

Peer Review Report

Reviewer 5

Species Status Assessment for the Grizzly Bear
(*Ursus arctos horribilis*)
In the Lower 48 States:
A Biological Report

U.S. Fish and Wildlife Service
Grizzly Bear Recovery Office
Missoula, Montana

Version 1.0 – July 7, 2020

Reviewer 5

Peer Review of the Draft Species Status Assessment for the Grizzly Bear (*Ursus arctos horribilis*) in the Lower-48 States: A Biological Report.

GENERAL COMMENTS

Thank you for the opportunity to review *Species Status Assessment for the Grizzly Bear (Ursus arctos horribilis) in the Lower-48 States: A Biological Report*, Version 1.0, July 2020. I have completed my assessment of the document and am impressed with the overall quality of presentation and the level of detail included. There are some important topics which, in my opinion, need attention including: 1) more discussion and explanation of population estimation techniques and how the data are presented and used; 2) inclusion of data and discussion of bear-caused human casualties (maulings and fatalities) and instances of bear depredation on livestock; 3) a more thorough review of vegetation management and anthropogenic developments; and, 4) a more comprehensive discussion of the social aspects affecting the determination where bears will be tolerated and at what density levels. Addressing these topics will make the document more comprehensive and useful to readers and decision-makers. I also offer technical suggestions as well as some editorial comments. My recommendations and critiques are presented below in a split format; first with point-by-point responses to the “general comments on the biological report” questions, and second with page-specific comments. All are intended to be constructive and not critical, and I would be happy to discuss them with the authors any time they wish.

1. Is the Biological Report’s description and analysis of the species’ needs, biology, habitat, population trends, and historic and current distribution accurate and, if not, what information is missing and how is it relevant?

Grizzly bears are generalists who can and do utilize a wide variety of habitats and food sources. Their adaptability to various situations is the primary reason they have circumpolar distribution and live in habitats as diverse as the Gobi Desert, arctic tundra, northern rainforests, and the prairies. The authors make this point several times in the document, and they also give site specific information on what bears use and how they are doing in each of the highlighted ecosystems. This information initially presented in Chapter 2 and is presented in more detail later in the document. It would benefit the reader if Chapter 2 would reference other sections where more detail information can be found.

The term “home range” is initially presented in Chapter 2 (Pages 45 and 59) and used several times in the document. This is a very important concept and is used in analyses and decision-making, yet it is never described in detail. Because of this, it needs to be defined and analytical methods determining it justified throughout this section. While Minimum Convex Polygon depictions are most intuitive and easiest for the public to understand, more robust analyses are usually used in current literature. The authors should explain which method(s) they are referring to and why they chose it (them), and include details such as sample size, range, and standard deviations or confidence intervals where appropriate.

Similarly, population data are presented throughout the document and are an integral component to analyses and decision making. Although the various methods used are named and cited on Page 56 and in slightly more detail in Appendix A, there needs to be a much more thorough discussion

of the pros and cons of each (perhaps a comparison table), and the inherent biases and relative confidence intervals associated with each method. This section is critical to every aspect of the report and will be an Achilles heel if not presented in an objective, transparent and comprehensive manner. For instance, on Page 156 there is indication that the Chao2 method underestimates a population by 30-40%. Do the other methods offer similar degrees of accuracy? Are there any areas where two or more methods were compared simultaneously? If so, what are the results? Finally, each time a population estimate is presented, it should be associated with a confidence interval.

It is unclear, throughout most of the document, whether the authors are including all bears (including dependent cubs) or only independent bears (excluding cubs) when they present a population estimate. This is a significant difference, because in many cases it can result in a difference of >30%. Similarly, it is unclear if mortality data refer to all bears or only independent bears. Either way can be justified, it just needs to be noted what they are referring to and why they chose that metric.

A notable omission in the discussion of habitat requirements is the availability of water (Page 88).

2. Does the Biological Report provide adequate review and analysis of the factors relating to the overall viability of grizzly bears in the lower-48 States (e.g., demographics, habitat, disease and predation, and genetics) and, if not, what information is missing and how is it relevant?

