

# **MANAGEMENT OF GRIZZLY BEARS IN BRITISH COLUMBIA: A REVIEW BY AN INDEPENDENT SCIENTIFIC PANEL**

**Interim report - February 2002**

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This interim report includes a draft outline of topics that will be covered in the final report of the scientific panel on grizzly bear hunting in British Columbia (BC) and a description of the process used to develop the outline. The final report may include additional items not included in the outline, based upon suggestions and further information received by the panel.

The panel, established by the BC Ministry of Water, Land and Air Protection (MWLAP) in July 2001, was charged with reviewing methods currently used to estimate grizzly bear populations, provincial management strategies and harvest procedures, and related issues deemed significant to grizzly bear conservation in BC (Appendix 1). Panel members were appointed from a list of nominees provided by the International Association for Bear Research and Management (IBA), the professional organization of bear biologists around the world and publisher of the peer-reviewed journal, *Ursus*.

The MWLAP restricted panel membership to scientists not associated with bear management in the province. The panel consists of 6 scientists, including 2 university professors, 2 members of non-governmental organizations, 1 state government employee, and 1 scientist from the private sector. Additionally, all members of the panel work outside of BC and are not employed or associated with MWLAP. Dr. Fred Bunnell of the University of British Columbia was originally appointed to the panel and selected by panelists as chairman, but he subsequently resigned for personal reasons unrelated to the issue under consideration.

The panel is aware that grizzly bear hunting in BC is a highly charged philosophical issue for many people both in favor of and opposed to grizzly bear hunting. The panel, however, decided that such philosophical positions were not an appropriate subject for scientific review. Correspondingly, the final report of the panel will focus on the technical merits of the hunting system currently practiced in BC and whether it is adequate to assure the long-term persistence of grizzly bears in the province. The panel will also address other technical issues that may affect persistence of grizzly bears in BC since mortality as a consequence of hunting is only one factor potentially affecting persistence.

The panel met twice in Victoria, BC (9-10 October and 7-8 December, 2001), and once in Spokane, Washington (30-31 January, 2002). We have also consulted via conference calls and email. The initial task of the panel was to become acquainted with the issues, begin the acquisition of pertinent reports and publications, and prepare an outline to address the terms of reference. A substantial body of literature directed at grizzly bear conservation issues in BC is available from agency and non-governmental sources. The panel also requested written input from individuals and groups that have expressed concern about grizzly bear management procedures in BC as well as from scientists who have worked on grizzly bear management and research in BC. In response to these requests, reports were received from several of the groups contacted including reports critical of BC grizzly bear management. We anticipate additional responses will occur as a result of the circulation of this interim report. The panel invites written testimony pertinent to our mandate.

Based on the panel's terms of reference and our current understanding of the context and details of grizzly bear management in the province, we are focusing on four areas of investigation. These areas include: (1) the process and methods used to develop estimates of grizzly bear population sizes used in allocating harvest quotas; (2) harvest data and harvest strategies; (3) long-term sustainability of selected grizzly bear populations; and (4) habitat changes potentially impacting grizzly bear populations. Other analyses may be initiated as the panel continues to probe the issues and collect reports and comments from various parties. While the panel is ultimately responsible for completing the terms of reference, the panel may contract for analyses of specific topics.

The following outline provides a structure for the panel's review, which is scheduled for completion by December 2002.

