



October 9, 2018

Graham Van Tighem
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Dear Graham Van Tighem,

Re: Public Consultation on the Draft Conservation Plan for Grizzly Bears in Yukon.

Thank you for the opportunity to comment on the *Conservation Plan for Grizzly Bears (Ursus arctos) in Yukon* and to help shape future conservation efforts for this species.

Wildlife Conservation Society Canada strongly supports efforts to ensure a sustainable future for grizzly bear populations in Yukon. This species has high ecological, cultural, and economic impact within the northern boreal mountains. Human can affect its conservation status fairly readily, so it deserves pro-active planning. I hope that the comments and opinions offered in this letter will be helpful in making the draft Plan a more coherent and effective document.

My comments are organized in two broad categories: (i) General broad-scale Comments regarding process, content, and focus; (ii) Specific Comments on the detailed content. Most of the comments include at least an implicit suggestion for a change in the text. For a considerable number of these, the comment ends with a Recommendation for changes to the Plan (bold and italicized text).

General Comments

Process: Yukon Territory needs a Conservation Plan for Grizzly Bears at this time, especially in light of the national listing of the species as Special Concern under the federal Species at Risk Act. The development of a public survey, and thorough summary of the results of that survey (**Results of a public survey about grizzly bears (*Ursus arctos*) and their management in Yukon, Canada**. Technical Report MR-18-01, Yukon Environment), have been particularly useful in understanding the societal context for management actions.

Content: The draft Conservation Plan includes a lot of detail and is generally well presented. The biggest problem with the draft is how it treats the question of harvest management and ancillary issues such as population estimation. There are a number of Specific Comments about this issue in the review below, but these are the main shortcomings:

1. Great attention is given (in different sections of the document) to harvest rates, specifying the need to record harvest to the nearest percentage of the population, and giving the impression of high precision and care in managing this issue. This approach would be ideal, but it loses much of its statistical (and biological) meaning when the population estimates are potentially inaccurate and have wide ranges of confidence, being based on expert opinion of unclear age. Although this problem is inherent in grizzly bear management, the document needs to be much more frank and truthful, right from this starting section, about the difficulties. And it needs to be much more explicit about how those difficulties may be addressed through application of the precautionary principle in harvest allocations.
2. The topic of harvest management is discussed in the Plan in numerous sections, the first of which (Current Management) is too superficial for complete understanding (and requires finding key information elsewhere, but



without reference in the text). Some of the sections where the topic is re-visited are redundant. In addition some key pieces of information are missing (e.g., map of Bear Management Units). The document could be better written to present this information in all its detail in one section, so that the reader is not left with uncertainty in one place and having to digest the same information elsewhere.

3. The existence of recent population estimation studies (and other studies) on grizzly bears in Yukon is barely mentioned at all, and is only buried in the later parts of the document, without any reference or real data. Given the huge investments that government has made in these important studies, they should be front and centre in this Plan and open for public understanding.
4. The manner in which precaution may be used in harvest management is only superficially addressed.

Focus. The draft Plan covers a wide scope, and is fairly even in its focus on important issues facing grizzly bears. However, it falls short in its discussion and focus on the Actions dealing with habitat supply and management, and specifically the topic of thresholds or caps in the cumulative human footprint that a grizzly bear population may be able to sustain. Useful Actions, such as treating grizzly bears explicitly as an ecosystem value in all planning and environmental assessment, will not be sufficient if conservation planning does not recognize that limits to human activity and intensity of use of landscapes need to be adhered to for grizzly bears to continue to persist in healthy populations in Yukon. Recent research illustrates this, yet the Plan skirts this topic in too many places, noting, almost as an afterthought, that declines may already be happening in some areas where human activity is high. If there is evidence for this, then it should be brought forward and the published science and proposed conservation actions should be presented.

Specific Comments (These are organized by line number in the draft document)

Section A: Context.