The authors of this Species Status Assessment make it clear from the onset that their analysis is based on the conservation biology principles of the “3Rs” - “Resiliency” (ability to sustain environmental and demographic stochastic events), “Redundancy” (ability to sustain catastrophic events), and “Representation” (ability to adapt to changes in the environment). While this concept may be new to most readers, they do a good job of presenting it and reiterating it within pertinent parts of the document.

Demographic concerns and recommendations are addressed in Question #1.

Habitats available to bears in each of the ecosystems are thoroughly presented and well referenced with literature citations. The concept that bear habitat must include certain acreages and distances from roads is more a factor of human tolerance than it is a factor of what bears can use to fulfill their basic biological needs in many cases (see my comments on Question #5). For instance, bear populations thrive throughout Alaska, not just in unsettled areas (Page 60), including most of the major cities in the State. Even with this in mind, it is still appropriate to practically limit potential bear habitat in the lower-48 states as is presented in the report, but it would be more accurate to acknowledge the human tolerance aspects of those limitations.

Disease prevalence within bear populations and discovered in individual bears is well presented. I recommend addition of a paragraph on the potential of disease and parasite transmission from bears to other animals (e.g. brucellosis to cattle, tapeworm to canids, infections, and trichinosis to humans).

Predation on bears by other bears seems to be dismissed for the most part, but it is a well-documented factor in coastal Alaska brown bear populations (contrary to what is mentioned on Page 153) and may be a factor when bears reach certain densities.

Genetic research and literature are presented in a comprehensive manner, but there is some inconsistency in the interpretation of how many bears are necessary for a genetically viable population. While one paper cited notes that at least 400 animals are needed (Page 55) there are exceptions described later (Page 158), and acknowledgement that most of the ecosystems discussed have populations much lower than that number, yet they are projected to be viable. This could be clarified so that it is better understood by the general public. It should also be noted that although there may be evident fitness of a population with low genetic diversity, there could be other factors that need to be considered (see comment on Page 158).

3. Does the Biological Report provide accurate and adequate review and analysis of the current and projected future condition of the species? If not, what information is missing and how is it relevant?

Current and future conditions are thoroughly discussed for GYE and NCDE, but the other areas often lack the same level of detail and are not even mentioned in some cases. I recognize that this is probably a result of less research and lower priorities for grizzlies in these areas, but for consistency it would be beneficial to make sure each area is addressed for all circumstances, even if it's just to note there are no data available (see page specific comments for details).

While population augmentation through translocation is considered a viable management tool in some ecosystems, it is not considered for BE except in the most optimistic scenario. If the goal of fulfilling the "3Rs" is critical to the success of the species, it should be clarified why there is not an aggressive program to reintroduce bears into this area. If the primary reasons are political and societal, that should be mentioned and discussed.

4. Does the Biological Report provide adequate review and analysis of stressors and other influences on grizzly bears in the lower-48 States? If not, what information is missing and how is it relevant?

Most obvious stressors and other influences on grizzlies are discussed within the document; however, there is room for improvement in the following sections:

- Developed areas. Throughout this section (Page 107), discuss the intensity of use. For instance, how are bears influenced by high intensity sites (e.g. hotels and visitor centers) versus low intensity sites (e.g. remote rental cabins). How many concentrated sites are there in each area versus dispersed sites?
- Vegetative management. Include discussion of the following (Page 120):
 - Impacts of grazing on vegetation (cattle and sheep)
 - Fire management policies (let burn, limited suppression, aggressive suppression)
 - Recreational and commercial berry pickers

