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An Evaluation of the Woodland Caribou Management Process in Alberta

by

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A Masters Degree Project Thesis submitted to the Faculty of Environmental  
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Faculty of Environmental Design

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# **ABSTRACT**

## **An Evaluation of the Woodland Caribou Management Process in Alberta**

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A Master's Degree Project submitted to the Faculty of Environmental Design in partial fulfillment of the requirements for the degree of Master of Environmental Design (Environmental Science).

Woodland Caribou are designated as "threatened" in Alberta under the Alberta Wildlife Act. In Alberta, the Boreal Caribou Committee (BCC) consists of a restricted range of stakeholders (industrial users, provincial government land and wildlife managers, and university researchers) that make management decisions regarding resource development and the conservation of woodland caribou. In January 2000 the BCC Guidelines Subcommittee was formed to review existing industrial operating guidelines from across northern Alberta and draft a set of consolidated guidelines for implementation on designated northern Alberta caribou ranges.

In the first part of my thesis I analyzed the participatory nature of the BCC and evaluated it according to a framework for evaluating the public participatory process. I explored the characteristics of the committee that were both supportive and barriers to the collaborative process. I also assessed the dispute resolution techniques employed through the BCC Guidelines Subcommittee. The results showed that the BCC needed to improve on educating and informing the stakeholders and public, incorporating public values into decision-making, improving the quality and innovativeness of decisions, fostering trust among stakeholders and the public, and reducing conflict among the stakeholders, if it is to allow a public participatory forum for the management of woodland caribou. I made specific recommendations for the improvement of the public participatory process within the BCC.

In the second part of my thesis I facilitated an evaluation of the proposed consolidated industrial operating guidelines for caribou conservation in the Boreal Forest Natural Region of Alberta by the BCC Guidelines Subcommittee. The evaluation considered the potential of the proposed consolidated guidelines to reduce the cumulative effects of existing and new development in caribou range in comparison with existing regional guidelines. Possible future alternatives for management of industrial activities in caribou range were also considered. Overall, the guidelines evaluation showed that they fail to satisfactorily address speeding up the recovery of existing disturbance, minimizing the amount of new development and managing the total amount of activity on caribou range. They have also not improved on the old guidelines in terms of protection of caribou and their habitat. The majority of respondents, from industry and government, favoured a management scenario that limited the cumulative amount of industrial activity on caribou range. Government policy adjustments, a cumulative effects modeling tool, and specific recommendations for the improvement of the consolidated guidelines, must be addressed for the management of the cumulative amount of activity on caribou range.

**KEYWORDS:** Boreal Caribou Committee, collaborative decision-making, cumulative effects, industrial operating guidelines for caribou range, interest based dispute resolution, public participatory resource management, woodland caribou

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## TABLE OF CONTENTS

|  |           |
|--|-----------|
| <b>CHAPTER 1: THE STATUS OF WOODLAND CARIBOU, CAUSES FOR DECLINE, AND MANAGEMENT IN NORTHERN ALBERTA .....</b> | <b>1</b>  |
| 1.1 STATUS OF WOODLAND CARIBOU .....   | 1         |
| 1.2 CAUSES FOR WOODLAND CARIBOU DECLINE.....   | 3         |
| 1.3 WOODLAND CARIBOU MANAGEMENT IN ALBERTA .....   | 5         |
| 1.4 ISSUES .....   | 9         |
| 1.5 PURPOSE.....   | 9         |
| 1.6 APPROACH.....  | 10        |
| 1.7 LITERATURE CITED .....   | 12        |
| <b>CHAPTER 2: PARTICIPATORY RESOURCE MANAGEMENT .....</b>  | <b>15</b> |
| 2.1 INTRODUCTION.....  | 15        |
| 2.2 PUBLIC PARTICIPATION IN RESOURCE MANAGEMENT .....  | 15        |
| 2.3 DISPUTE RESOLUTION IN PUBLIC RESOURCE MANAGEMENT.....  | 21        |
| 2.3.1 Separating the People From the Problem.....  | 21        |
| 2.3.2 Focusing on Interests, Not Positions .....   | 22        |
| 2.3.3 Inventing Mutual Options for Mutual Gains .....  | 23        |
| 2.3.4 Using Objective Criteria.....  | 24        |
| 2.4 LITERATURE CITED .....   | 25        |
| <b>CHAPTER 3: EVALUATION OF PUBLIC PARTICIPATION WITHIN THE BOREAL CARIBOU COMMITTEE .....</b>                 | <b>27</b> |
| 3.1 INTRODUCTION.....  | 27        |
| 3.2 METHODS .....  | 29        |
| 3.2.1 Participant Observation.....   | 29        |
| 3.2.2 Key Informant Interviews .....   | 30        |
| 3.2.3 Framework for Evaluation of Public Participation in the BCC .....  | 32        |
| 3.2.3.1 Criterion 1: Educating and Informing Stakeholders and the Public .....                                 | 33        |
| 3.2.3.2 Criterion 2: Incorporating Public Values into Decision-making .....                                    | 33        |
| 3.2.3.3 Criterion 3: Improving the Quality and Innovativeness of Decisions .....                               | 34        |

|   |   |           |
|---|---|-----------|
| 3.2.3.4   | <i>Criterion 4: Fostering Trust Among Stakeholders and the Public .....</i>   | <i>34</i> |
| 3.2.3.5   | <i>Criterion 5: Reducing Conflict Among Participating Stakeholders .....</i>  | <i>34</i> |
| <b>3.3</b>  | <b>RESULTS .....</b>  | <b>35</b> |
| 3.3.1   | <b>Criterion 1: Educating and Informing Stakeholders and the Public .....</b>   | <b>35</b> |
| 3.3.2   | <b>Criterion 2: Incorporating Public Values into Decision-making .....</b>  | <b>36</b> |
| 3.3.3   | <b>Criterion 3: Improving the Quality and Innovativeness of<br/>Decisions .....</b>   | <b>38</b> |
| 3.3.4   | <b>Criterion 4: Fostering Trust Among Stakeholders and the Public .....</b>   | <b>39</b> |
| 3.3.5   | <b>Criterion 5: Reducing Conflict Among Participating Stakeholders .....</b>  | <b>40</b> |
| <b>3.4</b>  | <b>DISCUSSION .....</b>   | <b>41</b> |
| <b>3.5</b>  | <b>MANAGEMENT IMPLICATIONS .....</b>  | <b>50</b> |
| <b>3.6</b>  | <b>LITERATURE CITED .....</b>   | <b>52</b> |
| <b>CHAPTER 4: EVALUATION OF PROPOSED INDUSTRIAL OPERATING<br/>GUIDELINES FOR WOODLAND CARIBOU RANGE IN NORTHERN<br/>ALBERTA.. .....</b> |   | <b>55</b> |
| <b>4.1</b>  | <b>INTRODUCTION.....</b>  | <b>55</b> |
| <b>4.2</b>  | <b>METHODS .....</b>  | <b>57</b> |
| 4.2.1   | <b>Participant Observation.....</b>   | <b>59</b> |
| 4.2.2   | <b>Questionnaire .....</b>  | <b>60</b> |
| 4.2.3   | <b>Key Informant Interviews .....</b>   | <b>60</b> |
| <b>4.3</b>  | <b>RESULTS .....</b>  | <b>61</b> |
| 4.3.1   | <b>Existing Guidelines for Industrial Activity .....</b>  | <b>61</b> |
| 4.3.2   | <b>Participants' Evaluation of Proposed Consolidated Guidelines –<br/>Questionnaire Results .....</b>                         | <b>66</b> |
| 4.3.2.1   | <i>Recovery of Existing Disturbances .....</i>  | <i>66</i> |
| 4.3.2.2   | <i>Management of New Development .....</i>  | <i>68</i> |
| 4.3.2.3   | <i>Management of the Amount, Spatial Extent, Distribution and Timing of<br/>Industrial Activity Within Caribou Range.....</i> | <i>68</i> |
| 4.3.2.4   | <i>Guideline Comparison.....</i>  | <i>70</i> |
| 4.3.3   | <b>Management Alternatives Proposed by the BCRP – Key<br/>Informant Interview Results .....</b>                               | <b>70</b> |
| 4.3.3.1   | <i>Scenario #1 – Full Protection of Caribou Ranges With No Industrial Develop<br/>Development .....</i>                       | <i>71</i> |
| 4.3.3.2   | <i>Scenario #2 – Unrestricted Industrial Development in All Caribou Ranges .....</i>  | <i>72</i> |
| 4.3.3.3   | <i>Scenario #3 – Protection of Some Caribou Ranges While Allowing Unrestricted<br/>Industrial Development in Others .....</i> | <i>73</i> |

|                   |  |            |
|-------------------|--|------------|
| 4.3.3.4           | <i>Scenario #4 – Spatial and Temporal Rotation of Industrial Activity Within Each Caribou Range.....</i>                                     | <i>74</i>  |
| 4.3.3.5           | <i>Scenario #5 – Limited Amount of Activity in Caribou Ranges.....</i>   | <i>75</i>  |
| <b>4.4</b>        | <b>DISCUSSION .....</b>  | <b>77</b>  |
| 4.4.1             | <b>Questionnaire – Participants’ Evaluation of Proposed Consolidated Guidelines.....</b>   | <b>78</b>  |
| 4.4.2             | <b>Alberta Government Policy Barriers To Managing Industrial Activity On Caribou Range.....</b>  | <b>85</b>  |
| 4.4.2.1           | <i>Alberta Land and Forest Service Policy on Closure of Existing Access .....</i>  | <i>85</i>  |
| 4.4.2.2           | <i>The Pipeline Act.....</i>   | <i>87</i>  |
| 4.4.2.3           | <i>Posting of Land Sales.....</i>  | <i>87</i>  |
| 4.4.3             | <b>Key Informant Interviews .....</b>  | <b>89</b>  |
| <b>4.5</b>        | <b>GENERAL RECOMMENDATIONS AND CONCLUSIONS .....</b>   | <b>90</b>  |
| <b>4.6</b>        | <b>LITERATURE CITED .....</b>  | <b>95</b>  |
|                   | <b>CHAPTER 5: RECOMMENDATIONS AND CONCLUSION .....</b>   | <b>99</b>  |
| <b>5.1</b>        | <b>INTRODUCTION.....</b>   | <b>99</b>  |
| <b>5.2</b>        | <b>RECOMMENDATIONS.....</b>  | <b>99</b>  |
| 5.2.1             | <b>Recommendations for Improvement in the Public Participatory Process within the BCC .....</b>  | <b>99</b>  |
| 5.2.2             | <b>Recommendations for Improvement to the Proposed Consolidated Industrial Operating Guidelines for Caribou Range .....</b>                  | <b>103</b> |
| <b>5.3</b>        | <b>CONCLUSION .....</b>  | <b>106</b> |
| <b>APPENDIX 1</b> | <b>PROPOSED GUIDELINES EVALUATION QUESTIONNAIRE</b>  |            |
| <b>APPENDIX 2</b> | <b>PARTICIPANTS’ EVALUATION OF PROPOSED CONSOLIDATED GUIDELINES AND ALTERNATIVE MANGEMENT SCENARIOS WITH RECOMMENDATIONS FOR IMPROVEMENT</b> |            |
| <b>APPENDIX 3</b> | <b>PROPOSED CONSOLIDATED GUIDELINES AND EXISTING REGIONAL GUIDELINES FOR INDUSTRIAL ACTIVITY ON CARIBOU RANGES IN NORTHERN ALBERTA</b>       |            |



## LIST OF FIGURES

|   |    |
|---|----|
| <b>Fig. 1.1.</b> Caribou distribution and range names in Alberta. WSAR=West side of Athabasca River; ESAR=East side of Athabasca River; CLAWR=Cold Lake Air Weapons Range. The triangles are observations of caribou from several sources and the dots are telemetry points (adapted from Dzus 2001).....   | 2  |
| <b>Fig. 1.2.</b> History of caribou standing committees in Northern Alberta (Boreal Caribou Committee 1999) .....   | 7  |
| <b>Fig. 1.3.</b> Organizational structure of the Boreal Caribou Committee (adapted from Boreal Caribou Committee 1999). .....   | 8  |
| <b>Fig. 1.4.</b> MDP document organization.....   | 11 |
| <b>Fig. 2.1.</b> Continuum of citizen involvement (Matthews and Gates 2000). .....  | 16 |
| <b>Fig. 2.2.</b> Solutions achieved via interest based dispute resolution.....  | 23 |
| <b>Fig. 2.3.</b> The success of the interest based vs. the position based dispute resolution approaches lies in including a greater number of interests in a solution.....  | 23 |
| <b>Fig. 4.1.</b> Woodland caribou management zones (shaded areas) based on the identification of suitable habitat and/or current caribou distribution in Alberta. NW=Northwest management zone guidelines, NE=Northeast management zone guidelines, RE=Red Earth management zone guidelines, SL=Slave Lake management zone guidelines (adapted from Dzus 2001). ..... | 62 |
| <b>Fig. 4.2.</b> Scenario #1 - No development in caribou ranges in northern Alberta.....  | 71 |
| <b>Fig. 4.3.</b> Scenario #2 – Unlimited industrial activity throughout caribou range. Small triangles represent wellsites and cutblocks; lines represent linear corridors. ....  | 72 |
| <b>Fig. 4.4.</b> Scenario #3 – Total protection of some ranges while allowing unlimited industrial activity on others.....  | 74 |
| <b>Fig. 4.5.</b> Scenario #4 – Rotation of industrial activity through range. ....  | 75 |
| <b>Fig. 4.6.</b> Scenario #5 – Limited industrial activity throughout caribou range. ....   | 76 |

## LIST OF TABLES

|  |    |
|--|----|
| <b>Table 2.1.</b> Elements of collaborative environmental decision-making (Randolph and Bauer 1999). ....  | 20 |
| <b>Table 2.2.</b> Prerequisites for, and barriers to, successful collaborative environmental decision-making (adapted from Randolph and Bauer 1999). ....  | 20 |
| <b>Table 3.1.</b> Government departments, industry sectors, and scientists involved in the BCC Guidelines Subcommittee, participant observation, and key informant interviews.....   | 31 |
| <b>Table 4.1.</b> Government departments, industry sectors, and scientists involved in the BCC Guidelines Subcommittee, participant observation, key informant interviews, and questionnaire.....  | 58 |
| <b>Table 4.2.</b> Participants’ responses to the potential of the proposed guidelines to address the recovery of existing disturbances on caribou range. ....  | 67 |
| <b>Table 4.3.</b> Participants’ responses to the potential of the proposed guidelines to manage new development in caribou range. ....   | 68 |
| <b>Table 4.4.</b> Participants’ responses to the potential of the proposed guidelines to plan and co-ordinate activity and manage the amount, spatial extent, distribution, and timing of industrial activity within caribou range. .... | 68 |
| <b>Table 4.5.</b> Participants’ responses regarding the comparison of the proposed consolidated guidelines with existing regional guidelines.....  | 70 |