- 95 The document asserts that “Based on current information, grizzly bears in Yukon are likely stable and secure,...”. It is unclear how this conclusion is reached. No data are provided, and there is no reference to the recent population estimates that Yukon Environment has undertaken. Although this is a context section, such statements should at least refer the reader to other sections of the text, or appropriate ancillary documents.
- 124 Once again there is an assertion that “...most grizzly bear populations appear to be stable in Yukon and the issues, largely, are well-managed.” This may be true, but how do managers arrive at this conclusion? There needs to be reference to some data, or sources of information. The high numbers of grizzly bears killed after becoming “problem” animals does not lend support to this argument.
- 133 The document notes that a value of being pro-active in planning is to provide “... a baseline from which to measure suggested proposals related to, or that impact, the species.” This is certainly true. However, it is not obvious that this Plan lives up to that ideal. For example, the draft document provides no real data on population estimates geographically across the territory nor mortality levels by cause in the various population units. Without a quantitative reference point in real data, the Plan provides no baseline.

Current Management of Grizzly Bears in Yukon

- 187 The text states that sustainable mortality rate is estimated at 4% of the bear population in a BMU, but then leaves too many issues unresolved for the reader to understand how this might be achieved or assessed. First, it gives no reference to time period: is this an annual rate? Second, it then states that the mortality “... can include up to 2% of the female population, and 6% of the males”. This latter statement, as written, is logically inconsistent with the overall sustainable



rate of 4%: if the gender-specific mortality rates are summed to 8%, then the total sustainable rate is far exceeded. So, how are these gender-specific rates applied when monitoring harvest? Presumably, each one can act independently as a threshold or cap on the annual harvest, but the text does not clearly indicate that, nor does it explain what happens when a rate is exceeded. Third, it gives no indication as to how a population in a BMU is estimated in the first place, and therefore how a mortality rate might be converted to a total harvest. And it does not explain whether accumulated data on known harvest is applied in real time to influence harvest in the ongoing year, or whether it is projected on to the subsequent year's allowable harvest total. **Recommendation: The document needs to be more candid regarding the difficulties of estimating a grizzly bear population (at a BMU level, accurate population estimates are rarely available) and therefore the inherent risks is projecting a sustainable annual harvest total using a rate. The document also needs to explain how efforts are made to monitor harvest, and for what time periods, to keep track of gender-specific rates for achieving a sustainable harvest rate over a series of years (If the authors decide that this level of detail is more warranted elsewhere in the document (e.g., Section E), then the current text needs to reference that).**

- 191 The text states that: "Residents are not subject to quotas but may harvest 1 grizzly bear every 3 years." This sentence seems illogical, in that an allowable harvest expressed in numbers per unit time would seem to be a quota whether it is applied to an individual or a group of hunters (e.g., the Inuvialuit harvest quota). The word quota is used to explain the application of allowable harvest (numbers per unit time) for non-residents as well. **Recommendation: The text needs to explain that harvest quotas differ in their mode of application, being applied to individual hunters for residents, but applied to groups of hunters for Inuvialuit and non-residents. It then needs to explain how those collective quotas are administered; there is no mention here of how much of the non-resident harvest quota goes via commercial guide-outfitting to non-residents and how guide-outfitting harvest of grizzly bears is integrated into the allocation process.**
- 197 The text states that "... quotas are based on bear population estimates informed by expert opinion and habitat information...", without further explanation. Left without explanation, this statement would leave many readers with a sense of unease about the validity of the science. Who are the experts? When and how do/did they make the estimates? The fact that more information is presented in Section E needs to be outlined here.
- 198 "Hunting near roads is allowed in most areas, although hunters must be away from the road and shoulder." Given the controversial nature of this current hunting approach in Yukon, this statement needs more detail and context. What do the words "near" and "away" actually mean? Perhaps more importantly, in what position with respect to the road can a bear be legally shot? **Recommendation: The document needs to much better explain the details of this currently applied hunting "rule" so that the reader can understand the physical and temporal relationship of the bear and the hunter to the habitat space created by roadsides.**
- 226 The text refers to a Volume 2 with more detailed information about management in Yukon and elsewhere. The Table of Contents of this draft Plan does not identify a Volume 2. Is it different from Section E of this document? If so, why do both exist? If it is a different document, when can it be made available? Also, this reference to the existence of more detailed information, to help in understanding the briefer text in this section, would better be inserted at the beginning of this Section so that the more detailed information can be used by the reader. **Recommendation: Volume 2 should be made available as part of this review process.**
- 233 The use of "road map" to describe this document does not seem to be an appropriate metaphor. A road map provides substantial specific direction for action. It is prescriptive with regard to route of travel, yet this document repeatedly aims to avoid being prescriptive. For example, the text does not even lay out the concept of thresholds of cumulative human impacts or footprint that should be employed in land planning to enhance the chances of sustainability.