- Agricultural development on private lands within and adjacent to recovery zones
- Livestock. It would be informative to include the total acreage and percent of bear habitat encompassed within the allotments noted. It would also be helpful to note if any of those areas are strictly livestock wintering areas that have little impact on bears (Page 110). If there are any positive impacts of livestock on grizzly individuals or populations, such as bears feeding at remote livestock carrion dumps, it should be noted here. If not, consider including a statement like, “Although there may be positive impacts for individual bears as they acquire high caloric food by depredating or scavenging livestock, these advantages are rarely realized by the population because those bears are usually removed by management action”. Additionally, it might be appropriate to list apiaries in this section on livestock since bears are attracted to and depredate beehives.
- Roads and railroads. Include a description or map of the major roads and railroads that are within and adjacent to each area and the level of traffic on each (Page 99).
- Mineral and energy extraction. It would be beneficial to include a brief discussion of how different mineral and energy developments impact bears and their habitat (e.g. fracking, drilling, exploration, hard-rock mining, phosphate mining, gravel extraction) (Page 114).
- Bear-caused livestock and crop depredation. Documentation of the number of depredation claims per year and locations would give the reader an idea of how prevalent these occurrences are and their impact on the bear population (Page 147). Describe what actions are taken in areas with chronic problems.
- Bear-caused human casualties. A section on human maulings and fatalities, including how many, what were the circumstances, where did they occur, what management actions were taken, what are the trends, and what mitigation/education programs were enacted would give the reader an idea of how prevalent these occurrences are and their impact on the bear population. Although such occurrences may have minimal direct impact on the bear population, the indirect impacts can be significant as they can lower people’s tolerance level for bears living nearby.

5. Are there any significant oversights, omissions, or inconsistencies in the Biological Report?

Now that grizzlies in the lower-48 states are doing much better than they did 40 years ago, their fate is arguably hinged more on human-acceptance than it is on habitat, genetics, or food resources. The risks versus benefits to human society will dictate how the bears do in the future. Risks include direct conflicts (e.g. human fatalities and maulings, cattle and crop depredation, collisions) and indirect conflicts (e.g. restrictions on human uses, fear to go into areas where bears may be present). Benefits can also be direct (e.g. improved quality and integrity of the ecosystem, observing bears, adherence to federal law) and indirect (e.g. enhanced wilderness character, “just knowing they are out there”). While the report touches on these subjects in Chapter 3 (Regulatory History) and Chapter 5 (Page 144 - Preventative measures and I&E programs), it needs to be more thoroughly discussed. Page-specific comments below offer some suggestions on how this might be done. While it may be beyond the scope of this report to delve too deeply into these subjects, the fact remains that it is a major factor in where bears will be tolerated and allowed to expand, so it should be acknowledged and discussed as much as appropriate.

Connectivity with grizzly populations in Canada is discussed in various places in the document, but there is an inconsistent treatment of the subject. Each ecosystem, with the possible exception of GYE and BE, probably has some exchange with bears on the Canadian side of the border and this could have important ramifications to the “3Rs” of those ecosystems, yet SE is the only area where this is considered a factor.

6. Are the statements about current and future condition logical and supported by the evidence provided?

Logical and conventional choices are presented for various future scenarios, and each are well presented.

As noted in Question #5, human societal factors are pivotal components to the persistence of grizzlies in areas where they are currently and expansion into areas of suitable habitat. Much of the underlying theme in Chapter 3 (Regulations) is the on-going controversy of whether the species should be listed or managed as a game animal or a predator, and “how much is enough”. These are politically and emotionally charged subjects that are decided by the courts and the “court-of-public-opinion” and it is difficult to judge what the authors and their agency are comfortable with including in this document. With that in mind, I think it would be beneficial to include an objective discussion of the subject when prognosticating potential future conditions.

7. Does the Biological Report include all the necessary and pertinent literature to support our assumptions/arguments/conclusions?

Statements and conclusions throughout the document are well supported by pertinent and current literature sources. A few suggestions noted in the page-specific comments below, including: need for a citation on the diet of subadults (Page 43), addition of a citation that discusses the genetics of Kodiak brown bears (Page 158), and a question on the appropriateness of a citation about denning (Page 296).

My most significant concern is the availability of the cited literature sources to the general public and decision-makers who want to take the time to look something up and understand it better. As presented now, unless a person has access to a commercial service such as JSTOR and the time and ability to contact various agencies for reports, they cannot find what the authors are referring to. I would like to see a central repository for all of the literature cited in this document. A web-based portal would solve this problem and enhance transparency and the public’s understanding of the logic behind discussions.