## CHAPTER 1

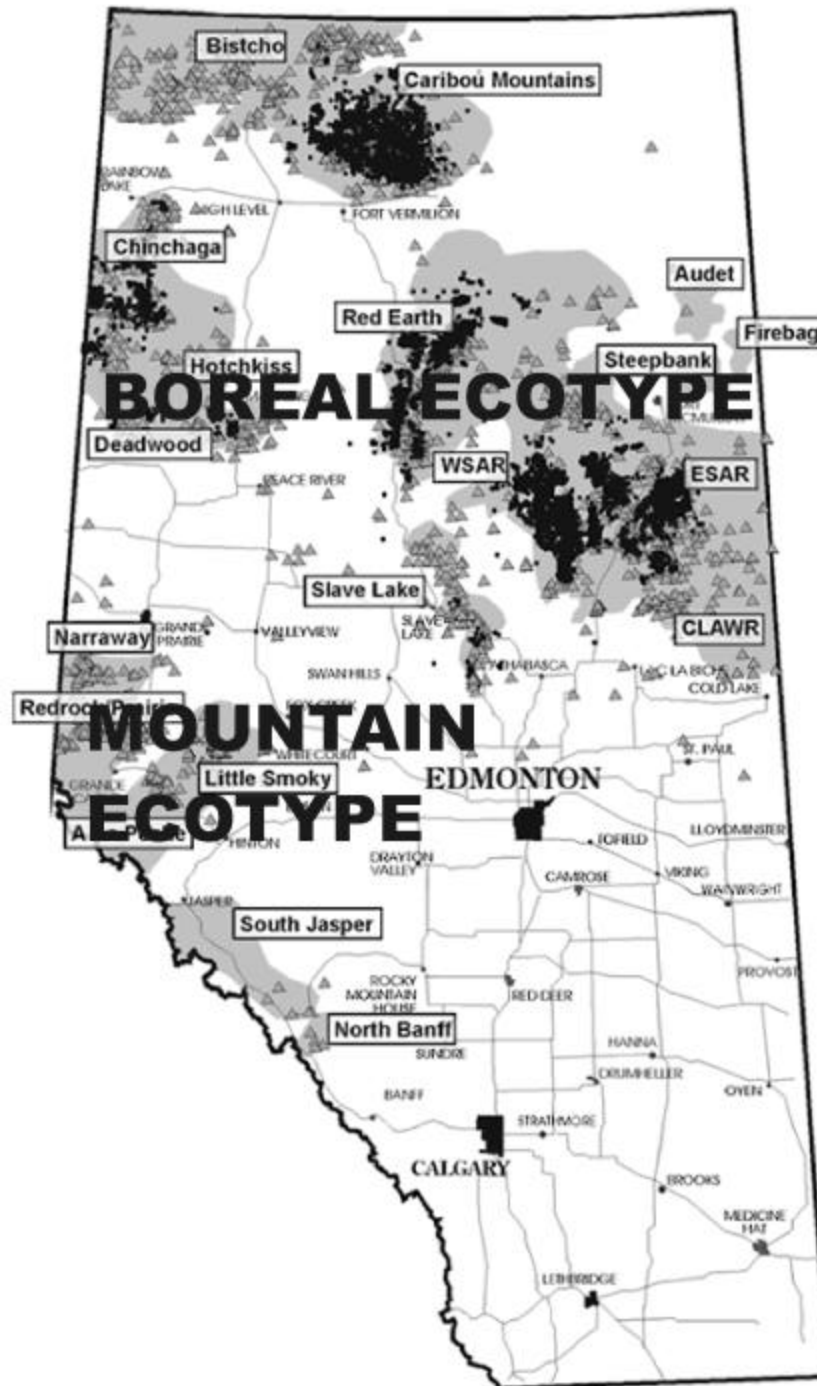
### 1.1 STATUS OF WOODLAND CARIBOU

The North American range of woodland caribou (*Rangifer tarandus caribou*) includes a Northern Mountain population in southern Yukon and northern British Columbia; a Southern Mountain population along the cordillera to the United States (U.S.) border; a Boreal population from the MacKenzie Valley through boreal parts of Alberta, Saskatchewan, Manitoba, Ontario, Quebec, and Labrador to Newfoundland; and a Gaspesie population (Gray 1999). The distribution and abundance of woodland caribou in North America has receded northward since the early 1900s throughout the Canadian provinces and the U.S. (Soper 1964, Bergerud 1974, Hristienko 1985, Trottier 1987, Cumming and Beange 1993). Historically, the southern limit of woodland caribou distribution ranged over much of the northern tier (Maine, Minnesota, Michigan, New Hampshire, Vermont, and Wisconsin) of the U.S. (Compton et al. 1995). By the early 1980s, their U.S. distribution had been reduced to a small herd of 25-30 animals inhabiting the Selkirk Mountains of northern Idaho and northeastern Washington (Compton et al. 1995).

The distribution of woodland caribou in Alberta has experienced a reduction in extent relative to its historic range (Dzus 2001). A detailed description of historic woodland caribou distribution in northern Alberta has not been documented. However, Soper (1964) and Edmonds (1988) documented reduction in caribou numbers and range throughout west central and northern Alberta. The combination of data from habitat use, radio telemetry studies, incidental sightings, and local knowledge, has resulted in a more comprehensive description of woodland caribou in Alberta (Figure 1.1).

There is inconclusive data on historical and current population size and trend of woodland caribou in Alberta, but wildlife managers have perceived a decline over the past century (Dwyer 1969, Bloomfield 1980, Edmonds 1986). Current woodland caribou population estimates are consistently much less than 1000 caribou for all identified

caribou ranges in Alberta (Alberta Fish and Wildlife 1993). Woodland Caribou populations in most boreal and mountain ranges in Alberta are currently declining (Dzus 2001).



**Fig. 1.1.** Caribou distribution and range names in Alberta. WSAR=West side of Athabasca River; ESAR=East side of Athabasca River; CLAWR=Cold Lake Air Weapons Range. The triangles are observations of caribou from several sources and the dots are telemetry points (adapted from Dzus 2001).

In Alberta there are two ecotypes of woodland caribou that differ primarily in their habitat use (Figure 1.1). The mountain ecotype of west central Alberta undertakes migrations between its forested foothills winter range and mountainous spring calving and summer range (Alberta Environmental Protection 1998). The boreal ecotype inhabits fens, muskegs and jack pine or lodgepole pine habitats of the boreal forest, and herds are non-migratory. Woodland caribou discussed in this document refer to the boreal ecotype only.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) currently designates the woodland caribou in Alberta (Boreal population) as ‘threatened’ (COSEWIC 2000). Woodland caribou are on Alberta’s Blue List of species that may be at risk of declining to non-viable population levels in the province (Alberta Wildlife Management Division 1996) and are designated as ‘threatened’ under the Alberta Wildlife Act (Alberta Environmental Protection 1998) .

## **1.2 CAUSES FOR WOODLAND CARIBOU DECLINE**

Rapid encroachment on woodland caribou habitat by resource extraction industries (e.g., oil, gas, forestry, and peat) is occurring throughout northern Alberta (Alberta Environmental Protection 1998, Dyer 1999). Woodland caribou are vulnerable to the magnitude of environmental changes associated with agricultural, urban, and industrial development (Alberta Environmental Protection 1998).

Woodland caribou, which naturally exist at a low density, have a large home range, and have highly variable calf mortality rates, cannot recover from the effects of many disturbances as quickly as other ungulates that naturally maintain higher population densities (Dzus 2001). Interactions between predation and other factors such as habitat alteration (e.g., timber harvesting, peat harvesting, and linear corridors) and human activity (e.g., industrial or recreational use of linear corridors) are complex and constantly affecting woodland caribou populations in Alberta (Alberta Environmental Protection 1998).

Increases in the number of linear corridors such as roads, pipelines, and seismic lines can harm caribou populations directly by increasing caribou mortality from vehicle collisions and increased hunting (Alberta Environmental Protection 1998). Anthropogenic features such as roads and seismic lines may provide wolves with easy access into caribou habitat that would not have previously been used (Stuart-Smith et al. 1997, James 1999). This increased access to lowland habitat has been hypothesized to increase the encounter rate between wolves and caribou (James 1999).

Timber harvesting of upland areas adjacent to lowland peatland complexes occupied by caribou may also increase predation pressure on caribou. Habitat alteration may facilitate increased predation on woodland caribou by providing habitat for other prey species (e.g., moose and deer) that, in turn, support a higher density of predators (Cumming 1992, Seip 1992, Rettie & Messier 2000). Mortality among caribou calves is very high and increased wolf predation could be sufficient to initiate a decline in a herd (Bergerud 1974, Bloomfield 1980, Gasaway et al. 1983, Hristienko 1985, Bergerud and Ballard 1988, Seip 1992, Rettie and Messier 1998, James 1999).

Loud noise can significantly increase a caribou's rate of movement and result in higher energy expenditure (Bradshaw et al. 1997). Disturbed caribou may switch to less suitable habitat in response to disturbance (Bradshaw et al. 1998). Switching habitats may lead to periods of sub-optimal foraging for females in late pregnancy. During such winters, Bradshaw (1994) hypothesized that the energetic effects of multiple perturbation encounters may contribute to increased calf mortality. The birth weight and subsequent survival of calves is correlated with the weight of the mother in late pregnancy (Adams 1996). Low birth weight calves may be at a much higher predation risk than stronger calves that are able to move more easily following birth. Calves with lighter post-partum and early-summer weights are less likely to survive their first winter (Adams 1996).

Dyer (1999) examined the movement and distribution of woodland caribou in response to industrial development in northeastern Alberta. The results from this study report that

maximum avoidance distances were 1000 m from well sites and 250 m from roads and seismic lines. The greatest avoidance distances were generally reported during late winter (when human activity was highest in the study area) and the lowest avoidance distances corresponded to periods of low human activity in the study area (Dyer 1999). Using conservative estimates of the spatial distribution of linear corridors in several northern caribou ranges, Dzus (2001) extrapolated the potential area of reduced caribou use relative to human developments. Based on an area of 250 m, the percentage of habitat affected in several northern Alberta caribou ranges varies from 28% to 70% of total range area (Dzus 2001).

### **1.3 WOODLAND CARIBOU MANAGEMENT IN ALBERTA**

By the late 1980s, commitments of forested lands to timber harvesting combined with oil and gas exploration and development led to increased concern over woodland caribou population and habitat in Alberta. The perceived decline in woodland caribou numbers in Alberta resulted in closure of recreational hunting in 1981 (Edmonds 1986). In 1986, caribou were placed on the endangered species list of the Alberta Wildlife Act (Alberta Environmental Protection 1998). The ‘Woodland Caribou Provincial Restoration Plan’ (Edmonds 1986) and the ‘Strategy for Conservation of Woodland Caribou in Alberta’ (Alberta Fish and Wildlife 1993) were drafted by the provincial wildlife management agency but few recommendations from these reports were adopted (Dzus 2001). In 1996 another provincial woodland caribou conservation strategy was developed (Alberta Woodland Caribou Conservation Strategy Development Committee 1996). The goal was to develop a strategy that would result in healthy caribou populations throughout Alberta’s caribou range including the removal of woodland caribou from Alberta’s endangered species list, and eventual restoration of a licensed hunting season (Dzus 2001). The government of Alberta has not yet approved this strategy.

By the winter of 1990/1991, concern that the cumulative effects of continued industrial incursion into the caribou’s core range was affecting the long-term viability of the species led to the government’s implementation of land-use guidelines for industrial activity in

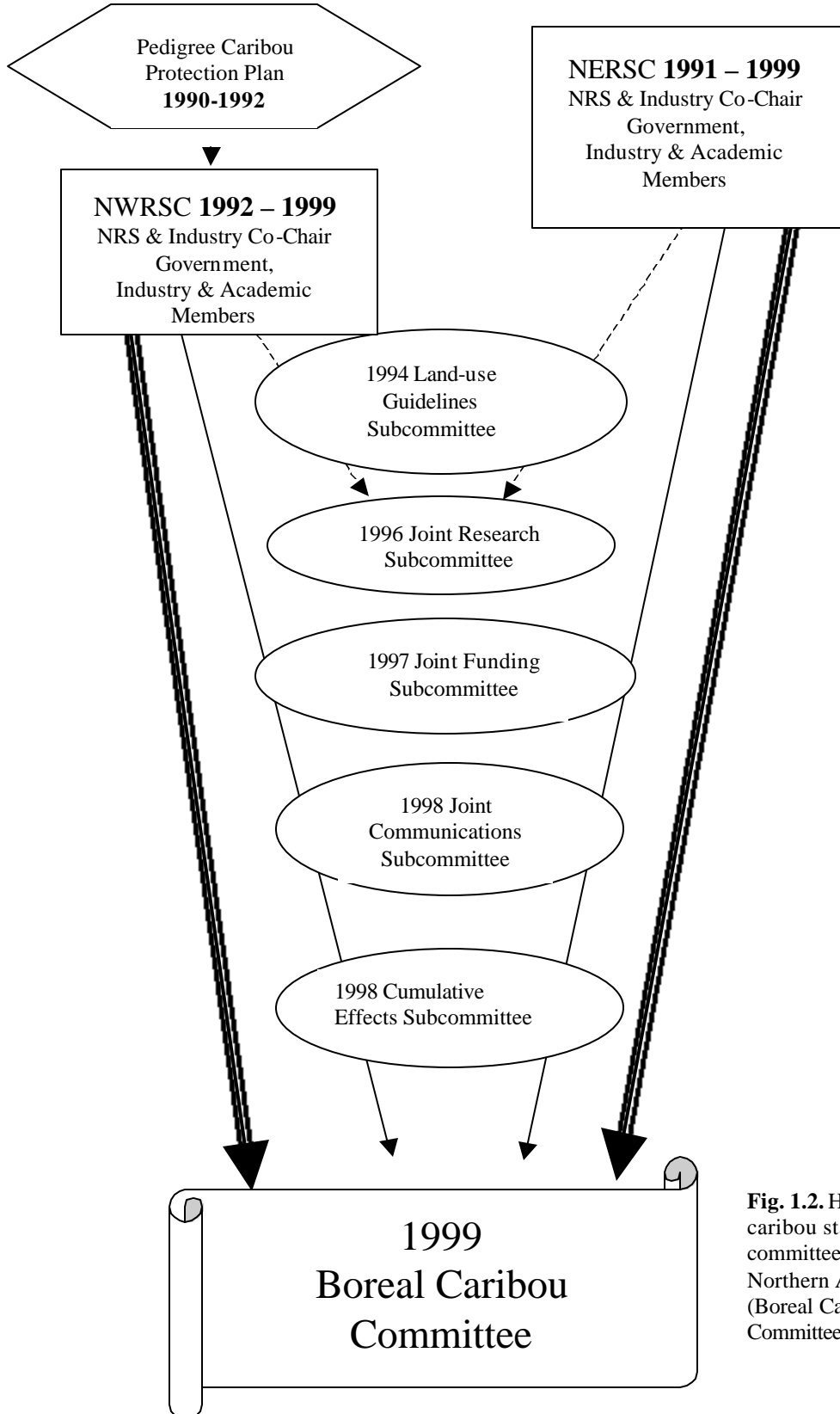
caribou range in northeastern Alberta. The land-use guidelines attempted to minimize the risk of exposure of caribou to industrial disturbance, minimize caribou habitat change or loss, and address concerns regarding increased public access to caribou ranges (Edey et al. 1998). Industrial operators found the guidelines difficult to work with and significant conflicts resulted between individual companies and government land and wildlife managers (Edey et al. 1998). In 1991 the government of Alberta prepared Information Letter (IL) 91-17 to provide a procedural guide for oil and gas activity on caribou range. This was “the first step towards a multi-sectoral, integrated approach to manage woodland caribou in Alberta” (Alberta Energy 1991). It recommended cooperation between government and industry and the establishment of Standing Committees for areas of the province with caribou ranges and industrial activity. Membership for each Standing Committee included representatives from industry sectors that operated in caribou range and the following government departments:

- Alberta Forest Service (currently the Alberta Land and Forest Service);
- Alberta Fish and Wildlife (currently Natural Resources Service),
- Energy Resources Conservation Board (currently the Alberta Energy and Utilities Board); and
- Alberta Energy (currently Alberta Resource Development).

The purpose of the Standing Committees was to foster cooperation, share information and advice on the level of protection required for the caribou, and to develop area-specific mitigation plans (Alberta Energy 1991). If coordination and decision-making were enhanced, representatives with broader industry interests may be included on these Standing Committees (Alberta Energy 1991).

In response to IL-91-17, the Northeast Region Standing Committee on Woodland Caribou (NERSC) was initiated in mid-1991. A similar partnership, the Northwest Region Standing Committee on Woodland Caribou (NWRSCC), was established in northwestern Alberta in 1994. The Boreal Caribou Committee (BCC; 1999) resulted

from the merger of the Northeast (NERSC; 1991-1999) and Northwest (NWRSCC; 1992-1999) Regional Standing Committees on Woodland Caribou (Figure 1.2).

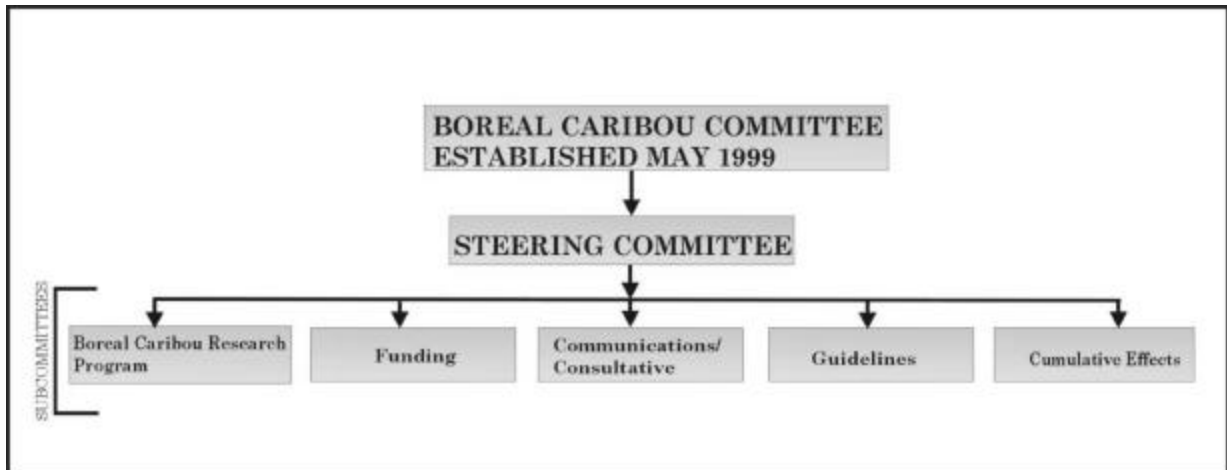


**Fig. 1.2.** History of caribou standing committees in Northern Alberta (Boreal Caribou Committee 1999).



The BCC consists of one steering committee and five subcommittees (Figure 1.3). The mandate of the Steering Committee is to co-ordinate BCC activities and to serve as a liaison between BCC and senior levels of government and industry. Representation on the Steering Committee is as follows:

- Natural Resources Service (NRS; formerly Fish and Wildlife) – 2 (one from Northwest Boreal region [NWB] and one from Northeast Boreal Region [NEB])
- Land and Forest Service (LFS) – 2 (one from NWB and one from NEB)
- Oil & Gas Industry – 2
- Timber Industry – 2



**Fig. 1.3.** Organizational structure of the Boreal Caribou Committee (adapted from Boreal Caribou Committee 1999).

The BCC represents industrial users and provincial government land and wildlife managers, supporting a multi-stakeholder forum to discuss complex ecological challenges involved in resource development and the conservation of woodland caribou. The goal is to integrate industrial activities in northern Alberta with the management and conservation of caribou and caribou habitat (Boreal Caribou Committee 1999).

## **1.4 ISSUES**

Stakeholders are those effecting change in the environment and those who perceive they may be affected by it (Randolph and Bauer 1999). The BCC currently involves a restricted range of stakeholders. The BCC did not include direct involvement from First Nation groups, environmental groups, and local organizations such as recreationalists, trappers, local businesses and municipal governments. Decisions that do not include all stakeholders may not be holistic, i.e. inclusive of all interests and all relevant types of knowledge (Randolph and Bauer 1999).

Recent research on the effects of industrial development on caribou has provided relevant new information to help achieve knowledge-based management of caribou populations in Alberta. As per the goals of the BCC, the Guidelines Subcommittee was directed to review and revise land-use guidelines so that this newly acquired knowledge could be reflected in management of industrial activity (Boreal Caribou Research Program 2000). The expectations of the Guidelines Subcommittee were the following (Boreal Caribou Committee Guidelines Subcommittee 1999):

- Review existing regional industrial operating guidelines from across northern Alberta and draft a set of consolidated guidelines for implementation on designated northern Alberta caribou ranges;
- Ensure consolidated guidelines reflected accumulated knowledge from research program; and
- Address cumulative effects in the development, application, and evaluation of the consolidated guidelines.

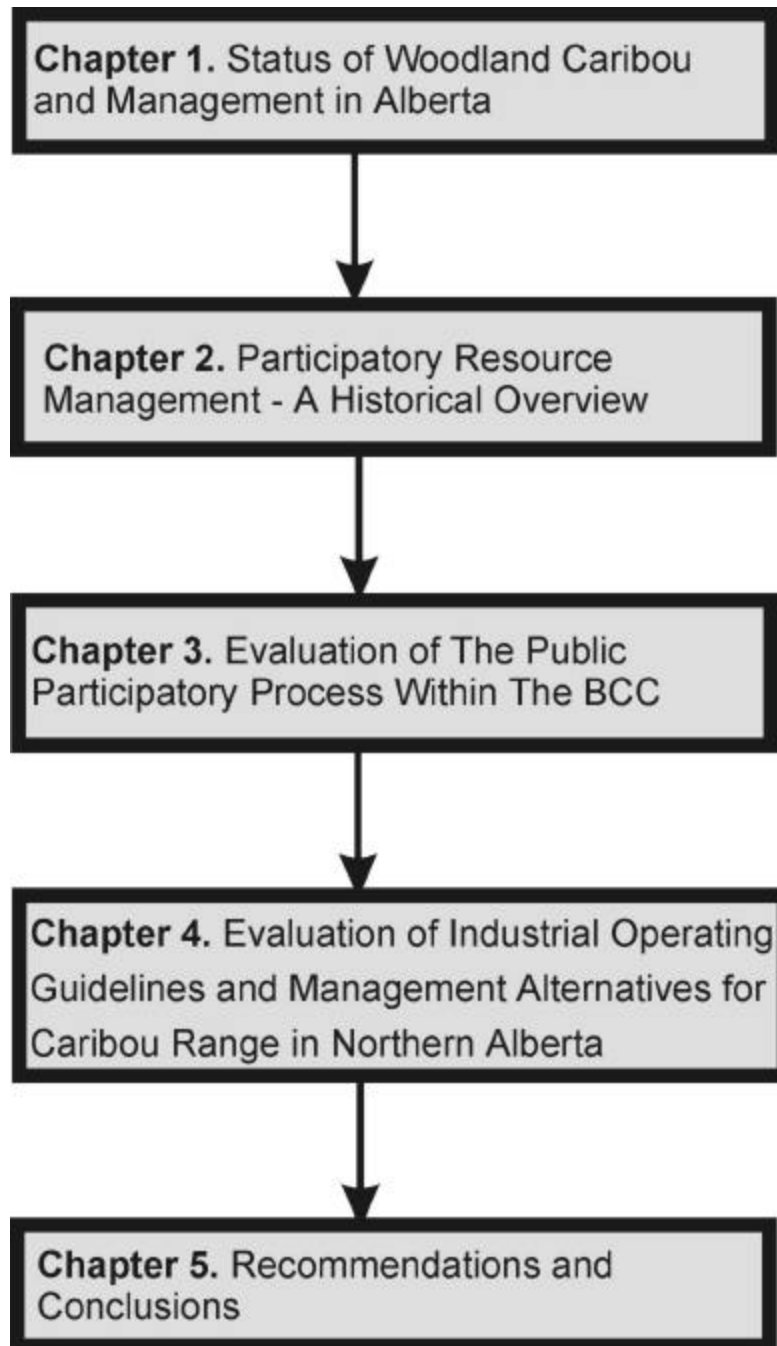
## **1.5 PURPOSE**

The purpose of this Master's Degree Project (MDP) was to evaluate the participatory nature of the BCC in relation to a published framework for evaluating public participatory processes (Beierle 1999). I explored the characteristics of the BCC that

were both supportive to or were barriers to the collaborative process. Then, I facilitated an evaluation of the proposed consolidated industrial operating guidelines for caribou conservation in the Boreal Forest Natural Region of Alberta by the BCC Guidelines Subcommittee. The evaluation considered the potential of the proposed consolidated guidelines to reduce the cumulative effects of existing and new developments in caribou range in comparison with existing regional guidelines. Possible future alternatives for management of industrial activities in caribou range were also considered.

## **1.6 APPROACH**

I first reviewed the nature of concerns about caribou conservation in Alberta and management actions undertaken to reduce the effects of industrial development (Figure 1.4). Next, I reviewed the theory and history of public participatory resource management (Chapter 2). I then evaluated the participatory nature of the BCC using participatory observation, key informant interviews and a published framework for evaluating participatory processes (Chapter 3). Participant observation, a questionnaire and key informant interviews were used to evaluate the proposed consolidated industrial operating guidelines and possible future management alternatives for industrial activity in caribou range in northern Alberta (Chapter 4). Finally, I provided a summary of key recommendations for the improvement of public participation within the BCC and its proposed industrial operating guidelines for caribou range (Chapter 5).



**Fig. 1.4.** MDP document organization.

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## CHAPTER 2

### 2.1 INTRODUCTION

Public involvement in wildlife management and the government's role in representing the public have changed through history. Roman law deemed that wild animals, which never had an owner, could become the property of the first person to control or occupy them (*res nullius*). The right belonged to individuals and therefore it was a personal right (Tilleman 1995). Historic common law in England also allocated the rights to hunt or own wild animals to the individual based on the principles of *ratione soli* and *ratione privilegii*. *Ratione soli* allowed individuals to kill or take wild animals caught on private land. *Ratione privilegii* justified the killing or capturing of wild game by holding certain privileges granted by the crown. These early laws and principles held that property rights were qualified with wild animals because the animals, being wild, could leave (Tilleman 1995). When the animal left, so did the transient property right. Today, the wildlife resource belongs to all people. Wildlife in North America is *de facto* and *de jure* - a public resource (Geist 1995). The government of the state, representing the public, is the administrator and distributes possession and control of wildlife rights.

### 2.2 PUBLIC PARTICIPATION IN RESOURCE MANAGEMENT

Governments, representing the public, have used a range of approaches to wildlife management decision-making. More democratic approaches have emerged in response to increasingly complex environmental problems, constrained government budgets, and recent trends towards deregulation (Randolph and Bauer 1999). These approaches have varied in degree and form (Figure 2.1).