285 Volume 2 is referenced here again. It should be made available to help understand the content of this draft Plan.

Section B: The Plan (Vision, Principles and Goals)

- 331 The Vision statement has good scope and intent, but lacks the wording of a real Vision, which needs to lay out an ideal version of the future. This is mainly because it includes the phrase “to ensure that”; this phrase detracts from the statement of ideal condition by turning the vision into a process (“ensuring”) rather than a condition.
- 335 The text is not explicit enough in indicating that the bulleted points are indeed Principles, mainly because the introductory sentence to the list of bullets doesn’t use the word Principle at all. The Principles themselves deserve more prominence in the layout, including capitalization.
- 340 This introductory sentence to the list of Principles couches those Principles in the context of “Work carried out to conserve grizzly bears...”. This is far from a sufficient context within which the Principles should be considered and applied. These principles have to be recognized and asserted within the context of all human activities that could affect this species in Yukon (including all land development and management, agricultural practices, development of transportation corridors, harvesting of many other species, cultural practices), not just “work carried out to conserve grizzly bears”.
Recommendation: the text needs to be changed to assert that the Principles in this Plan are to be considered and applied to all human activities that could affect grizzly bears as individuals, as population units, and in the sustainability of their habitats (not just work carried out for conservation).
- 341 The term “intrinsic value” deserves some qualification in order to explain what it means; although it might seem self-evident, this term can easily be used and then ignored. To WCS Canada it means that viable populations of the species have a right to exist for their own sake, and that human (i.e. extrinsic) measures of value (especially economic cost-benefit, but also ethical) are not sufficient to orient and drive management decisions. **Recommendation: The first Principle needs to better lay out the meaning of “intrinsic value”.**
- 348 The fourth principle reads: “grizzly bear conservation should respect the varied uses of grizzly bears, including cultural uses, harvest, viewing, and ecological functions”. This needs some rewording because “ecological functions” are not “uses”. **Recommendation: The text should be changed to emphasize the various “roles” or “functions” or “values” of grizzly bears, some of particular interest to humans (human culture, harvesting, viewing) and others (ecological) of interest to humans and to the natural ecosystems of which bears are a part.**
- 361 The seven Management Goals are worthy and valuable, and each one is necessary to fulfil the Vision. They are also probably sufficient in covering the scope of major conservation issues that the Plan needs to address.
- Goal 1: Foster a cultural connection to, and increased respect for, grizzly bears
- 381 The word “uniqueness” is not very appropriate or sufficient as a descriptor of cultural connections that deserve awareness, yet it is the only word used to describe that connection. First, some aspects of human cultural connections with grizzly bears may be fairly unique to Yukon, but others are not in that they pertain well beyond Yukon. Second, other aspects, apart from uniqueness, of the cultural connectivity of humans and bears that deserve increased awareness include: coexistence built on mutual respect and behavioural modification by each species; respect between the two species built on mutual recognition of power and competition; prominence of bears in human psychology and spirituality as evidenced by names for people, social groups, and places. Although the Plan may not be able to lay out all the diverse components of the historical, ethnically-specific, and current cultural connections between bears and humans, it needs to scope the question of cultural awareness more thoroughly than just the term “uniqueness”. It also needs to explicitly



recognize that bears have culture, passing knowledge and judgement between generations, and learning behavioural norms through experience with people. The cultural connections between the species run two-ways. Fostering a cultural attitude of respect for bears among humans will be enabled and strengthened by exploration and recognition of the fact that bears can develop substantial degrees of respect and tolerance of humans.