8. Are there demonstrable errors of fact or interpretation? Please provide the specifics regarding those particular concerns.

Other than technical comments noted elsewhere, I found no demonstrable errors in fact or interpretation.

9. Additional general comments.

Because this document was a collaborative effort, written by several authors, it would benefit from some editorial wordsmithing to smooth out differences in style, level of detail and points-of-view (first person vs third person).

Tables need to be able to stand-alone. Perhaps the most flagrant example is on Page 93 - Figure 2 (should be Figure “20”). There is no explanation of the significance of the red and green arrows and the yellow dotted lines, and no explanation of why “adult female survival” and “large blocks of land” are outlined in purple. A reader should not have to refer to Figure 19 to determine what “F, S, B, and D” mean. All-in-all, this figure is difficult to decipher without a lot of concentration and time.

In summary, this document was informative and enjoyable to review. I compliment the authors and editors, as well as the myriad researchers and managers, responsible for putting it together and providing documentation of the success story of bringing grizzly bears back from the brink of extirpation in the lower-48 states. Hopefully the public and decision-makers who read this document will use it to find common ground and assure a bright future for these bears and the people who share their habitat.

SPECIFIC COMMENTS

Page 8 – Figure 1- indicate what the colored arrows represent; figures should be able to stand alone.

Page 13 – address the two statements “Error! Reference source not found”.

Pages 21 and 22 – Table 3 includes detailed descriptions but Table 4 does not.

Page 31 – Include a definition of “DPS” acronym (see page 71).

Page 43 – Paragraph 3 – “... subadults disperse away from their mother and establish their own home ranges...” this statement is contradicted on Page 45, Paragraph 4 where is states “Young female grizzly bears establish home ranges within or overlapping their mothers”.

Page 45 – “home range” needs to be defined and analytical methods determining it justified throughout this section. While Minimum Convex Polygon depictions are most intuitive and easiest to understand by the public, more robust analyses are usually used in current literature. Which method is referred to and why?

Page 48 – Table 6 – arguably, age of first successful litter weaned is a more meaningful metric than age of first reproduction.

Page 50 – Paragraph 1 – “Most beds were found less than a yard or two...” use metric units followed by US customary units to be consistent with rest of document.

Page 51 – it would be appropriate to include a paragraph or two about other anthropogenic food sources such as apiaries, granaries, livestock carrion dumps, other garbage and dumps, agricultural crops.

Page 53 – Paragraph 3 – Is it appropriate to assume that prairie habitats are no longer “biologically” suitable for grizzlies, or are they now less suitable for them because of habitat alteration and human tolerance levels? I suspect that as adaptable as grizzlies are, they could make a living in the modern prairie if humans allowed it.

Page 55 – Paragraph 2 – “A total population size of approximately 400 animals is needed for short-term fitness...”, while this may be what was stated in this publication, it is not the case in all situations as noted for Kodiak on Page 158. Perhaps inclusion of a qualifier such as “...is *usually considered* needed...” would make this a more accurate statement.

Page 56 – Population Trends and Estimates – Although the various methods used are named and cited here and in slightly more detail in Appendix A, there needs to be a much more thorough discussion of the pros and cons of each (perhaps a comparison table), and the inherent biases and relative confidence intervals associated with each method. This section is critical to every aspect of this report and will be an Achilles heel if not presented in an objective, transparent and comprehensive manner. For instance, on Page 156 there is indication that the Chao2 method underestimates a population by 30-40%. Are the other methods similarly accurate? Are there any areas where you compared two or more methods simultaneously? If so, what are the results?

Page 59 – Paragraph 2 – Similar concerns about home range as noted earlier. How are these home ranges calculated to determine a life-time home range? How many years must a bear be followed before it is considered to have enough data for a life-time home range? Are its relocations as a dependent cub included in its life-time home range?

