 4 and in general: would it be helpful to discuss the conflict reporting rate per human population size too? It isn’t surprising if rates are higher where there are more people, so rate per 10k sqkm isn’t necessarily as helpful. Also, with these repeated maps here and previously it may be more useful to put them into one large map with a detailed legend (including the cities and highways for reference; cities are included here but not described in a legend or caption).

1. Certainly to a point human population size increases chance of conflict, but it’s not as simple as a linear relationship. For example, most often its curvilinear where conflict increases with more people on the landscape, but only to a point, and then starts to decline as bears avoid the area completely or are extirpated from the area (Merkle, Krausman, Decesare, & Jonkel, 2011). But beyond that, our interest here is not where is the worst place to be a person (i.e., bear conflict rates per capita), we are looking to identify the portions of the province that wildlife managers ought to focus attention on, thus we want to identify the gross conflict density.
2. Agreed on the multiple maps and them being small. The idea is that Fig 1 provides the larger and more detailed map, and support these smaller maps. We tried combining the maps previously but didn’t find that the larger size was a sufficient trade off for the more cluttered map that created more difficult interpretation.
3. Text size increased

Figure 5: These are small and difficult to see; they are one of the main results and should be larger (perhaps without the added subtitles; save these for the caption). For C, the point estimate is lowest in Elk Valley but CIs show this may not be true; be sure to make this uncertainty clear throughout discussion of this point. Also, be sure to correct “Cis” in caption to “CI” (autocorrect error).

* 1. Agreed, labels increased and subtitles removed

Figure 6: C is confusing to interpret; how to clarify? The shading is strange (fading means what?) and the comparison of DNA to collar projections is flat for DNA but declining for collars; why would DNA go flat in the future?

* 1. Clarified in caption as follows “C) Abundance of grizzly bears in the Elk Valley estimated from genetic spatial capture-recapture analysis *(DNA)* between 2016 and 2021 and predicted from collar-based intrinsic population growth rate from *(*B*, Collar*). *P*opulation trends *were projected out to* 2040 *for the total population (DNA) using the 2016-2021 growth rate from the open s*patial capture-recapture *model,* and *for a simulated population without* *immigration (Collar).”*

Table 1: perhaps change “monitored” to “collared” to help readers understand what this is. What does the value in the parentheses here represent?

* 1. Changed to “Collared mortalities (unreported)”.

Table 2: I’m not sure how helpful this column for “excess” is. There isn’t reason to expect equal shares of mortalities across BC when human population, road, and rail densities differ strongly.

1. Yes and no. Obviously the places with bears that have no people or transportation have lower mortality, so we agree that this is an obvious conclusion. But there are multiple areas where people, transportation infrastructure, and grizzly bear overlap within the Province. Despite a number of areas with overlap (almost the whole Kootenays, Chilcotins, central BC, mid to upper coast, etc), the small area within the Elk Valley has almost half the railway collisions in the whole Province. It’s not a perfect stat, but we think it’s helpful to guide wildlife managers to understand the relative impact they could have if they were to acted in this relatively small area. Reducing road, rail, or human-bear related mortalities in this portion of BC that makes up <1% of the grizzly bear range in BC could chip away at 33, 42, and 7% of the provincial bear mortality from these sources, respectively.

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