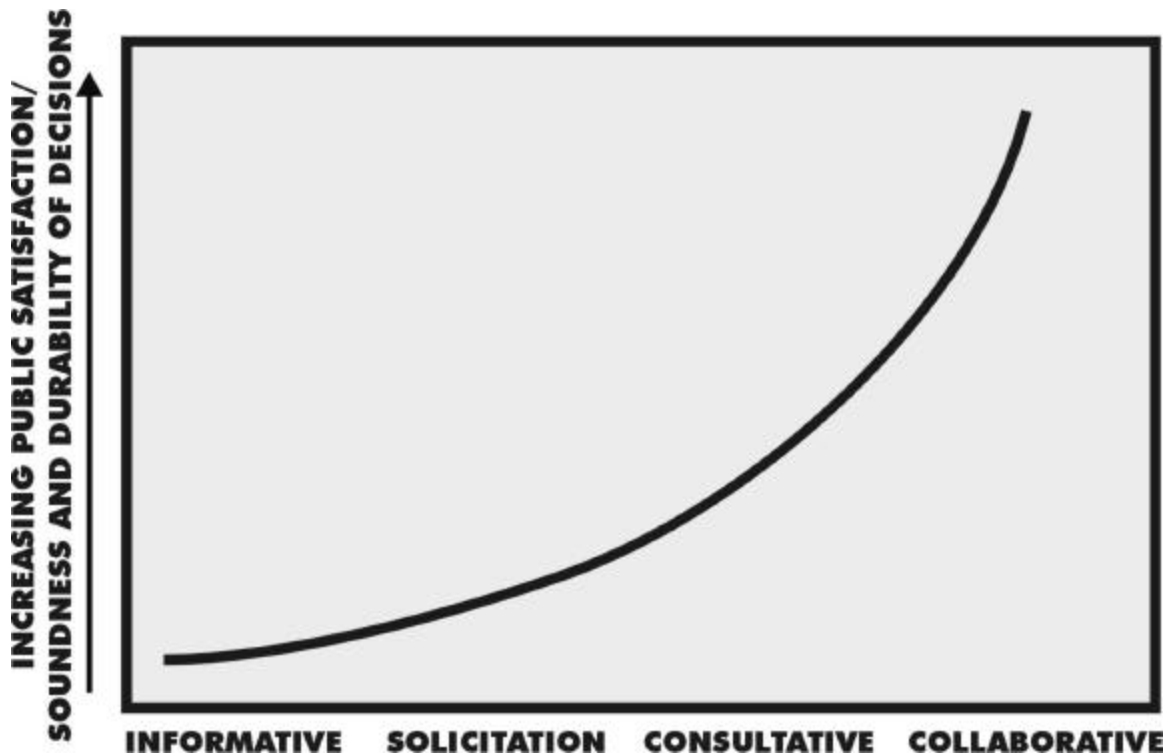


Fig. 2.1. Continuum of citizen involvement (Matthews and Gates 2000).

Arnstein (1969), Berkes (1994), and Decker et al. (1996) described the degrees or levels of public involvement. In the **informative** approach (Figure 2.1), the public is informed of decisions made by an agency or government department. The emphasis is placed on a one-way flow of information, from officials to citizens, with no channel provided for feedback and no power of negotiation. Instruments such as public announcements, mail outs or news releases may be used to inform the public. With **solicitation**, an agency actively solicits opinions or information from the public sector and considers this information when making a decision. Surveys, hearings and focus groups may be used to solicit public input. In the **consultative** approach to public involvement an agency solicits input and promotes active dialog. However, this approach offers no assurance that citizen concerns, values, and ideas will be taken into account. Consensus is not part of the decision-making process in the consultative approach. Advisory committees and task forces are commonly used for this purpose. Finally, in the **collaborative** approach to public involvement an agency or government department is a participant in the decision-making process along with other participants representing a range of interests (DeHaven and Wodraska 1996, Creighton 1999, Margerum 1999, Randolph and Bauer 1999). All

participants are equal in a collaborative process and consensus is a requirement (DeHaven and Wodraska 1996).

Briand (1998) explained that prior to the 1970s, individual citizens often accepted the paternalism of government that offered seemingly unconditional support (informative approach) (Figure 2.1). In a “consumerist society” the public did not think of themselves as citizens but as consumers of what the government could deliver. Society expected the government to do things for them and saw their own role as confined to alerting public officials to their desires, making known their opinions, and advocating actions and policies they believed would benefit them. Within this paradigm citizens did not discuss motivations for their opinions nor did they collaborate on management decisions. Citizen involvement in wildlife management issues was achieved through public activism or litigation.

The 1977 Mackenzie Valley Pipeline Inquiry headed by Justice Berger provided a forum for inhabitants of northern Canada to express their views on the proposed pipeline and established the royal commission as a useful public input mechanism (VanNijnatten 1999). The inquiry was regarded as being instrumental in changing how public participation was viewed, elevating it to an effective and official form of involvement in the decision-making process (VanNijnatten 1999). This was an important step towards consultative participation. The growth of non-government public interest groups and increasing use of environmental negotiation and alternative dispute resolution, as opposed to litigation, allowed for increased public involvement and communication in resolution of environmental issues (Randolph and Bauer 1999). There was recognition that public participation must be balanced and integrated with the other important aspects of the environmental decision-making process, such as scientific evaluations, environmental conditions of the system of interest and the regulatory context (Beierle 1999).

During the 1980s, federal and provincial governments began experimenting with new forms of participatory decision-making. One such form was a mechanism referred to as

multi-stakeholder consultation (MSC). This mechanism gathered interested parties together (e.g., different government departments and industry) to facilitate consensus on balancing environmental and economic requirements (VanNijnatten 1999). The objective of MSC was shared policymaking through information transfer, discussion and trade-offs among parties committed to a longer-term process guided by government (VanNijnatten 1999).

The need for consensus-building processes in natural resource management continues to grow today (DeHaven and Wodraska 1996). Wildlife resources are beginning to be managed collaboratively rather than individually so that ecosystems can be protected as a whole (DeHaven and Wodraska 1996). Collaborative approaches invoke concepts of participatory democracy, using civic dialogue to reach decisions (Dryzek 1990). The goal of the process is to reach decisions that can be supported by all of the stakeholders involved and still reflect scientific principles along with local or traditional knowledge.

Various stakeholders involved in an environmental issue bring different values, positions, and interests to the table. These attributes are often very diverse and make problem resolution complex. Environmental decision-making involves professionals, politicians and the public. These parties may produce alternative solutions to a problem that reflect a spectrum of interests from economic development to environmental protection (Randolph and Bauer 1999). A decision-making body or process is then expected to resolve the conflicting alternatives in a manner that satisfies the needs of society while still protecting the environment (Randolph and Bauer 1999).

Conflicts with complex and competing interests are not managed well through strict technological or economic solutions. These solutions often fail to take non-economic environmental values into account (Randolph and Bauer 1999). Facts are separated from values on the basis that values fall into the political realm and have no place in objective decision-making (Randolph and Bauer 1999). However, the rationality and objectivism contained within science and technology tend to eliminate meaningful aspects of human association (Randolph and Bauer 1999). It is also important to note that science and

economics are not devoid of values, they are social constructs and reflect cultural interests (Morrow 1994).

Collaborative-based environmental decisions should reflect the character of a society. People express attitudes about the environment in economic, ethical, and aesthetic terms that are heavily value laden (Caldwell and Shrader-Frechette 1993). There is also an emerging realization that lay people and technical experts bring valid but very different perspectives to decision-making regarding risks. Even the more technical tools in environmental decision-making, risk assessment and cost-benefit analysis, require significant subjective judgments that are most appropriately made with an input of public values (Beierle 1999). Thus environmental solutions should not be limited to technical or scientific answers.

In my opinion, to reach effective environmental decisions that are acceptable to diverse interests, the typical categorizing of parties or groups must be changed. One must not fall into the trap of quickly categorizing people as an “environmentalist”, “regulator”, or an “industrialist”. For effective collaborative participation, an emphasis must be placed on maintaining a dialogue between all parties that stresses similarities and promotes a shared vision for the future (Selin and Chavez 1995).

Decisions that include all stakeholders are knowledge-based and holistic, and are created by stakeholder groups that share power and responsibility; such decisions are a result of an effective collaborative environmental decision-making process (Table 2.1).

**Table 2.1.** Elements of collaborative environmental decision-making (Randolph and Bauer 1999).

|                                     |   |
|-------------------------------------|---|
| <b>Stakeholder Involvement</b>      | Early engagement of stakeholders in the process of planning and implementation. Stakeholders are those effecting change in the environment and those who perceive they may be affected by it. |
| <b>Knowledge Based</b>              | Information exchange by all process participants.   |
| <b>Holistic, Proactive Approach</b> | Holistic understanding of environmental problems and proactive efforts to resolve and prevent them.   |
| <b>Sharing of Power</b>             | Parties in authoritative positions relinquish control to all participants.  |
| <b>Joint Responsibility</b>         | All participants share credit for success and acknowledgements of failure.  |
| <b>Integrated Solutions</b>         | Integration of a wide range of creative solutions to problems (e.g., flexible regulation, economic incentives, voluntary actions, educational programs).                                      |

All possible interests should be involved in the decision-making process. Excluding an interest can undermine the whole process (Randolph and Bauer 1999). The process works best when well structured with a clear schedule, explicit milestones and the use of small working groups (Randolph and Bauer 1999). To achieve effective collaboration, a number of conditions such as good information, commitment of participants' time and resources, and participants' openness to new information and perspectives are essential throughout the process (Table 2.2).

**Table 2.2.** Prerequisites for, and barriers to, successful collaborative environmental decision-making (adapted from Randolph and Bauer 1999).

| <b>Prerequisites for Collaboration</b>  | <b>Barriers to Collaboration</b>  |
|---|---|
| Reliable information and exchange of all relevant information.  | Misleading information or lack of trust so that information cannot be freely exchanged.                               |
| Time to participate, to build trust, to learn, to resolve disputes and to create innovative solutions.  | No time for participants to build trust, learn from each other, resolve disputes or think about innovative solutions. |
| Willingness to learn from each other.   | High level of advocacy and entrenched positions.  |
| Responsibility to affect and implement decisions.   | No responsibility given to stakeholders.  |
| Facilitator or chairperson that keeps all participants focused on terms of reference for the committee. | Committee is unclear of terms of reference and are not focused on issues that need to be addressed.                   |

Examples of some wildlife management committees that have used a collaborative decision-making process include: a deer management committee in Cayuga Heights, New York (Chase et al. 1999), Creamer's Field Migratory Waterfowl Refuge Management Committee (Alaska Department of Fish and Game 1993), Rocky Mountain Elk Foundation (Chase et al. 1999) and the Montana Department of Fish, Wildlife and Parks (Guynn and Landry 1997).

## **2.3 DISPUTE RESOLUTION IN PUBLIC RESOURCE MANAGEMENT**

Any method of negotiation should produce a wise agreement, be efficient and improve the relationship between participants (Fisher et. al. 1991). A wise agreement is one that meets the legitimate interests of participants, resolves conflicting interests fairly and is durable (Fisher et. al. 1991). Disputes or conflicts that arise during the decision-making process can be addressed in a variety of ways. Collective bargaining, mediation and some forms of arbitration are examples of power-based approaches in which positional negotiation based on compromise is used (Fredericksen 1996). This produces win-lose solutions in which one party can gain only at the expense of another party (Fisher et. al. 1991). Positional negotiation using the power-based approach fails to meet the basic criteria of producing a wise agreement (Fisher et. al. 1991). Positional negotiation involving many participants is time consuming and pays no attention to the underlying interests of the participants (Fisher et. al. 1991).

**Interest-based negotiation** is an alternative to traditional methods of conflict resolution. Parties in potential conflict work collaboratively with each other in a structured or facilitated setting to solve problems (Fredericksen 1996, Fisher et. al. 1991). The principles of interest-based negotiations include: separating the people from the problem; focusing on interests, not positions; inventing options for mutual gains; and using objective criteria (Fisher et. al. 1991, Barnes 1996).

### **2.3.1 Separating the People From the Problem**

The focus of conflict resolution should be defining the problems, not on the people who represent a problem (Leritz 1987, Barnes 1996). Negotiation should be based on accurate perceptions, clear communication, appropriate emotions and a purposeful outlook (Fisher et al. 1991, Ury 1991). Participants must be able to see the situation as the other side sees it. This technique reduces conflict and advances awareness of participants' interests (Fisher et. al. 1991).

If strong emotions prevent the problem from being discussed constructively, it may be advisable to use a third party to act as a mediator (Fisher et. al. 1991, Barnes 1996). The mediator can: act as a discussion leader, ensuring all parties have equal opportunities to speak; help distinguish interests from positions; help devise creative solutions that meet each party's needs; and help to build trust among parties (Barnes 1996).

### **2.3.2 Focusing on Interests, Not Positions**

Interest-based negotiation focuses on interests rather than positions and seeks to discover the motivations behind each party's positions (Kennedy 1999). Fisher et al. (1991) describe the differences between positions and interests. A position is one solution to a party's needs or a party's desired outcome. Positions are often expressed as "I will..." or "I must have...". They are a specific basis of a conflict supported by a person's interests. Interests are subject matter or component parts of a party's position. Interests are a collection of needs a person would like to have met. They consist of underlying attitudes and feelings that a party has with respect to any given issue. Reconciling interests rather than positions in dispute resolution works because behind opposed positions are shared and compatible interests (Fisher et. al. 1991).

The key to interest-based negotiations is to shift away from positions to specific interests (Figures 2.2 and 2.3). For example, an interest for a timber company may be to harvest a certain amount of timber from an area in a certain amount of time. A position for this timber company may be that they must have a certain density of roads in an area to extract the timber. Using the interest-based approach participants find common ground by discovering underlying interests, and then work to craft solutions to meet their most important interests (Figures 2.2 and 2.3). For example, upon using interest-based negotiations with stakeholders involved in the BCC Guidelines Subcommittee, this timber company may be able to share its access with other companies or industrial sectors that are in the same area and may be able to design an access pattern that will have the smallest impact on caribou habitat while still allowing for extraction of the timber.

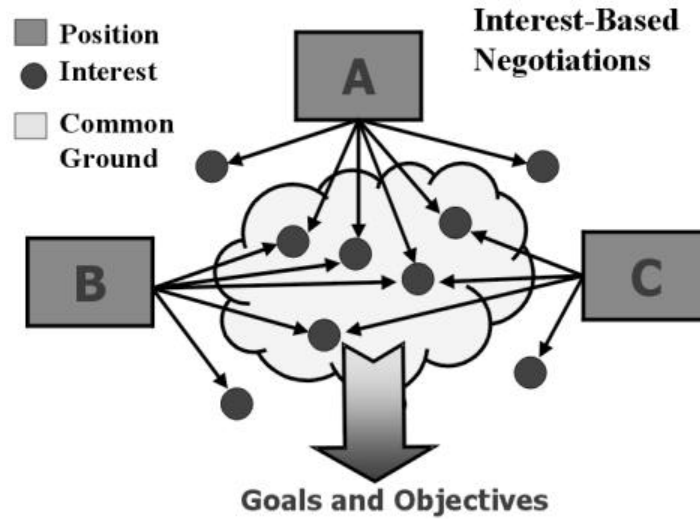


Fig. 2.2. Solutions achieved via interest based dispute resolution.