Page 60 – Paragraph 2 – bear populations thrive **THROUGHOUT** Alaska, not just in unsettled areas. Most of our major cities have brown bears doing quite well in and around them.

Page 60 – Paragraph 4 – Total number of bears – here and in several other places you refer to the total number of bears without defining what this means. Are you including all bears, or just independent bears? What are the ranges and confidence intervals for the estimates you provide?

Page 66-68 – You provide 1975 estimates for GYE and NCDE, but not for the other ecosystems. To be consistent you should provide estimates for the other areas or explain why they are lacking.

Page 66 – Figure 16 – it would be beneficial if the map contained a little more detail such as major drainages, roads, and communities.

Page 71 – What does the acronym “DPS” mean? This should be included in text or in the list of acronyms on Page 31.

Page 83 – Table 10 - it would help to include percentages of total population along with the total annual human-caused mortalities.

Page 84 – Include a more detailed explanation of why bears that live or move back and forth from Canada are included in the SE discussions but not for the other populations that are along or near to the border.

Page 85 – Either here or somewhere else in the document, include a more detailed explanation of why translocations to BE are not being considered (except in the most optimistic future scenario).

Page 88 – Paragraph 1 – include access to water as a basic habitat factor

Page 89 – Dens and Cover– either expand the explanation of denning habitat and cover or refer the reader to sections in the document where they can learn more about it. It would be good for the reader to know that each of these factors can be diverse depending on where the bear lives.

Page 93- Figure 2 – should be Figure “20”. As noted with other figures, this should be a stand-alone page with an explanation of what the red and green arrows and the yellow dotted lines mean. There should also be an explanation of why “adult female survival” and “large blocks of land” are outlined in purple. A reader should not have to refer to Figure 19 to determine what “F, S, B, and D” mean. All-in-all, this figure is difficult to decipher without a lot of concentration and time.

Page 99 – include a description or map of the major roads and railroads that are within and adjacent to each area and the level of traffic on each.

Page 107 – Throughout this section on developed sites, discuss the intensity of use. For instance, how are bears influenced by high intensity sites (e.g. hotels and visitor centers) versus low intensity sites (e.g. remote rental cabins). How many concentrated sites are there in each area versus dispersed sites?

Page 108 – in the GYE section you refer to 1998 data for comparison - are there comparable data for the other ecosystems?

Page 110 – Paragraph 1 – Are there any positive impacts of livestock on grizzly individuals or populations, for instance remote livestock carrion dumps? If not, consider including a statement like, “Although there may be positive impacts for individual bears as they acquire high caloric food by depredating or scavenging livestock, these advantages are rarely realized by the population because those bears are usually removed by management action”.

Page 110 – Paragraph 2 – Are there any concerns about disease transmission to/from bears and livestock?

Page 110 – Paragraph 2 – would it be appropriate to list apiaries as livestock since bears are attracted to and depredate beehives?

Page 110 – Paragraph 3 – here and in each of the other ecosystem sections, it would be informative to include the total acreage and percent of bear habitat encompassed within the allotments noted. It would also be helpful to note if any of those areas are strictly livestock wintering areas that have little impact on bears.

Page 111 – how many allotments (acreages) are there in the CYE, SE, BE, and North Cascades?

Page 114 – include a brief discussion of how different mineral and energy developments impact on bears and their habitat (e.g. fracking, drilling, exploration, hard-rock mining, phosphate mining, gravel extraction).

Page 116 – how many mineral and energy developments are in CYE, SE, BE and North Cascades?

Page 120 – Important vegetation management aspects that need to be discussed include:

- Impacts of grazing (cattle and sheep)
- Fire management policies (let burn, limited suppression, aggressive suppression)
- Recreational and commercial berry pickers
- Agricultural development on private lands within recovery zones

Page 131 – add “cub abandonment” to the list of mortality-related effects of research.

Page 132 – should acknowledge the potential bias associated with reporting the percentage of deaths that are caused by humans. We know much more about human-caused mortalities than all other mortalities because they are easier to discover. Do you have data on the fate of radio-collared bears for a less bias determination of anthropogenic versus other-caused mortalities?