396 Action 1.4 “Promote grizzly bear awareness and safety” needs rewording (to include the word human) because the use of “grizzly bear”, apparently as an adjective, leaves much uncertainty as to who is the subject and the object of the awareness and the safety. As written it can be interpreted as promoting awareness by grizzly bears (of what?) and safety of grizzly bears (from humans?).

Goal 2: Take care of the land that grizzly bears require.

409 This paragraph correctly points out the need for consideration of bear foods (other species) in conservation of their habitats. However, it lacks mention of some of the key foods (graminoids and various forbs, as well as rodents such as ground squirrels and marmots), and so gives an incomplete and biased impression of the scope of the topic, and the wide range of habitats and ecosystem components on which bears are dependent. It also does not provide enough information about bear ecology for readers to understand the spatial scale of the conservation issue. First, grizzly bears have very large home ranges; their habitats are often patchily distributed and well separated. They have an “annual round” just like indigenous peoples had, and still do to some extent, when living on the land. The distribution and dispersion of high value habitats need to be mapped for planning. Second, a viable grizzly bear population, consisting of at least 50 breeding individuals, then requires large landscapes within which human population activity cannot exceed certain intensities. This overall spatial context regarding bear ecology needs to be made clear.

418 The document correctly points out that changes to habitats brought about by humans (e.g., agricultural land development) often negatively affect bears. However, the document does not point out: (i) that this habitat loss and alienation is the most pervasive reason for grizzly bear population declines in other parts of the species range, and therefore of paramount importance to pro-active conservation in Yukon; (ii) the full range of human activities that will lead to negative effects (the issues of new backcountry roads, residential subdivisions, and mine developments need to be explicitly laid out to emphasize the scope of this issue). Consequently, the text in this section of the Plan does not sufficiently illustrate that the Goal of taking care of habitat is ultimately the most influential goal if the Vision is to be achieved.

A variety of lines of evidence, including recent research in British Columbia¹, illustrate that there are limits to the intensity and extent of human-induced changes to habitat beyond which grizzly bear populations will decline. In other words, these limits need to be explicitly recognized and acted on if the Vision of this Plan is to be realized. The Plan correctly states that grizzly bear conservation is ultimately a question of human management (line 350 – Principle 5), and so putting limits on the extent to which humans change natural habitats is central to this reality.

428 This paragraph correctly outlines some potential shortcomings of the environment assessment process in Yukon and the way it deals with bears. However, the text just talks about “mitigation” of impacts, whereas much can be done in

¹ Lamb, C. et al. 2018. Effects of habitat quality and access management on the density of a recovering grizzly bear population. *Journal of Applied Ecology* DOI: 10.1111/1365-2664.13056.

Boulanger, J., & Stenhouse, G. B. (2014). The impact of roads on the demography of grizzly bears in Alberta. *PLoS ONE*, 9, e115535. <https://doi.org/10.1371/journal.pone.0115535>



environmental assessment to simply *avoid* impacts if they are well enough identified in advance. Resorting to mitigation is insufficient for conservation.