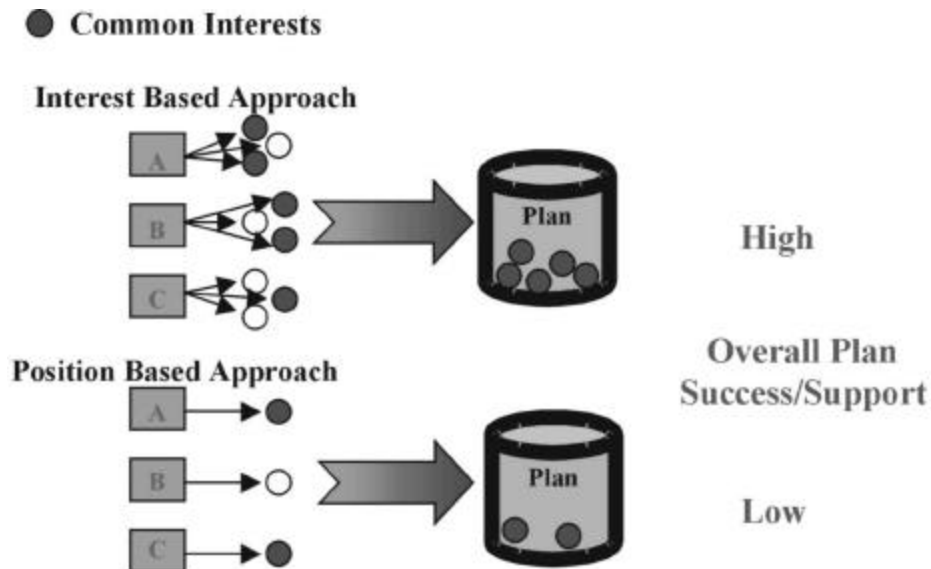


Fig. 2.3. The success of the interest based vs. the position based dispute resolution approaches lies in including a greater number of interests in a solution.

### 2.3.3 Inventing Mutual Options for Mutual Gains

Most participants in a power or rights-based negotiation will look for the single best answer from the outset (Barnes 1996). With the interest-based approach, brainstorming can produce as many alternatives to solve the problem at hand (Fisher et. al. 1991, Fredericksen 1996). Criticism and evaluation of ideas can occur later in the process (Barnes 1996). Discussing options developed through brainstorming is an improvement



from taking positions (Fisher et. al. 1991). Another misconception about creative problem-solving is that if one option benefits one party, another party will not benefit (Fisher et. al. 1991). Often solutions can be found that benefit all parties involved (Barnes 1996).

#### **2.3.4 Using Objective Criteria**

Choosing objective criteria for resolving conflicts provides a fair, unbiased method for evaluating options developed through the brainstorming process (Barnes 1996). The criteria may consist of a model that is able to forecast the consequences of choosing different options. Such criteria will help participants reach a wise agreement (Fisher et al. 1991). For example, such a model may rate the current state of caribou habitat, track habitat changes and disturbances, and incorporate the recovery of disturbances over time. This model would provide the opportunity to explore the benefits of various potential future land uses and industrial operating practices (i.e., options developed during brainstorming) to determine the most effective means for addressing caribou conservation issues.

In the next chapter, Chapter 3, I use the concepts of public participation and dispute resolution to examine a multi-stakeholder committee that is involved in the management of woodland caribou and human activities that affect them in northern Alberta. In particular, I examined the degree of public participation (i.e., informative, consultative or collaborative) within this committee and the dispute resolution processes (i.e., power-based or interest-based) that are used.

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## CHAPTER 3

### 3.1 INTRODUCTION

Woodland caribou distribution and abundance throughout North America has declined over the last 100 years in association with expansion of agriculture, urban and industrial development (Banfield 1961, Bergerud 1974, Edmonds 1986, Cumming and Beange 1993, Alberta Environmental Protection 1998, Rettie and Messier 1998). By the late 1980s, commitments of forested lands to timber harvesting combined with oil and gas exploration and development led to increasing concern over woodland caribou population and habitat in Alberta (Alberta Environmental Protection 1998).

Land-use guidelines attempted to minimize caribou habitat change or loss, minimize the risk of exposure of caribou to sensory disturbance from industrial activity and address concerns regarding increase in public access to caribou ranges (Edey et al. 1998). Industrial operators found the guidelines difficult to work with and significant conflicts resulted between individual companies and government land and wildlife managers (Edey et al. 1998). Government of Alberta Information Letter (IL) 91-17 was a procedural guide for oil and gas activity on caribou range and was “the first step towards a multi-sectoral, integrated approach to manage woodland caribou in Alberta” (Alberta Energy 1991). IL 91-17 recommended cooperation between government and industry and the establishment of Standing Committees for areas of the province with caribou ranges and industrial activity. The Information Letter also recommended membership for each Standing Committee to include companies operating in the area and Alberta Forest Service (currently named Alberta Land and Forest Service), Alberta Fish and Wildlife (currently named Natural Resources Service), Energy Resources Conservation Board (currently named Alberta Energy and Utilities Board), and Alberta Energy (currently named Alberta Resource Development). The purpose of the Standing Committees was to foster cooperation, share information and advice on the level of protection required for the caribou, and to develop area-specific mitigation plans (Alberta Energy 1991). If

coordination and decision-making could be enhanced, representatives with broader industry interests may be included on these Standing Committees (Alberta Energy 1991).

In response to IL-91-17, the Northeast Region Standing Committee on Woodland Caribou (NERSC) was initiated in mid-1991 and the Northwest Region Standing Committee on Woodland Caribou (NWRSCC) was established in northwestern Alberta in 1994. Participants included representatives from the Alberta government departments listed above, eighteen energy and utility companies, and one forest harvesting company (Edey et al. 1998).

The Boreal Caribou Committee (BCC; 1999) resulted from the merger of the Northeast (NERSC; 1991-1999) and Northwest (NWRSCC; 1992-1999) Regional Standing Committees on Woodland Caribou (Chapter 1). The BCC represents industrial users and provincial government land and wildlife managers, supporting a multi-stakeholder forum to discuss complex ecological challenges involved in resource development and the conservation of woodland caribou. However, the BCC has involved a restricted range of stakeholders. It does not include involvement from First Nation groups, environmental groups and local organizations such as recreationalists, trappers, local businesses and municipal governments.

The purpose of this chapter was to define the participatory nature of the BCC and its Guidelines Subcommittee and to evaluate it according to a framework for evaluating the public participatory process (Beierle 1999). I explored the characteristics of the BCC that were both supportive to or were barriers to the collaborative process (Chapter 2). I also assessed the dispute resolution techniques (Chapter 2) employed through the BCC Guidelines Subcommittee. Lastly, I provide recommendations for the improving the public participatory process within the BCC.

## **3.2 METHODS**

Participant observation and key informant interviews were two qualitative research methods used to determine the participatory nature of the BCC and its Guidelines Subcommittee.

### **3.2.1 Participant Observation**

Participant observation involved observing interactions between participants in the BCC and BCC Guidelines Subcommittee meetings. Observation occurred with the consensus of BCC members. The BCC meets twice a year and I attended three meetings over the course of two years. I participated with the BCC Guidelines Subcommittee since its inception in January 2000. The Subcommittee met 15 times from January to December 2000; I attended 14 of the 15 meetings. Through participation, I was able to observe and experience the meanings and interactions of people from the role of an insider. This was adequate time to gain acceptance by the group, to establish a working relationship with members of the Subcommittee and to understand their unique positions and concerns regarding the revision of industrial operating guidelines for caribou ranges in northern Alberta.

Direct observations of participants (e.g., what they said or how they reacted to what was said) and their interactions during the meetings were recorded. Information was also gathered from documents (e.g., emails, position papers, media articles, etc.) that were distributed and discussed during the meetings. Data recording and analysis followed the methodology described by Jorgenson (1989). A hand written log of the conversations and interactions between participants was kept for each meeting. The log was transcribed into an electronic file (Microsoft Word<sup>®</sup>). A separate file was established for each meeting. Information was coded according to sector (e.g., oil and gas, forestry, peat, Alberta government) and where possible, information from key informant interviews and questionnaires was compared with participant observation data to examine consistency or variability. Drawing on different data types through participant observation helped to

guard against researcher bias and aided me in gaining a clearer understanding of the setting and the people involved (Taylor and Bogdan 1984).

I have also participated directly in the BCC Terms of Reference Subcommittee in drafting the BCC's mission statement and objectives that has set the stage for the development of industrial operating guidelines for industry in caribou range. Therefore I was well positioned to provide analysis on the structure and participatory nature of the committee.

### **3.2.2 Key Informant Interviews**

A key informant is somebody who, because of their position in a community, organization, family or other group, or because of their life experience, is able to provide information about a group, setting, activity or other object of study that would take a great deal of time to otherwise gather (University of Chicago 1999). Key informant interviews are particularly good vehicles for efficient data collection from people identified as key informants. Interview questions were pretested following the method of Berg (1995). Questions were evaluated before the interviews were conducted by three independent, knowledgeable individuals including an independent industry scientist, a university scientist and the Boreal Caribou Research Program (BCRP) research coordinator. I also asked the first interviewee to evaluate the effectiveness of the questionnaire in relation to the objectives of my research (Berg 1995). Each interviewee was asked at the end of an interview if they knew of anyone else that was knowledgeable about the issues discussed and could provide further information. This technique is known as "snowballing" and is an effective way to identify additional informants (Taylor and Bogdan 1984).

There were ten members of the BCC Guidelines Subcommittee and one environmental consultant that were interviewed (Table 3.1). All interviewees were members of the BCC and represented the spectrum of interests involved in the BCC.

**Table 3.1.** Government departments, industry sectors and scientists involved in the BCC Guidelines Subcommittee, participant observation and key informant interviews.

| <b>BCC Guidelines Subcommittee Membership</b> | <b>Number of Members</b> | <b>Participant Observation</b> | <b>Key Informant Interviews</b> |
|---|--------------------------|--------------------------------|---------------------------------|
| Government (Alberta Environment)              |                          |                                |                                 |
| Alberta Land and Forest Service (LFS)         | 2                        | 2                              | 1                               |
| Natural Resources Service (NRS)               | 2                        | 2                              | 1                               |
| Government (Alberta Resource Development)     | 1                        | 1                              | 1                               |
| Alberta Energy and Utilities Board (EUB)      | 1                        | 1                              | 1                               |
| Industry (Oil and Gas)                        |                          |                                |                                 |
| Conventional Gas                              | 1                        | 1                              | 1                               |
| Conventional Oil                              | 1                        | 1                              | 1                               |
| Heavy Oil                                     | 1                        | 1                              |                                 |
| Pipeline                                      | 1                        | 1                              | 1                               |
| Geophysical                                   | 1                        | 1                              | 1                               |
| Industry (Timber)                             | 2                        | 2                              | 1                               |
| Industry (Peat)                               | 1                        | 1                              | 1                               |
| Researcher (BCRP)                             | 1                        | 1                              |                                 |
| Scientists                                    |                          |                                |                                 |
| Industry Scientist                            |                          |                                |                                 |
| University Scientist                          |                          |                                |                                 |
| Environmental Consultant                      |                          |                                | 1                               |
| <b>TOTAL</b>                                  | <b>15</b>                | <b>15</b>                      | <b>11</b>                       |

Individuals were selected for interviews based on their experience with caribou or with activities that may affect caribou. Each member was responsible for representing the views and opinions of their industry sector or government department. Members were also responsible to communicate information from the meetings to their industry sector or government department. The interviews were tape-recorded and all data from audiotapes and notes were transcribed onto a computer using the word processor, Microsoft Word<sup>®</sup>. All information obtained through key informant interviews was considered representative (i.e., industry, academic, and government data). Forms were coded and names removed, and information pooled across representatives. The key informant interviews included the following topics:



- 1) Participants' role in the BCC and Guidelines Subcommittee;
- 2) Innovative management alternatives that could be used to mitigate loss of caribou habitat due to industrial activity;
- 3) Assessment of the BCC Guidelines process as being an effective tool for evaluating and revising industrial operating guidelines in response to new information from the Boreal Caribou Research Program (BCRP), industry and regulatory authorities; and
- 4) The inclusiveness of stakeholders on the BCC.

### **3.2.3 Framework for Evaluation of Public Participation in the BCC**

Information gathered through participant observation and key informant interviews was evaluated against criteria adapted from Beierle (1999), and discussed in the public participation literature (Creighton 1983, Randolph and Bauer 1999, VanNijnatten 1999).

Five criteria formed the basis of the evaluative framework: educating and informing stakeholders and the public; incorporating public values into decision-making; improving the quality and innovativeness of decisions; fostering trust among stakeholders and public; and reducing conflict among participating stakeholders. A framework such as this is useful for determining whether participatory programs are working, how they can be improved, which mechanisms work best for particular needs and whether participatory programs justify the commitment of public and private resources (Beierle 1999). The evaluation considered the extent to which these criteria were satisfied.

Terms that appear frequently throughout this chapter include stakeholder, stakeholder interests and values. A "stakeholder" is an individual, agency, corporation or organization that may be directly affected by or directly affect decisions pertaining to caribou conservation. "Directly affected" is a term used to describe stakeholders in the Alberta Environmental Protection and Enhancement Act, Natural Resources Conservation Board Act, and Alberta Energy and Utility Board's Guide 62: Responding to Public Concerns about Oil and Gas in Alberta. Based on this definition, government agencies are stakeholders in the multi-stakeholder decision-making process.

“Stakeholder interests” consist of a common collection of needs that a particular group of stakeholders would like to have met (e.g., being able to hunt in a specific area). “Values” are those qualities regarded by a person or group as important and desirable (Houghton Mifflin Company 1990).

### **3.2.3.1     *Criterion 1: Educating and Informing Stakeholders and the Public***

All stakeholders (e.g., those that are involved in the BCC) should gain sufficient knowledge to enable them to deliberate issues and formulate alternatives (Beierle 1999). Education extends beyond the scientific foundations of a particular issue to the decision-making process itself, an understanding of the trade-offs involved in various outcomes, and knowledge regarding the interests and practices of various stakeholders (Beierle 1999). Stakeholders should also gain sufficient knowledge to educate and inform the general public with regards to caribou conservation.

### **3.2.3.2     *Criterion 2: Incorporating Public Values into Decision-making***

Public values and interests are represented through a multi-stakeholder process. Various stakeholders will have differing views about how an issue should be resolved. To give the widest range to discussions about values, assumptions and preferences, all stakeholder interests should be involved in the decision-making process on a level playing field (Beierle 1999).