Page 134 – Table 2 – “**” in the foot notes – does this include bears that were moved to research facilities or zoos as well?

Page 135 – Paragraph 2 – how many grizzlies have been removed from the wild and stayed within the lower-48 states for commercial, scientific, or educational purposes?

Page 139 – Paragraph 2 – were any dependent cubs associated with the research-related mortalities noted here? If so, how are they recorded?

Page 139 – Paragraph 3 – “in 2003” is repeated twice in the same sentence.

Page 140 – Paragraph 1 – include the numbers for capture mortalities, not just the percentage.

Page 140 – Paragraph 1 – “... this type of accidental mortality is rare...” – define what you mean by “rare” when referring to intraspecific mortality during capture operations.

Page 143 – Paragraph 4 – “Defense of life killings are currently allowed...” as written, this suggests that there was a time they were not allowed or that there is consideration to criminalize them in the future. Is that the case?

Page 144 – need a section on human maulings and fatalities, including how many, what were the circumstances, where did they occur, what management actions were taken, what are the trends, and what mitigation/education programs were enacted. Although such occurrences may have minimal direct impact on the bear population, the indirect impacts can be significant.

Page 144 – Preventative measures and I&E programs – these sections start to address the importance of human responses and tolerance in the success of grizzly population sustainability; however, this subject is a major element that needs to be thoroughly discussed. The only way grizzlies can persist in areas where they are currently and expand into areas of suitable habitat is if people allow them to – biology is only a component of that success, not the sole driving factor. Along those same lines, and perhaps beyond the scope of this document, is finding ways to determine “how much is enough”, in other words, is there a way to define success in reestablishing this species?

Page 147 – need to document the number of depredation claims per year and locations. Describe what actions are taken in areas with chronic problems. This section suggests that all depredation claims are paid by state governments, is that correct?

Page 148 – Paragraph 4 – distinguish between hazing (scaring bears) versus aversive conditioning (teaching bears). Summarize the cited 2020 report in a paragraph or two including such things as techniques, who authorizes and carries out the actions, and how they are documented and evaluated.

Page 149 – Mortality – throughout this section clarify if the data presented include all bears or just independent bears.

Page 150 – Paragraph 3 - either summarize or define “demographic recovery criterion #3”.

Page 152 – mortality limits are laid out for GYE and NCDE, but not the other areas – either include limits for these other areas or explain why.

Page 152 – legal hunting – “...1975-1991...hunting accounted for 50% of human-caused mortality”, this is probably biased reporting because hunters were compelled to report, but illegal kills were not and there was not as much of a social stigma associated with hiding a grizzly kill as there is now. This sentence would be more accurate with inclusion of a qualifier such as “...hunting accounted for 50% of the reported human-caused mortality...”. Additionally, it would be informative to have a brief discussion of whether a carefully regulated hunt would be additive or compensatory mortality.

Page 153 – Paragraph 4 – while intraspecific predation may be “rare” for grizzlies in the lower-48 states, it is well documented and not uncommon amongst bear populations in coastal Alaska.

Page 156 – Paragraph 3 – if Chao2 analyses result in undercounts of 30-40% as suggested here, it has major implications on your population estimates and projections and should be highlighted rather than buried midway in the document.

Page 158 – Paragraph 2 – although bears on the Kodiak archipelago have been genetically isolated for about 10,000 years and they appear to be a healthy and robust population currently, genetic analyses suggested the possibility that “..the populations on the Kodiak Archipelago may have a smaller chance at mounting immune responses against pathogens over the long term, given the low variability at the MHC [major histocompatibility complex] class II DQB1 exon 2 gene.” (Talbot et al, 2006; p.29).

Talbot, S.L., J.R. Gust, G.K. Sage, A. Fischbach, K. Amstrup, W. Leacock, and L. Van Daele. 2006. Genetic Characterization of Brown Bears of the Kodiak Archipelago. Final Report to Kodiak National Wildlife Refuge, US Fish and Wildlife Service, Kodiak, Alaska 99615. 87 pp.