437 This paragraph introduces cumulative effects, and therefore begins to expose the issue raised in the previous comment – real limits to intensity of human activity on the land. However, it suggests that cumulative effects be “mitigated”. Waiting until they occur and then trying to mitigate them is not a good enough approach; conservation requires identification and assertion of limits on cumulative human activity before those limits are exceeded. ***Recommendation: the text of this section needs to be modified to make clearer the concept of limits in the intensity of human activity beyond which cumulative effects should not be permitted.***

445 The set of recommended actions for Goal 2 is generally good and necessary. However, none goes far enough towards laying out the essential planning principle and land management action that needs to be in place for true grizzly bear conservation. That principle is that “limits on the intensity of use of grizzly bear habitats by humans need to be asserted in strategic regional planning”. Action 2.5 (Develop land use guidelines for the conservation of grizzly bear habitat) goes part way, but refers only to land use guidelines which tend to be applied fairly locally and on a project-by-project basis through environmental impact assessment processes. Conservation of habitats requires assertion of limits to key aspects of human activity, such as density of linear corridors (roads and trails), over very large landscapes because of the huge areas required to support a viable grizzly bear population. This is a question for land use planning as well as environmental impact assessment. ***Recommendation: At least one of the Actions needs to explicitly assert the need for “development” AND “application”, through land use planning and development assessments, of policies and standards that lay out limits to human activity on the land that cannot be exceeded.***

Goal 3: Minimize human-grizzly bear conflicts

448 This is certainly an important Goal. The draft plan lays out the context well, and explicitly and correctly recognizes (line 461-462) that this is primarily about modifying human behaviours rather than bear behaviours.

503 The list of Recommended Actions for this Goal is good, but not complete in that it does not lay out actions to deal with all issues identified in the text. One example is the set of attractants that agriculture presents to bears, including chickens, pigs, berry crops, and honeybee hives. When bears can get access to these agricultural assets for food, the bears will become a problem and often will die. The onus is on people to exclude bears with fencing. ***Recommendation: The Actions need to explicitly recommend changes to agricultural policy that move away from voluntary compliance and replace it with guidelines that make fencing obligatory.***

Goal 4: Ensure grizzly bear harvest is sustainable and respectful

508 This is clearly an important goal, given the general consensus that some harvest is justifiable on cultural grounds and also as a result of likely human-bear conflicts. The text usefully talks about the biological issues of estimating a sustainable harvest, and also the ethical concerns about specific ways of killing bears.

The question of sustainable harvest level is crucial, but is dealt with in a manner that is frustrating and incomplete from a biological perspective. The first Action under this Goal (4.1 on line 573) lays out the worthwhile objective to establish a total allowable harvest for each grizzly bear population management unit in the Territory. This is frustrating because earlier parts of the Conservation Plan (e.g., Current Management section on line 178) give the strong impression that this Action is already employed and robustly adhered to, whereas the text of this section points out that population estimates for these management units are many decades old and likely out-of-date, and consequently need to be refined with better



data, models, and the precautionary principle (lines 541-544). This more candid assessment of Current Management should have been part of the earlier section of the draft Plan where readers get the impression that harvest is well understood and managed. Part of the problem is that the same topics are dealt with twice or more through the Plan. The reader needs to understand that population estimates are very difficult and costly to achieve, and that management often has to proceed without the best information that could conceivably be acquired. Precaution is absolutely necessary.

Recommendation: The Plan should be more candid and up-front about the current context, difficulties, and shortcomings of grizzly bear population estimation and harvest management in the Territory, and the very real and unavoidable uncertainties in managing a harvest when accurate and precise population estimates are not available.

An additional frustration is that the Yukon Environment Department has invested large amounts of money and staff time over the past 15 years on studies of grizzly bears aimed at estimating population densities (and other topics) on the Yukon North Slope and in the Southern Lakes region. These studies are hardly even mentioned, and are not referenced, in this draft Plan. These could be providing direct context and information for the Yukon public to be oriented to the status of grizzly bears in this part of their range compared to elsewhere, the likely sustainability of the recent harvests, and the spatial scale at which a population of this species needs to be assessed. Why isn't this biological information part of this Conservation Plan? ***Recommendation: The Conservation Plan must bring forward the results of the studies the Environment Department has undertaken in recent decades so that Yukoners can benefit from the recent investments in biological studies and relate to the resulting population estimates.***

Also, this Plan does not have a map of the grizzly bear population management units. The reader needs to be aware of the those units and their boundaries to comment on how reasonable they appear to be with respect to regional variations in grizzly bear diet, in likely connectivity across the landscape, and plausible threats to population sustainability.