## DRAFT OUTLINE

- I. EXECUTIVE SUMMARY
- II. INTRODUCTION
  - A. Context
    - i. Importance of grizzly bears to society.
      - 1. Considered by many as a public treasure, due to its physical stature, appearance, uniqueness, relative rarity, and demeanor; viewed as a symbol of wilderness.
      - 2. Source of potential recreation, in terms of viewing and hunting.
      - 3. Economic benefit to areas and businesses supporting viewing or hunting.
      - 4. Economic detriment in terms of livestock depredations and loss of property. Also a potential threat in terms of injury to humans.
      - 5. May serve as an indicator of environmental changes attributable to human activities.
      - 6. Others
    - ii. Importance of grizzly bears in natural systems
      - 1. Distribute nutrients in ecosystems.
      - 2. Excavate ground in pursuit of burrowing rodents and in search of roots, tubers, and bulbs.
      - 3. May limit ungulate populations.
      - 4. May help maintain biodiversity (umbrella species).
  - B. Purpose of review.
    - i. Debate over grizzly bear management in the province.
    - ii. Terms of reference of current panel. The panel will conduct an independent review of and provide recommendations on:
      - 1. Methods currently used to estimate grizzly bear populations in BC;
      - 2. Provincial management strategies and harvest procedures regarding grizzly bear hunting;
      - 3. Related issues deemed significant to grizzly bear conservation.
- III. BACKGROUND
  - A. Brief overview of bear management in North America.
    - i. Patterns and causes of bear declines in North America.
    - ii. Management principles used to restore bear populations.
    - iii. Methods of population estimation.
    - iv. Methods of trend assessment.
    - v. Concept of sustained yield.

- vi. Estimation of sustainable harvest.
- vii. Assessment of harvest data.
- viii. Significance of human-induced changes in habitat.
- ix. Role of refugia.
- x. Costs of research associated with harvesting bears on sustained basis.
- xi. Roles of public attitudes and politics in bear management.

- B. Brief overview of management of grizzly bears in BC.
  - i. Historical perspective.
  - ii. Provincial conservation strategy.
  - iii. Genetic considerations.
  - iv. Current regulations (seasons, reporting, bags, guides, administrative structure).
  - v. Educational programs.
  - vi. Roles of MWLAP and Ministry of Forests.

#### IV. METHODS: Process used by the panel to complete the review.

- A. Review of written information.
  - i. Material provided by the MWLAP relating to estimation of bear population size, provincial management strategies, and harvest procedures.
  - ii. Published and gray literature relating to bear management in BC.
  - iii. Material provided by other scientists; some scientists may be asked to make presentations to the panel.
  - iv. Material solicited from interested organizations directly relating to the terms of reference.

- B. Independent analyses
  - i. Methods and assumptions for estimating population size and allowable harvest.
  - ii. Harvest data and harvest strategies.
  - iii. Degree of risk associated with provincial management strategies in selected populations.
  - iv. Trends in habitat.
  - v. Others.

#### V. RESULTS AND DISCUSSION

- A. Population estimation
  - i. Description and critical review
    - 1. Fuhr-Demarchi method, critical assumptions, and advantages and disadvantages of method for estimating population size.
    - 2. Standard mark-recapture, critical assumptions, and advantages and disadvantages of method for estimating population size.

3. DNA mark-recapture, critical assumptions, and advantages and disadvantages of method for estimating population size.
  4. Is the MWLAP estimate of 13,000-14,000 grizzly bears credible and defensible? What is the basis for an estimate of 4,000 bears and is this credible and defensible?
- ii. Specific issues framed as questions.
1. Is there a need for estimates of population size, and, if so, at what geographic scale?
  2. Are population size estimates and subsequent harvest goals adequate for scientific bear management? Are the linkages between habitat and estimated bear density reasonable and/or conservative?
  3. Is the step-down process (for reducing estimated bear density based on habitat alteration and past harvests) realistic and/or conservative? Can it be simplified?
  4. What is the risk of population decline/loss for ranges of population size and vital rates under current management strategies? What is the minimum population size needed to support current harvests?
  5. What would be the impact on population trends assuming current harvest levels if the Fuhr-Demarchi method is a 10, 20, 30, 40%...etc. overestimate?
  6. How do present habitat-based estimates of population size compare with estimates derived from bear studies (e.g., DNA, mark-recapture/resight) for the same study areas in BC, and areas of similar habitat outside of the province? Are these comparisons adequate to evaluate the Fuhr-Demarchi methodology?
  7. Are there empirical indicators of trends in grizzly bear populations that could be used to augment and compare with Fuhr-Demarchi estimates?

## B. Population management

### i. Description and critical review

1. Estimation of bear mortalities (i.e., hunter harvest, non-hunting human-caused mortality, natural mortality, and unreported mortality).
2. Determination of allowable harvest.
3. Administration and establishment of regulations.
4. Criteria for closing populations to harvest.
5. Policy for dealing with problem bears.
6. Public education to reduce human-bear conflicts.