Excluding a stakeholder interest from the decision-making process will result in decisions that are based on missing or incomplete information (Randolph and Bauer 1999). Inclusion of all stakeholder interests will contribute to the enlargement of the number of alternatives to meet particular problems and increase the soundness and durability of decisions (Creighton 1983).

**3.2.3.3      *Criterion 3: Improving the Quality and Innovativeness of Decisions***

Stakeholders can be a great source of facts and innovative alternatives. They can add useful substantive knowledge or ideas that would not have been available otherwise (Guynn and Landry 1997).

Another benefit of involving the full range of stakeholders in the development of alternative solutions is that in doing so, a commitment to change may be created among the participants (Creighton 1983). Individuals and groups will resist solutions and plans that are imposed on them but they are more likely to support a plan or solution that they have contributed to.

**3.2.3.4      *Criterion 4: Fostering Trust Among Stakeholders and the Public***

Two characteristics of many environmental issues that make committee trustworthiness important are the long time span to realize benefits and costs and the absence of clear feedback on the success of management efforts (Beierle 1999). In the absence of trust, communication between the stakeholders on a committee and between a committee and the public is likely to break down (Creighton 1983, Beierle 1999). One of the most effective ways to gain public trust is to involve and empower the public in decision-making through collaborative processes (Beierle 1999).

**3.2.3.5      *Criterion 5: Reducing Conflict Among Participating Stakeholders***

The public participation process should identify shared values, build the foundation for relationships between stakeholders and utilize a collaborative decision-making approach (Beierle 1999, Randolph and Bauer 1999). The goal of a collaborative process is to reach decisions that can be supported by all of the stakeholders involved (Randolph and Bauer 1999). When conflict arises, interest-based solutions to problem solving should be utilized (Chapter 2).

## **3.3 RESULTS**

### **3.3.1 Criterion 1: Educating and Informing Stakeholders and the Public**

Communication of the BCC partnership process and the results of the BCRP to the stakeholders and the public were achieved through a variety of forums including pamphlets, an annual newsletter, a web site, conference presentations, progress reports and publication in peer-reviewed journals. Communications initiatives have been underway since the creation of NERSC in 1991, to involve and inform Albertans about caribou conservation in Alberta.

The BCC members met twice a year to discuss the results of existing and new research initiatives, funding, and existing and new industrial developments. The BCRP has also held internal workshops to explain and discuss current research and its implications to current industry practices. There is currently no orientation to new members of the BCC. New members rely on information that is passed on to them by their company, agency, department, etc.

In 1996, the NERSC and NWRSC identified that a lack of education and involvement of all stakeholders and the public was a weakness in the process. It was recognized that the long-term conservation of caribou would require awareness and participation of local wildlife and recreational vehicle clubs, wildlife managers and Aboriginal communities (Edey et al. 1998). A Community Participation Subcommittee was established in 1996 to perform the following objectives (Edey et al. 1998):

- Presentation of the NERSC/NWRSC program and its objectives to a broad range of stakeholders and public;
- Make initial contacts with Aboriginal groups to share information on caribou ecology and the NERSC/NWRSC program; and
- Compile public input to form the basis for feedback to NERSC/NWRSC representatives at the annual meetings.

The BCRP has been effective at communicating the results of research initiatives to the existing BCC stakeholders through a variety of forums. However, no orientation to the BCC existed for new members. Therefore, educating and informing BCC stakeholders were partially addressed but an orientation would aid new stakeholders in being fully informed. The communication of the BCC partnership process and the results of the BCRP to the public were achieved through a variety of forums. However, the Community Participation Subcommittee, now known as the Communication/Consultative Subcommittee (Chapter 1), has not been active since the merger of the two regional standing committees (NERSC and NWRSC) in 1999. Therefore, educating and informing the public was only partially addressed by the BCC.

### **3.3.2 Criterion 2: Incorporating Public Values into Decision-making**

The BCC and its subcommittees include industrial users, provincial government land and wildlife managers, university researchers and students, industry regulators (EUB), and environmental consulting companies supporting a forum to discuss the relationships between resource development and the conservation of woodland caribou.

There is currently no involvement of First Nations groups on the BCC. Many of the Treaty 8 First Nations (Beaver First Nation, Bigstone Cree Nation, Chipewyan Prairie First Nation, Dene Tha' First Nation, Fort McKay First Nation, Little Red River Cree Nation, Loon River Cree First Nation, Tallcree First Nation, Whitefish Lake First Nation, and Woodland Cree First Nation) are located in or near caribou range. At one point, the NWRSC did get participation from the Little Red River Cree Nation and Tallcree First Nation but this has since ceased (Natural Resources Service representative).

Seven of eleven interviewees agreed that more involvement from First Nation groups should be a priority of the BCC. These included representatives from pipeline, geophysical, conventional oil, and timber industries, NRS, EUB and an environmental consultant. Reasons for not wanting participation from First Nation groups included:

- 1) The use of the BCC by the First Nation groups as a vehicle to deal with their treaty rights and not follow the objectives of the BCC as stated in the terms of reference (Alberta Resource Development).
- 2) Not wanting the BCC to become too large because decisions are difficult to make when too many stakeholders are involved (conventional gas).
- 3) The government is supposed to represent all public interests including First Nation (LFS and peat industry).

Non-government organizations (NGOs), environmental groups and local organizations such as recreationalists, trappers, local businesses and municipal governments, and other stakeholder and general public groups are not currently involved with the BCC. Six of ten respondents felt that these groups were stakeholders in caribou conservation and should be members of the BCC. These included representatives from pipeline, geophysical, and conventional oil industries, NRS, EUB and an environmental consultant. Concerns over involving such groups within the BCC included:

- 1) Environmental groups don't have a direct impact on caribou whereas industry, government and First Nation groups do (conventional gas).
- 2) Not wanting the BCC to become too large because decisions are difficult to make when too many stakeholders are involved (conventional gas).
- 3) If you start including NGOs and other small local groups such as recreationalists and trappers, it changes the complexion of the BCC from an industry/government working group to integrated land management for the whole land base and that's not the mandate of the BCC (Alberta Resource Development).
- 4) It would be unfair to invite all of these other groups to participate in this process when industry and government are funding it (Alberta Resource Development).
- 5) The government is supposed to represent all public interests including NGOs and local organizations such as environmental groups, recreationalists, trappers, local businesses and municipal governments (LFS and peat industry).

The provincial government representatives on the BCC had the responsibility of representing the public interest. However, representatives from the two different government departments on the BCC (Alberta Environment and Alberta Resource Development) did not represent the entire public interest with regards to woodland caribou management decisions. With only two government departments represented, it was still unclear what aspects of the public interest were represented or if certain aspects (e.g., resource development) were assigned more importance over other aspects (e.g., conservation of caribou).

The majority of interviewees commented that more involvement should be sought from First Nation groups, NGOs, environmental groups and local organizations in the BCC. Current incorporation of public values by the BCC reflects the informative level of public involvement (Chapter 2). Therefore public values are not effectively incorporated into a collaborative decision-making process and criterion two is not satisfied.

### **3.3.3 Criterion 3: Improving the Quality and Innovativeness of Decisions**

Having each resource sector being represented in the BCC Guidelines Subcommittee allowed for each sector and the regulators to learn about how each industry currently operates. Through brainstorming and dialogue between members, innovative ideas were identified. Key informant interviews and observation of the BCC Guidelines Subcommittee participants revealed the following innovative ideas to reduce anthropogenic disturbance in caribou range:

- Use of a Geographic Information System (GIS) for the development and implementation of annual and long-term caribou range plans;
- Change of vegetation management programs on pipeline right-of-ways (ROWs) to allow for more vegetation re-growth along ROWs;
- Better planned developments and use of existing access and utilities where possible by sharing of information between industries (integrated land management);

- Remote operation of all upstream oil and gas facilities in caribou range;
- Earlier and coordinated planning of developments;
- Use of hand-cut or heli-portable seismic in caribou range;
- Having only a certain percentage of the caribou range under development at one time;
- Rotate industrial activity throughout the range so that some of it is left undisturbed;
- Limit the cumulative amount of development in caribou range;
- Give industry rebates or incentives not to develop in caribou ranges; and
- Re-vegetation of existing unused linear corridors.

None of these ideas were included in the proposed consolidated industrial operating guidelines for caribou range (Appendix 2). Participants' evaluation of the proposed consolidated guidelines revealed that they are not an improvement over existing regional guidelines in terms of protection of caribou and their habitat (Chapter 4). Analyses for six study areas in northern Alberta suggest that caribou populations in most boreal ranges have been declining since monitoring began in the early 1990s (Dzus 2001). Even though innovative ideas may be identified, the quality and innovativeness of management decisions made by the BCC have not shown any significant improvements over past decisions. The inability to increase the quality or innovativeness of management decisions is reflective of the consultative approach to public involvement (Chapter 2). Therefore, a collaborative approach has not been used to increase the quality or innovativeness of management decisions and criterion three is not satisfied.

#### **3.3.4 Criterion 4: Fostering Trust Among Stakeholders and the Public**

Participant observation and comments from seven interviewees suggested that a lack of trust existed among stakeholders involved in the BCC and its Guidelines Subcommittee. A lack of trust may be exhibited through inconsistent information, a lack of free information exchange, a lack of commitment to achieve consensus, or stakeholders attempting to create a favorable image by merely going through the motions of participation within the BCC and the Guidelines Subcommittee. This lack of trust among



stakeholders was reflected in several opinions developed by the participants. These opinions included:

- A lack of commitment or “buy-in” to the new guidelines from senior management of both government and industry (NRS and LFS);
- Industry stakeholders are involved in the BCC but aren’t willing to change the way they operate to benefit caribou conservation (NRS, pipeline, and LFS);
- The research on industrial activity’s effects on woodland caribou has been inconclusive (conventional gas, Alberta Resource Development, conventional oil and geophysical);
- Information regarding industrial activity and its effects on woodland caribou was sent to the media without the BCC Guideline Subcommittee’s knowledge (conventional oil); and
- Inconsistency by government regulators when enforcing regulations in caribou ranges (conventional gas).

Public trust can be gained through involvement of all stakeholder interests in the decision-making process. However, input from all stakeholder interests was not part of the decision-making process within the BCC. Therefore criterion four is not fully satisfied due to the lack of trust among existing stakeholders and the lack of trust building with all possible stakeholder interests.

### **3.3.5 Criterion 5: Reducing Conflict Among Participating Stakeholders**

The BCC Guidelines Subcommittee used a power-based approach to resolve disputes among stakeholders during the process. Through committee observation and semi-directive interviews it became evident that there was a lack of focus on the terms of reference. Many of the industrial operators and regulators were in a negotiation based on compromise when setting the deadlines for activity in caribou range. This produced win-lose solutions in which one party gained only at the expense of another (Fisher et al. 1991) (Chapter 2). Interest-based conflict resolution principles (Chapter 2) were not

utilized by the Subcommittee. The proposed consolidated guidelines, created by the Guidelines Subcommittee, did not achieve support from all of the members (Chapter 4). All interviewees stated that the decision-making and dispute resolution processes within the Subcommittee needed to be improved. Although the Guidelines Subcommittee provided a forum to discuss caribou conservation and each industry's needs with regards to resource extraction, criterion five was not fully satisfied by the mechanisms used by the Guidelines Subcommittee to reduce conflict.

### 3.4 DISCUSSION

There is currently no orientation process for new members that become involved with the BCC. Recently, both government and industry stakeholders have experienced “downsizing” and merging of departments or companies. These processes have resulted in changing corporate environmental managers and regulators that are unfamiliar with the BCC. New members must rely on information that is passed on to them by their company, agency, department, etc. These new members are frequently misinformed or lacking information regarding previous, current and future woodland caribou research initiatives, industrial operating guidelines and public communications. **All new members of the BCC should receive an orientation that includes the BCC Terms of Reference, information on historical and current status of the woodland caribou, research summaries and current management strategies that are being employed for the protection of this ungulate.**

A wider range of stakeholders needs to be included in the BCC to ensure that the first criterion is met (educating and informing stakeholders and the general public). **The Community Participation Subcommittee should be resurrected to ensure that the public is being educated and informed with regards to caribou conservation issues and to ensure that all stakeholder interests are involved in the decision-making process.**

Alberta Government Information Letter (IL)-91-17 sought to bring government and industry together to foster cooperation and share information regarding caribou conservation (Alberta Energy 1991). This was the first step towards replacing a traditional command-and-control approach with a process that included more public involvement regarding caribou conservation. It is the government's responsibility to represent the public interest on the BCC. However, it was often unclear during BCC Guidelines meetings what aspects of the public interest should be represented or if certain aspects, such as resource development, should be given more importance over other aspects, such as conservation of caribou. The majority of interviewees, representing both government and industry groups, agreed that the BCC should seek more involvement from a wider range of stakeholders.

All stakeholder interests must be involved in decision-making for the process to be truly collaborative (Margerum 1999). All participating stakeholders, including government representatives, must effectively communicate their newly acquired knowledge and understanding to the organizations they represent and to the public. It is also important for participating stakeholders to gain an appreciation of heterogeneous community views and to gain support for any decisions that need to be made (Margerum 1999). Inclusion of all stakeholder interests requires the active participation of a broad range of people, not just those in formal positions of decision-making authority (Briand 1998). Decisions can't be made, implemented and sustained without the cooperation of all affected groups. Exclusion of any stakeholder interest from the decision-making process would result in the failure to include all the perspectives that stakeholders may have with respect to caribou conservation decisions. Thus the collective understanding remains incomplete and decisions made by the BCC may be inaccurate.

First Nation groups are allowed to hunt woodland caribou and are also affected by industrial operating guidelines that restrict the timing or amount of development on caribou range. Currently, very little information exists on the quantity of woodland caribou hunted by First Nations in northern Alberta (Alberta Natural Resources Service representative, pers. comm.). More communication regarding sustained harvest needs of

the First Nation groups and caribou conservation initiatives of the BCC needs to occur. Getting First Nation groups involved in the BCC is not easy as has been demonstrated with some failures in the past. A multi-stakeholder process may not be the best forum for encouraging a minority cultural group to participate, particularly if the minority group has special legal rights. Active solicitation, trust building, and equal involvement in decision-making will lead to more First Nation involvement in the BCC and a more collaborative decision-making process. As one interviewee stated, “I think there has to be more of an effort to not just invite people to meetings but to figure out if this is the best forum for this person to make their presentation on this issue. Perhaps there is some Aboriginal group out there that just wants to make a statement about how they feel about the existing guidelines or about caribou and have their opinion be counted or it may be a case where there’s an Aboriginal group that wants more active participation in developing land-use guidelines. I just think that inviting groups to a table to discuss something isn’t always enough.”