Recommendation: The Conservation Plan needs to include a map of grizzly bear population management units.

Regarding the ethics of harvesting bears under specific circumstances, the Plan talks about roadside hunting. Although the public survey indicated that 75% of respondents do not think such harvesting is ethical, the Plan states that there is "...no clear path forward on this issue at the territorial level...". This is a surprising conclusion: how much more than 75% does government need in order to act? The implicit conclusion is that unanimity is required before government is willing to act. In that case, government is refusing to take on its responsibility as steward of the resource because unanimity is unachievable.

There are solid and inter-related biological and ethical reasons for not allowing roadside hunting of bears. Roadsides are human-created hotspots of foods, especially valuable to bears during periods of food stress, - early greenup of forbs and graminoids in spring when foods are scarce, and survival sources of plants (notably roots of *Hedysarum* sp.) when berry crops fail in late summer. Like fruit orchards², these human-created hot spots can easily become ecological traps when mortality is allowed (legal harvest from the road) or occurs accidentally (vehicle collisions). Bears are inevitably attracted to the roadside foods so roadside harvest is concentrated on populations whose ranges include substantial road networks thereby adding to the cumulative impact of numerous stressors on these populations that live close to people. The ethical concerns with such harvest are that: (i) it is not fair because humans have created the habitats and essentially baited the bears to the sites; (ii) it is not sporting because humans have to do very little for a successful hunt; (iii) it puts humans at risk because of the proximity of the use of firearms to lots of other human activity including passive viewing of the same individual bears; (iv) it can readily create a situation where humans with different perspectives on the ethics of the

² Lamb, C. et al. 2017. Forbidden fruit: human settlement and abundant fruit create an ecological trap for an apex omnivore. *Journal of Animal Ecology* 86: 55-65.



situation have to deal with one another in close proximity thereby raising tension and risking offence to those people who are viewing the bears but not intent on harvest.

In addition, allowing roadside hunting contradicts Goal 5 in the draft Plan, which is to foster respectful bear viewing. Most grizzly bears viewed by people in Yukon are seen from a road. The positive and rewarding experience most people have when viewing a bear would likely be shattered if the viewer(s) witness, or even hear about, a roadside kill. Permitting one sector of society to harvest a bear from the road seems contradictory to the fostering of respect on the part of viewers who encounter a bear along a road. **Recommendation: The Conservation Plan should assert that roadside hunting of bears needs to be made illegal across Yukon.**

The draft Plan does not address the issue of a spring hunting season for grizzly bears. Such a hunt is allowed in significant portions of the territory. By not mentioning this hunt, the Plan seems to assume that there are no concerns with this hunt. There are however biological and ethical concerns. A spring hunt in which a lactating female is shot will generally result in the death of her orphaned cub(s). Whether or not a bear has young is not always evident, especially when cubs are young and can readily climb trees. When they sense an apparent threat (e.g., could be an approaching hunter in spring) females will often get their cubs to climb a tree after which she moves to investigate the threat. What the hunter sees is a single bear, with no cubs evident. The hunting regulations correctly urge hunters to shoot single bears rather than one out of a group of bears because in the latter circumstance the hunter may be killing a bear on which other members of the group depend (e.g., mother of still dependent but quite large offspring). A single lactating mother, who has sent her young up a tree, would appear for many hunters to be a suitable target, but in fact should not be killed because of the slow reproductive rate in this species. Consequently, there is a strong demographic argument for stopping a spring hunt so as to remove risk of killing reproductively active females. There is also a strong ethical argument for stopping a spring hunt so as to remove the risk of orphaning helpless cubs. **Recommendation: The Plan should address the issue of a spring hunt rather than ignoring it, and should state the need to stop the spring hunt.**