### ii. Specific issues framed as questions.

1. Are the currently designated Grizzly Bear Population Units (GBPUs) reasonable and are they used appropriately in harvest management?
2. Are allocation procedures (numbers and geographic distribution) appropriate for maintaining locally sustainable harvests? Are annual allowable rates of harvest in GBPUs sustainable? Do differences in boundaries of harvest units and guide/outfitter areas result in local areas of over harvest?
3. Are harvest allocations conservative/too conservative?
4. Are criteria used for closing areas to harvest adequate to ensure long-term persistence of populations?
5. Should density dependent effects be incorporated into the harvest management strategy? If so, how?
6. What is the significance of precise kill location data to management of grizzly bear hunting?
7. Are non-hunted refugia necessary to sustain populations? If so, are the size and distribution of non-hunted refugia in BC adequate?
8. Do harvest data (i.e., sex and age composition, number) in selected populations show any indication of population decline (i.e., over-harvest)?

#### C. Habitat condition/assessment

##### i. Description and critical review

1. Administration and management of grizzly bear habitat in BC.
2. Patterns of habitat use by grizzly bears in the province.
3. Relationships between access and bear mortality and distribution.
4. Trends in land use patterns, habitat fragmentation, and probable effects on bears in coastal forests.
5. Trends in land use patterns, habitat fragmentation, and probable effects on bears in interior forests.
6. Predictions for future changes in grizzly bear habitat.

##### ii. Specific issues framed as questions.

1. How significant is habitat loss relative to harvest in the long-term persistence of grizzly bears?
2. Are trends in bear mortality correlated with environmental factors such as changes in land use? Is this appropriately integrated into the step-down process?
3. Where are the major areas of habitat fragmentation in the province, and what are the effects on bear populations?

4. Is the administrative structure for habitat management in BC adequate to ensure long-term persistence of grizzly bears?

## VI. MANAGEMENT IMPLICATIONS

## VII. CONCLUSIONS AND RECOMMENDATIONS

- A. General assessment of grizzly bear populations and bear habitat.
- B. Prescription for bear management over the short- and long-terms.
  - i. Suggested changes to current management strategies and protocols.
  - ii. Information needs.

## VIII. REFERENCES

## IX. APPENDICES

- A. Terms of reference

### **Grizzly Bear Scientific Panel Peer Review of Population Estimates and Harvest Procedures: Terms of Reference**

#### **Purpose:**

The purpose of the panel is, in the context of grizzly bear conservation science, to conduct a review to ensure that hunting, as it is currently managed, does not threaten the long term conservation of grizzly bears in British Columbia and, if necessary, to make recommendations for improvements to the existing harvest management regime.

#### **Reporting to:**

Minister of Water, Land and Air Protection

#### **Structure and composition:**

The panel will consist of a minimum of five respected bear scientists, appointed for a period of up to two years.

#### **Mandate:**

The panel will conduct an independent review of, and provide recommendations on:

- (1) the methods currently used to estimate grizzly bear populations in British Columbia.
- (2) Provincial management strategies and harvest procedures regarding grizzly bear hunting; and
- (3) Related issues deemed by the panel to be significant to grizzly bear conservation.

#### **Support to the panel:**

The panel may hire a full-time biologist or related scientific position to assist it with analysis, drafting of reports and co-ordination. Salary and expenses for this position will be covered by government as will logistical support, including travel expenses and honoraria, for the panel.

#### **Timelines:**

The duration of the review will be contingent on the availability of data and the degree of revision in management strategies and practices recommended by the panel.

The panel will provide an interim report by January 31, 2002, and a final report on or before December 31, 2002.

**Consultation and liaison:**

The panel may request whatever advice and assistance it requires from wildlife biologists and scientists within government.

The panel may solicit advice and submissions from other scientists and the public as it feels necessary. The manner and timing of this solicitation will be decided by the panel. To maintain the scientific independence and focus of the panel, requests to the panel from the public or the media will be routed through the office of the Assistant Deputy Minister, Wildlife, Habitat and Enforcement Division.

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Additional appendices

- B. Harvest data analysis
- C. Risk analysis
- D. Habitat analysis
- E. List of people and organizations providing input
- F. Others