Healey (1996) outlined some important aspects that a committee has to consider to become more inclusive of different cultures:

- Opening up the process in terms of setting the arenas and forums for discussions.
- Different styles of discussion.
- Different methods of analysis (how to sort through arguments and different perspectives).
- How results from analysis are included into policy.

Wildlife managers are stewards of a public resource (Decker et al. 1991). Collaborative decision making processes allow public values to be reconciled as the basis for setting goals, lending to feasible and measurable objectives, and ultimately to wise and enduring solutions with a broad public base of support (Susskind and Cruikshank 1987). Although the BCC has identified some objectives (Boreal Caribou Committee 1999), the committee, needs to set more feasible and measurable objectives that include woodland caribou population density, habitat and human development or economic objectives for

caribou range in northern Alberta. The full range of public values needs to be reconciled as the basis for these objectives. Currently, scientific values are allowed to blend with stakeholder values in the decision-making process of the BCC. Technical expertise should be provided by the BCRP for evaluating the feasibility of technical objectives and predicting the consequences of management alternatives. Values of the wildlife management professional or scientist should be kept separate from the values of the stakeholders in the decision-making process. The practice of misrepresenting an ethical judgement as science can be noticed by an astute public, and result in discredit to wildlife scientists (Decker et al. 1991). The public's ability to recognize the difference between ethical and scientific judgements should not be underestimated, even though this distinction can be very difficult for the scientist to make them self (Decker et al. 1991).

**All stakeholder interests should be involved in the decision-making process and the blend of scientific and public values should be restricted to more fully incorporate public values into a collaborative environmental decision-making process.** This would help to satisfy criterion two (incorporating public values into decision-making), and is part of a collaborative approach to managing a public resource. If the process of decision-making were made more inclusive of a wider range of interests, these broadened deliberations would result in better environmental policy decisions (VanNijnatten 1999).

Widening the range of stakeholders involved in the BCC would bring different positions, interests and values to the table. While diversity can make problem resolution complex, it can also add to the innovativeness of the decisions reached. Effective participatory opportunities would help to prevent industry domination of policymaking processes and increase the amount of policy innovation (VanNijnatten 1999). As one interviewee states, "I think you can come up with much better ideas and in the end come up with a much better scenario for the caribou ultimately if you bring all these different groups to the table."

Remote operation of facilities is one example of an innovative practice that is an excellent strategy for protecting caribou habitat. The lack of roads required for remote

operation would mean less access by the public and would result in less habitat loss and alteration (Price and Schroter 1997). Additionally, less traffic through caribou range would minimize sensory disturbance suffered by caribou (Price and Schroter 1997). The cost of remotely operating a production facility is one barrier to their implementation in caribou zones. However, alternative methods of access, remote monitoring and controlling systems, and the use of technology that results in a decreased need to access well sites, should be used whenever possible by industrial operators that are committed to the conservation of caribou (Price and Schroter 1997).

Government policies, or the lack of them, were another barrier to the implementation of new or innovative ideas. For example, there was an issue with closing or impeding existing access routes (e.g., roads, seismic routes, etc.) because they are considered traditional access and cannot be closed without collaborative public involvement (Chapter 4). At this stage, the government hasn't embarked on an extensive collaborative public involvement process that would be required to close or restrict existing access routes in caribou range. As one interviewee stated, "Government has to be a little more proactive in dealing with those situations. If those things aren't done the guidelines process is not going to move forward."

A stronger commitment to involve the full range of stakeholders in the decision-making process would result in a wider range of alternatives and increase the innovativeness of decisions (Creighton 1983, VanNijnatten 1999). A strong commitment or "buy-in" from all participating stakeholders is necessary to address the alternate or innovative ideas and the barriers that are blocking their implementation. Furthermore, the principles of interest-based negotiations (Chapter 2) should have been utilized during the BCC Guidelines Subcommittee meetings to aid in addressing the innovative ideas and the barriers that are blocking their implementation. **A stronger commitment should be sought from all participating stakeholders and interest-based negotiations should be used to increase the innovativeness and quality of decisions made by the BCC Guidelines Subcommittee.**

In the absence of trust, communication between stakeholders is likely to break down (Creighton 1983). Poor communication enhances the possibility of error and misinformation, which in turn reinforces the lack of trust between stakeholders (Table 2.2). Poor communication and misunderstanding of information due to lack of trust has led to misinterpretation of research on the effects of industrial activity on caribou. Decisions and guidelines need to be based upon the best available knowledge at the time. Often research of one particular topic will bring about more questions that need to be answered regarding that topic and others. The long time span to realize benefits and costs and the absence of clear feedback on the success of management efforts are two characteristics of many environmental issues that make committee trustworthiness important (Beierle 1999).

The research program thus far has failed to provide a model that allows one to predict definitive impacts on caribou based on amount and type of development. However, it has provided some evidence on the effects of linear corridors (James 1999, James and Stuart-Smith 1999, Dyer 1999), timing and amount of disturbance (Bradshaw 1994, Bradshaw et al. 1998) that industrial activity has on caribou. When industrial operating guidelines and decisions are made regarding a species at risk such as caribou it is better to be precautionary and use the best available research, than liberal and wait for the results of future research to arrive. One output from the Earth Summit was the Rio Declaration on Environment and Development, a set of 27 principles to guide approaches to environmental management and economic development. Principle 15 contains the “precautionary principle”. This principle states “where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation” (Mitchell 1995).

The fact that public perceptions are involved means that a stakeholder (e.g., industrial operator) might attempt to create a favorable image by merely going through the motions of participation within the BCC and the Guidelines Subcommittee. However, it does not take long for other stakeholders in the group, and the public, to realize that the public participation process is not genuine (Creighton 1983). As a result, any plans or

guidelines put forth by the group will be opposed (Creighton 1983). One of the most effective ways to gain public trust is to involve and empower the public in decision-making (Beierle 1999). Thus far, input from all stakeholder interests has been excluded from the decision-making process within the BCC. Resurrection of the Community Participation Subcommittee would be one way to start getting the various stakeholder groups involved in the decision-making process.

The lack of trust amongst stakeholders involved in the Guidelines Subcommittee led to the belief that some parties are participating to uphold an image or safeguard their territory instead of fostering cooperation and striving for consensus on issues in the guidelines. For example, one interviewee stated, “From the onset of the Guidelines Subcommittee the trust factor was gone. We had a polarization of the government and industry where what it should have been was everybody working together towards a common goal. Instead it became confrontational and everyone was just protecting their own company or sector.” Another interviewee commented, “I see a lack of commitment from a lot of players. I think they’re coming here because they have to but I don’t think they’re looking at the bigger picture and really trying to wholeheartedly develop guidelines that will serve caribou conservation goals. I think they’re coming here to represent their sector and to safeguard it.” For collaborative decisions to be made, trust between participants is essential (Randolph and Bauer 1999).

Another factor that led to lack of trust among participants of the Guidelines Subcommittee was the inconsistency by regulators when enforcing guidelines in caribou ranges. One interviewee states that, “If regulators are inconsistent it creates mistrust, frustration and animosity.” Stakeholders are more likely to abide and support guidelines that are enforced consistently. To avoid this problem, industrial operating guidelines for caribou range need to be written clearly and concisely so that they can be easily understood. Secondly, the provincial government needs to hold workshops with all of its regulators and industrial operators to answer any questions regarding the guidelines and ensure that they are enforced consistently throughout the province.



BCC membership changed over time and there were no specific requirements for the number of members from each industry, government, or university sector. The variability in the type and number of participating stakeholders made it difficult to build trust. The principles of interest-based negotiation (Chapter 2) are difficult to achieve when there is inconsistent membership participation at meetings. The collaborative environmental decision-making process works best when trust building occurs in small groups (Randolph and Bauer 1999). In order to follow the principles of interest-based negotiation and build trust between stakeholders, each sector (i.e., industry, government, and university) should have consistent representation at each meeting.

**Trust is an important factor in the public participation forum and it should be attained between all participating stakeholders, and between participating stakeholders and the public, before criterion four can be satisfied and meaningful decisions or guidelines can be accomplished.** Building of trust between participants should have started at the beginning of the BCC Guidelines Subcommittee. Trust is built on respect and understanding of each other's interests (Randolph and Bauer 1999). Guidelines Subcommittee participants should have focused on interests rather than positions and sought to discover the motivations behind each party's positions. Participants should have come to see themselves as working together side by side, attacking the problem, not each other's position (Fisher et. al. 1991).

While the majority of representatives interviewed found the BCC Guidelines Subcommittee to be an appropriate committee for evaluating and revising guidelines in response to new information from the BCRP, industry and regulatory authorities, all interviewees stated that the decision-making and dispute resolution processes within the Subcommittee needed to be improved. A capable facilitator or chairperson could aid the committee by helping to solve disputes and ensuring that the goals and objectives of a committee are achieved within a timeline (Barnes 1996) (Chapter 2). **The BCC Guidelines Subcommittee needs a capable facilitator or chairperson to guide the dispute resolution process and to keep participants focused on the terms of**

**reference.** One interviewee stated, “We needed a good facilitator that did a good job of dealing with the issues and kept the committee on track.”<sup>1</sup>

The power-based approach to dispute resolution (Chapter 2) did not function well in the Guidelines Subcommittee. Individuals focused on positions rather than specific interests. Bargaining for industrial operating deadlines in caribou range created a win-lose scenario rather than a consensus-based decision. **The principles of interest-based negotiations should have been followed by the BCC and its Guidelines Subcommittee to achieve consensus-based decisions.** As stated by one interviewee, “Rather than having really good guidelines that are moving us ahead it seems like everybody is trying to get their own agenda satisfied so we’re coming down to what everybody can live with. You can’t possibly do that and still have valuable guidelines to conserve caribou.”

The BCC and its Guidelines Subcommittee exhibited some of the qualities of a collaborative participatory model but they failed to meet any criterion outlined in the evaluation framework. The structure and terms of reference for the BCC and its subcommittees largely reflect the multi-stakeholder consultation (MSC) mechanism (Chapter 2). The objective of MSC is shared policymaking through information transfer, discussion and trade-offs among parties (VanNijnatten 1999). Decision-making in the BCC is shared among government and industry stakeholders. This decision-making often gave rise to conflict where trade-offs were seen as the only option to achieve a solution. The BCC lacks the characteristics of a truly collaborative committee that utilizes interest-based negotiation to resolve conflicts.

In summary the following recommendations are made to the BCC and its Guidelines Subcommittee to help it more fully meet the goals of the public participation evaluation framework:

- 1) The Community Participation Subcommittee should be resurrected to ensure that the public is being educated and informed with regards to caribou conservation issues.

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<sup>1</sup> A new BCC Guidelines Subcommittee has subsequently been formed and has involved a facilitator.

- 2) All new members of the BCC should receive an orientation that includes information on the historical and current status of the woodland caribou, research summaries and current management strategies that are being employed for the protection of this ungulate.
- 3) All stakeholder interests should be involved in the decision-making process. The BCC needs to set more feasible and measurable objectives that include woodland caribou population density, habitat and human development or economic objectives for caribou range in northern Alberta. The full range of public values needs to be reconciled as the basis for these objectives and the blend of scientific and public values should be restricted to more fully incorporate public values into a collaborative environmental decision-making process.
- 4) A stronger commitment should be sought from all participating stakeholders and interest-based negotiations should be used to increase the innovativeness and quality of decisions made by the BCC Guidelines Subcommittee.
- 5) Stakeholders should build trust amongst each other and with the public before meaningful decisions and guidelines can be formed. Trust can be attained through consistency in the way guidelines are enforced by regulators, understanding current research and the information gaps that exist, the use of the precautionary principle when making decisions and ensuring that the participation by each stakeholder is genuine.
- 6) The BCC Guidelines Subcommittee should use a facilitator to guide the dispute resolution process and ensure that the goals and objectives of the committee are achieved within a timeline.
- 7) Interest-based negotiations should be used when dealing with conflict.

### **3.5 MANAGEMENT IMPLICATIONS**

It is important to appreciate that many aspects of ecosystems are not understood by humans. However, management decisions must be made despite uncertainty and conflict. As a result, resource managers often find themselves involved in situations where the solutions are not black and white, but shades of grey (Mitchell 1995). The preceding

recommendations to the BCC to improve public participation will increase the quality of management decisions while reducing the uncertainty and conflict.

IL-91-17 laid the initial framework for an integrated approach to manage woodland caribou in Alberta. It is now ten years later and the framework needs to be adjusted. It has been acknowledged that an ecosystem or landscape approach should be adopted for conserving caribou and the full range of biodiversity on the landscape (The Seventh North American Caribou Conference Workshop Notes, 1998). This shift to ecosystem management requires collaboration between many decision-makers. Decision-making at this level requires that all interests, not only government and industry, be part of the decision making process. Using the recommendations contained in this chapter for increasing the effectiveness of public participation within the BCC will lead to increased quality of management decisions and greater support for those decisions.

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### **Personal Communications**

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## CHAPTER 4

### 4.1 INTRODUCTION

Woodland caribou distribution and populations have declined in North America since the early 1900s, particularly along the southern edge of their range where most human encroachment has occurred (Banfield 1961, Bergerud 1974, Edmonds 1986, Cumming and Beange 1993, Alberta Environmental Protection 1998, Rettie and Messier 1998). There is inconclusive data on historical and current population size and trend of woodland caribou in Alberta, but wildlife managers have perceived a decline over the past century and have stated the need to provide protection to maintain their numbers and distribution (Dwyer 1969, Bloomfield 1980, Edmonds 1986). Stelfox (1966) estimated a provincial caribou population of 6860-9060 in 1966. Lynch and Pall (1973) estimated the population at 4800-5200 in 1973, and in 1980 Bloomfield estimated that there were no more than 1500-3500 woodland caribou in Alberta. Inventory techniques used to obtain population estimates were speculative (Stelfox 1966) and evaluations of trends was not based on robust data (Bradshaw and Hebert 1996). The current estimate of woodland caribou in Alberta still remains very broad (3600-6700 animals) due to their relatively elusive behaviour, low densities and use of inaccessible habitat (Bradshaw and Hebert 1996). Recent analyses for five study areas in northern Alberta suggest that caribou populations in most ranges are declining (Dzus 2001).