565 The text discusses the issue of non-resident hunters to some extent. Unfortunately it does not explain how a non-resident is defined. According to the hunting regulations there are two types of non-resident hunter when big game is concerned: (i) "alien" or from another country, who must be guided by a registered Yukon outfitter; (ii) Canadian non-residents (from another province or territory) who must be guided by a registered Yukon outfitter or by a special guide. However, special guides are not allowed to take clients on hunts for grizzly bears. So non-resident grizzly bear hunting can only happen under the guidance of a registered outfitter. This fact needs to be clearly laid out, and should have been addressed earlier in the document (e.g., line 190).

Goal 5: Foster respectful grizzly bear viewing

577 This Goal is worthwhile and well laid out. One aspect needs some attention, but is not mentioned. That is the question of who should be able to access high quality grizzly bear viewing sites, and so, how they should be managed. Sites where grizzly bears predictably come to feed and are easily viewed by people are relatively uncommon. These sites need to be carefully controlled and managed so as to avoid harassment of the bears and danger to people, so governments frequently intervene to manage these sites. One such Yukon site in Ni'iinlii'njik Territorial Park (Fishing Branch) allows one commercial operator (Bear Cave Mountain Eco-Adventures) to have monopoly on visitor traffic and appears to be well managed. The monopoly, however, means that access is far from equitable for all Yukoners; cost is likely prohibitive for many. By contrast, there are ways to manage bear viewing sites such that access is less determined by wealth, but is more equitable; these include lottery systems.



The lack of mention of how high-intensity bear viewing sites should or would be managed is an oversight in the draft Plan. This needs explicit attention, even if the assertion is that there are no other such sites (with high bear concentrations and easy viewing by people) in Yukon. The past history of management of the Ni'iiinlii'njik site is a good example of how proactive management for respectful bear viewing has worked well. How will government(s) approach other sites?

Recommendation: The Plan needs to address past and future management of, and means of access to, sites where grizzly bears are predictably encountered and could be readily viewed by the public.

Goal 6: Improve decision-making by acquiring better knowledge about grizzly bears

627 In general this section is reasonably discussed and laid out. There are some concerns with the wording and emphasis. First, the Plan states that some decision-making about grizzly bear management is societal and needs to be made without perfect knowledge, and therefore should be subject to the precautionary principle. This might seem straightforward, but the text should say that **the entirety** of grizzly bear management is subject to uncertainty, right from the biological/demographic aspects through to the management of various human behaviours and activities. The calculation of allowable harvest entails significant uncertainty because of imprecision in population estimates; this is where precaution definitely needs to be applied.

Second, the text provides new information on some key aspects of harvest management (a topic introduced and addressed a number of places earlier in the document), namely the source of boundaries around Bear Management Units, and the fact that some DNA-derived population estimates for grizzly bears have been made in recent decades. Both of these pieces of information need to be brought forward earlier in the document, where they are necessary to interpret and understand the Plan. In addition, the mention of the DNA-derived population estimated is insufficient, in that no data are provided and there is no reference to a Report or paper, and therefore no ability for the reader to understand the statement that: "Results from these newer approaches, when compared to the expert-based estimates, suggest grizzly bear population size may be overestimated in areas where there is more human development and access." Also, the wording of this sentence leaves doubt as to its meaning: does it intend to convey that expert-based population estimates were over-estimates, or that one or other estimation process produces over-estimates in areas where human footprint is higher?