This publication can be accessed at: <https://www.arlis.org/docs/vol1/69123188.pdf>

Page 158 – Paragraph 2 – “van Daele” should be “Van Daele”.

Page 158 – Paragraph 3 – “...Kodiak brown bears (approximately 2,000 individuals)...” – Van Daele and Barnes 2010 (Table 6) reported that the 2005 population estimate for the Kodiak archipelago was 2,378 (± 519) independent bears and 3,526 (± 790) total bears.

Page 166 – there is no mention of BE. Even though there are no bears there now, it would be appropriate to at least briefly discuss it.

Page 168 – Ungulates – include mule deer, white-tailed deer, domestic sheep, and cattle.

Page 177 – Paragraph 3 – “...forested habitats may make ungulates less available as a food source.” This sentence should be explained or deleted.

Page 230 – Literature Cited – there should be a central repository for all of the literature cited in this document. As presented now, unless a person has access to a commercial service such as JSTOR and the time and ability to contact various agencies for reports, they cannot find what the authors are referring to. A web-based portal would solve this problem and enhance transparency and the public’s understanding of the logic behind discussions.

Page 281 – Other areas – this section would benefit greatly from a few paragraphs summarizing the results of this preliminary analysis.

Page 296 – Paragraph 2 – Swenson et al (1997) was a study of bears in Scandinavia under very different circumstances than occur in the western United States.

Follow-up questions for peer reviewers - Reviewer #5

Reviewer's responses are below in red. If any further clarifications are needed, please let me know.

- (1) "As noted in Question #5, human societal factors are pivotal components to the persistence of grizzlies in areas where they are currently and expansion into areas of suitable habitat. Much of the underlying theme in Chapter 3 (Regulations) is the on-going controversy of whether the species should be listed or managed as a game animal or a predator, and "how much is enough." These are politically and emotionally charged subjects that are decided by the courts and the "court-of-public-opinion" and it is difficult to judge what the authors and their agency are comfortable with including in this document. With that in mind, I think it would be beneficial to include an objective discussion of the subject when prognosticating potential future conditions."

Please clarify the last two sentences, it is unclear what you are suggesting that we do. Are you asking us to include a discussion on the "court-of-public-opinion" in our analysis of future conditions?

Good question! What I was trying to express was that all of the robust research, comprehensive management actions and extensive information and education programs that have occurred during the past decades have resulted in increasing numbers of grizzlies on the landscape, yet there is also a commensurate increase in the controversy over how many bears there "should" be before they are de-listed and how the "excess" bears should be managed. It is not practical to expect bears to exist at levels comparable to the 1700s, and similarly it is not practical to have them at the levels we saw in the 1970s – so where is the practical compromise and how is that determined? This is especially poignant in this politically charged environment where some organizations appear to be motivated by personal gain or immovable opinions and are well-versed in legal and political strategies to either achieve their goals or prevent "the-other-side" from achieving theirs.

This is the elephant-in-the-room and is very difficult to discuss in an objective and complete manner that is politically acceptable to the agencies responsible for research and management. Perhaps it would be beneficial to at least acknowledge it in your section outlining the court cases, and/or insert it in your future conditions matrix (for your most optimistic prognostication say that a successful compromise has been achieved accepting the existence of viable bear populations in all discussed ecosystems).

- (2) It seems like page numbers got mixed up so uncertain what section this comment refers to: "Page 51 - it would be appropriate to include a paragraph or two about other anthropogenic food sources such as apiaries, granaries, livestock carrion dumps, other garbage and dumps, agricultural crops."

Chapter 2, Nutritional Ecology (Feeding), 4th paragraph

- (3) It seems like page numbers got mixed up so uncertain what section this comment refers to: "Page 166 - there is no mention of BE. Even though there are no bears there now, it would be appropriate to at least briefly discuss it."

Chapter 5, between the sections “Genetic Health in the SE” and “Summary of Connectivity and Genetic Health”