Goal 7: Better understand human dimensions of grizzly bear conservation

680 This goal is reasonable and seems adequately laid out.

Section C: Putting the Plan into Action

709 This paragraph outlines how the precautionary principle might be applied to grizzly bear harvest management. As the document indicates, it is certainly valid and necessary to apply precaution to this activity because of the imprecision (and potential inaccuracy) in population estimates. However, there are two problems with the text as written. First, it does not lay out a sufficient set of mechanisms whereby precaution could be applied. The text indicates that precaution will be applied "...As new information becomes available...". It is not sufficient to wait for new information; existing knowledge of grizzly bear demographic processes can give insights into sustainable harvest rates, which are proportions of an estimated population (as indicated earlier in the draft Plan; Line 187). The question is how are these rates applied when setting allowable harvest? To act cautiously, they should be applied to the lower end of the range of population estimates (e.g., the lower bound of the 95% confidence interval around mean population estimate for a BMU; or the lower end of a range of population estimates for a BMU). Merely waiting until new information is available, and then acting, but not indicating in the Plan what kind of action would be taken, contradicts the earlier statement in this paragraph in the Plan that



“managers should not wait for scientific certainty to proactively minimize risk...”, and also provides no clear analytical rule or mechanism for being precautionary. **Recommendation: The Plan needs to assert that managers act cautiously by using the lower end of a range of population estimates on which to calculate allowable harvest.**

- 716 The text states that “...total allowable harvest rates for BMUs should be established...”, whereas earlier sections of the Plan (e.g., Current Management, line 178) suggest that these are already calculated and applied. If these have not been calculated and applied historically, then the text needs to be more candid about that fact throughout.
- 775 A “Prioritized Implementation Table and Timelines” is presented. The Table includes no timelines, so this is a misleading title. Also, the “Suggested territorial priorities” column consists of colour-coded boxes each with a number from 1 to 3, but there is no caption to explain the numbers. One can infer that “1” is the highest priority, and “3” the lowest, but what do these mean in terms of actual likelihood of serious attention within any specific time period? The Table includes all Actions proposed under each of the seven Goals laid out earlier in the Plan. Many Actions are interrelated and/or overlapping, so interpretation is not straightforward. Many of the priorities seem reasonable (e.g., high priority for Action 4.3 regarding controls on road-side hunting). However, in general Goal 2 (Take care of the land that grizzly bears require), and all its Actions, deserve particular attention (highest priority) because habitat loss is the primary reason for decline of this species elsewhere in its range, and may well be occurring already in Yukon.

Section D. Plan Review

- 780 This Section is generally reasonable.

Section E. Background Information

- 809 Much of the information in this section is valuable context for the Plan, and well summarized. Although there is recognition that human presence on the landscape, including habitat alterations by humans, represent the biggest conservation issue for grizzly bears, this Section does not adequately summarize recent science on this topic (especially from Alberta and British Columbia). Recent and ongoing research is uncovering thresholds of human footprint, and particular issues with access management, that should be summarized here and are relevant to conservation planning for bears in Yukon.

Section G. Supplemental Information

995 Comment Boxes.

- 1014 Box 2: Looking north to progressive harvest management. This box outlines “progressive” harvest quotas in the Inuvialuit Settlement Region (ISR) that differ from those outlined for the rest of Yukon in this draft Plan. If this Box labels the ISR system as “progressive”, why is that system not applied to all of Yukon? The discrepancy between the two systems, applied in different parts of Yukon, needs better explanation. Although there is room for jurisdictional differences under land claims, it is not evident why biological conditions are assumed to be different in the various jurisdictions.
- 1091 Box 6: Yukon’s outfitter quota system. The amount of detail in this Box is partly redundant with other sections of text, indicating that this Box is unnecessary. It is also in some ways more detailed (e.g., outline of 3-year accounting period), so should actually be part of the main text, also indicating that this Box is unnecessary. The text could also be written to better lay out the accounting process over a three-year accounting period, indicating how all types of mortality are factored together in assessing rates: the content of this box is pertinent to much more than just the outfitter quotas, and should be part of the main text under Current Management.



Thank you for taking the time to consider these comments and recommendations. I trust that they will also be circulated by the Fish and Wildlife Management Board to the Plan authors as part of the review process.

Yours sincerely,

A handwritten signature in dark ink that reads 'Donald G Reid'. The signature is written in a cursive style with a long, sweeping underline for the 'D'.

Donald G. Reid, PhD
Conservation Zoologist