Hunting of caribou has been regulated in Alberta since 1903 (Edmonds 1986). Lynch and Pall (1973) reported that a lack of knowledge concerning caribou abundance and the reduction of suitable habitat through forest fires, logging, mining and clearing for agriculture, were the greatest threats to Alberta's caribou herds in the early 1970s. Nearly a decade later, after a review of the status of caribou and their management in Alberta and an evaluation of the impacts of various land-use activities, Bloomfield (1980) recommended a total hunting closure for caribou in Alberta. He recommended that the closure be maintained until the following conditions were satisfied: adequate information is collected on seasonal habits and requirements; occupied ranges are identified and



protected, particularly areas used during winter, calving, breeding and movement corridors; populations were properly inventoried; population structure and capacities are evaluated; a comprehensive management plan, including guidelines for recreational and industrial activity, is developed; and a sizeable and significant increase in caribou numbers is realized.

Licensed caribou hunting was closed in Alberta in 1981. In 1991 Alberta's woodland caribou were put on the 'Red List' of at risk species in the province (Alberta Fish and Wildlife 1991). In 1996, the species was moved to the 'Blue List' of species that may be at risk in Alberta (Alberta Wildlife Management Division 1996). Woodland caribou in Alberta are designated as 'threatened' under the Alberta Wildlife Act (Dzus 2001). The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) currently designates the woodland caribou in Alberta (Boreal population) as 'threatened' (COSEWIC 2000).

By the winter of 1990/1991, concern that the cumulative effects of continued industrial incursion into the caribou's core range was affecting the long-term viability of the species led to the implementation of land-use guidelines for industrial activity in caribou range in Alberta. In 1991 the Alberta Energy and Utilities Board issued Information Letter (IL) 91-17. This was a procedural guide for oil and gas activity on caribou range. The procedural guide stated that, "Petroleum and natural gas exploration and development can occur on caribou range, provided the integrity of the habitat is maintained to support its use by caribou." (Alberta Energy 1991) The guide also recommended cooperation between government and industry and the establishment of Standing Committees (SCs) for areas of the province in which industrial activity occurs in caribou ranges.

The Northeast and Northwest Regional Standing Committees (NERSC and NWRSC) on woodland caribou were initiated in 1991 and 1994 respectively. Their mandate was to serve as an advisory body to a regional environmental resource management committee (Hamilton and Edey 1998). One of their objectives was to recommend effective and

practical industry operational guidelines for industry in caribou ranges (Chapter 3). The Northwest and Northeast Standing Committees were amalgamated in 1999 to form the Boreal Caribou Committee (BCC). The BCC drives an adaptive management program that periodically reviews land-use guidelines in relation to newly acquired information. In January 2000 a BCC Guidelines Subcommittee was formed to review existing regional industrial operating guidelines for caribou ranges in the Boreal Forest Natural Region of Alberta and to develop and implement a set of consolidated, industrial operating guidelines for this area. The consolidated guidelines were to reflect current knowledge and research on caribou ecology, and address the cumulative effects of industrial activity.

The purpose of this project was to facilitate an evaluation of the proposed consolidated industrial operating guidelines for caribou conservation in the Boreal Forest Natural Region of Alberta by the BCC Guidelines Subcommittee. The evaluation considered the potential of the proposed consolidated guidelines to reduce the cumulative effects of existing and new development in caribou range in comparison with existing regional guidelines. Finally, BCC members considered possible future alternatives for management of industrial activities in caribou range.

## **4.2 METHODS**

The BCC Guidelines Subcommittee was composed of industry members from each resource sector that operates in caribou range (conventional gas, conventional oil, heavy oil, pipeline, seismic, timber, and peat), government members from two different departments (Alberta Environment and Alberta Resource Development) and a researcher from the BCRP (Table 4.1). Each member was responsible for representing the views and opinions of their industry sector, government department or research group at BCC Guidelines Subcommittee meetings. Members were also responsible to communicate information from the meetings to their industry sector, government department or research group. I facilitated an evaluation of the consolidated industrial operating guidelines, which were drafted by the BCC Guidelines Subcommittee. The evaluation involved members of the BCC as a whole, the Guidelines Subcommittee and the

Research Subcommittee (Table 4.1). The BCC determined the nature of the evaluation and excluded an independent evaluation. I used three methods to facilitate the guidelines evaluation: participant observation, key informant interviews and a questionnaire. In addition I facilitated an evaluation of five future strategies for managing industrial activities in caribou range using key informant interviews. This research protocol satisfied ethics of human studies requirements of the University of Calgary Conjoint Faculties Research Ethics Board.

**Table 4.1.** Government departments, industry sectors and scientists involved in the BCC Guidelines Subcommittee, participant observation, key informant interviews and questionnaire.

| <b>BCC Guidelines Subcommittee Membership</b> | <b>Number of Members</b> | <b>Participant Observation</b> | <b>Key Informant Interviews</b> | <b>Questionnaire</b> |
|---|--------------------------|--------------------------------|---------------------------------|----------------------|
| Government (Alberta Environment)              |                          |                                |                                 |                      |
| Alberta Land and Forest Service (LFS)         | 2                        | 2                              | 1                               | 2                    |
| Natural Resources Service (NRS)               | 2                        | 2                              | 1                               | 5                    |
| Government (Alberta Resource Development)     | 1                        | 1                              | 1                               |                      |
| Alberta Energy and Utilities Board (EUB)      | 1                        | 1                              | 1                               | 1                    |
| Industry (Oil and Gas)                        |                          |                                |                                 |                      |
| Conventional Gas                              | 1                        | 1                              | 1                               | 1                    |
| Conventional Oil                              | 1                        | 1                              | 1                               |                      |
| Heavy Oil                                     | 1                        | 1                              |                                 |                      |
| Pipeline                                      | 1                        | 1                              | 1                               |                      |
| Geophysical                                   | 1                        | 1                              | 1                               | 2                    |
| Industry (Timber)                             | 2                        | 2                              | 1                               | 2                    |
| Industry (Peat)                               | 1                        | 1                              | 1                               |                      |
| Researcher (BCRP)                             | 1                        | 1                              |                                 |                      |
| Scientists                                    |                          |                                |                                 |                      |
| Industry Scientist                            |                          |                                |                                 | 2                    |
| University Scientist                          |                          |                                |                                 | 1                    |
| Environmental Consultant                      |                          |                                | 1                               | 1                    |
| <b>TOTAL</b>                                  | <b>15</b>                | <b>15</b>                      | <b>11</b>                       | <b>17</b>            |

The BCC Guidelines Subcommittee held 15 meetings from December 1999 to December 2000. Representatives from both government and industry were unable to attend all

meetings. Representation from the pipeline and heavy oil sector waned as the meetings continued throughout the year. Some representatives may have changed roles within a department or company, or completely changed departments or companies and were no longer able to attend the meetings. Other representatives could not make the time commitment that was required to attend all meetings. Thus, there were no participants represented in the questionnaire from the following industry sectors or government departments: pipeline, heavy oil, conventional oil, peat and Alberta Resource Development. No participant was available from the heavy oil sector for the key informant interviews. Despite the fact that Guidelines Subcommittee participants were representative of their industry sector or government department the questionnaire revealed some varying opinions between members within the same sector or department.

#### **4.2.1 Participant Observation**

I participated with the BCC Guidelines Subcommittee since its inception in December 1999. Observation occurred with the consensus and support of the BCC Guidelines Subcommittee. The Subcommittee met 15 times from December 1999 to December 2000 and I attended 14 of the 15 meetings. Through participation, I was able to observe and experience the meanings and interactions of people from the role of an insider. This was adequate time to gain acceptance by the group, to establish a working relationship with members of the Subcommittee and to understand their unique positions and concerns regarding the revision of industrial operating guidelines for caribou ranges in northern Alberta.

Direct observations of participants and their interactions (e.g., what they said or how they reacted to what was said) during the meetings were recorded. Information was also gathered from documents (e.g., emails, position papers, media articles, etc.) that were distributed and discussed during the meetings. Data recording and analysis followed the methodology described by Jorgenson (1989). A hand written log of the conversations and interactions between participants was kept for each meeting. The log was transcribed into an electronic file (Microsoft Word<sup>®</sup>). A separate file was established for each

meeting. Information was coded according to sector (e.g., oil and gas, forestry, peat, Alberta government), and where possible information from key informant interviews and questionnaires was compared with participant observation data to examine consistency or variability. Drawing on different data types through participant observation helped to guard against researcher bias and aided me in gaining a clearer understanding of the setting and the people involved (Taylor and Bogden 1984).

#### **4.2.2 Questionnaire**

Some of the information used to evaluate the proposed guidelines was obtained using a questionnaire (Appendix 1) developed by Bob Wynes (Research Co-ordinator, Boreal Caribou Research Committee). The questionnaire sought comments on the potential of the proposed consolidated guidelines to reduce the effects of existing and future development on caribou. Participants were requested to compare the proposed guidelines with the existing regional guidelines for protecting caribou and their habitat.

The questionnaire was emailed to members of the Guidelines Subcommittee and the Research Subcommittee. There were 17 respondents to the questionnaire (Table 4.1). Information, including the participants' evaluation of a specific portion of the proposed consolidated guidelines and suggestions for improvement, was categorized into tables (Appendix 2). Variation in opinions between respondents within the same government department or industry sector and among sectors was noted in the results. Information from the questionnaire was also compared with participant observation data for the same individual to establish consistency between the two data sources. If comments were found to be unclear in the questionnaire, respondents were asked to clarify their statements.

#### **4.2.3 Key Informant Interviews**

A key informant is somebody who, because of their position in a community, organization, family or other group, or because of their life experience, is able to give you

information about a group, setting, activity or other object of study that would take a great deal of time to gather on your own (University of Chicago 1999). Interview questions were pretested following the method of Berg (1995). Questions were evaluated before interviews were conducted by three independent, knowledgeable individuals including an independent industry scientist, a university scientist and the BCRP research coordinator. I also asked the first interviewee to evaluate the effectiveness of the questionnaire in relation to the objectives of my research (Berg 1995). Each interviewee was asked at the end of an interview if they knew of anyone else who was knowledgeable about the issues discussed and could provide further information. This technique is known as “snowballing” and is an effective way to identify additional informants (Taylor and Bogden 1984).

The interviews were tape-recorded and all data from audiotapes and notes were transcribed onto a computer using the word processor Microsoft Word<sup>®</sup>. All information obtained through key informant interviews was considered representative (i.e., industry, conservation, academic and government data). Forms were coded and names removed, and information pooled across representatives. Information regarding evaluation of possible future alternatives for management of industrial activities in caribou range was categorized in a table and comparisons were made between representatives.

## **4.3 RESULTS**

I first describe the existing regional guidelines for industrial activity in caribou range to provide a frame of reference for subsequent analysis. These guidelines are contained within Appendix 3. Then I provide the results of an evaluation by the BCC of proposed consolidated guidelines and future management scenarios.

### **4.3.1 Existing Guidelines for Industrial Activity**

Industrial operating guidelines in caribou range were established in northeastern Alberta in 1991 and were modified for the northwestern area of the province in 1994 (Figure 4.1).

Guidelines had been developed for the following regions: Northeast, Northwest, Red Earth and Slave Lake (Figure 4.1) (Appendix 3).



**Fig. 4.1.** Woodland caribou management zones (shaded areas) based on the identification of suitable habitat and/or current caribou distribution in Alberta. NW=Northwest management zone guidelines, NE=Northeast management zone guidelines, RE=Red Earth management zone guidelines, SL=Slave Lake management zone guidelines (adapted from Dzus 2001).

In general, the guidelines attempted to manage industrial activity on caribou ranges through access management, minimizing new development and placement of constraints on the timing or sequencing of industrial operations.

Access is defined as “the means of approaching or entering an area” (Houghton Mifflin Company 1990). Access largely consists of roads but can be any linear corridor including seismic lines and pipelines. Cutblocks were not considered a component of access since they are typically located in upland habitat not frequented by caribou. The guidelines encouraged access management on roads that are used by the timber industry to cut and haul their product. However, timber harvesting of upland areas adjacent to lowland peatland complexes occupied by caribou may also increase predation pressure on caribou. Habitat alteration may facilitate increased predation on woodland caribou by providing habitat for other prey species that, in turn, support a higher density of predators (Cumming 1992, Seip 1992, Rettie & Messier 2000). Alteration from old forest stands to young successional forests potentially allows for the increase of moose and deer populations that feed on the regenerating browse (Kelsall 1984, Hristienko 1985, James 1999). In turn, a wolf population may increase in response to moose density, thus increasing predation pressure on caribou (Cumming 1992). After the moose density declines there may be a time lag in the wolf population response and the wolves may shift to alternative prey such as caribou (James 1999, Rettie & Messier 2000).

Access management attempted to reduce the disturbance to caribou from on-site workers and the public, provide caribou with protection from sources of human-caused direct mortality and minimize the use of access by predators. Access management as outlined in the guidelines, largely consists of manned gates, signs, education of employees and patrols. Rollback of slash (trees, shrubs, dirt) or blockage of the access during non-active periods was also encouraged to minimize use by humans and predators. The Red Earth and Northwest guidelines also recognized that public support is necessary for access management when traditional access routes are involved.



The guidelines attempted to minimize the quantity and quality of new access development by suggesting use of Low Impact Seismic (LIS), existing access, shared/common access, temporary winter access for exploration/development programs, and petroleum production operations without permanent surface access (remote operations). According to Alberta Environmental Protection (1994), LIS is a combination of line cutting methods using a linear route selection process that minimizes disturbance to the ecosystem, including consideration of forest fibre and non-fibre values, and at the same time meets operational requirements and considers economic needs of industry. The use of LIS decreases the amount of timber that needs to be cut for an exploration program thus causing less of a disturbance and minimizing habitat alteration.

Each company operating in caribou range must complete a Caribou Protection Plan. The plans state how each company will address access management, minimize new development and co-ordinate the timing or sequencing of the project. A Caribou Protection Plan is submitted to the applicable Ranger District Office every season with each oil and gas disposition in caribou range.

The Northwest guidelines divided the caribou ranges into two areas; those with existing activity and those without. Existing Activity Areas are all areas within one mile of an existing all weather road and all operations that have produced oil and gas using frozen access (Alberta Energy 1994). The Existing Activity Area was established under the Northwest guidelines on October 1, 1994 as a permanent designation. Companies operating in existing activity areas have not been required to submit a Caribou Protection Plan. It appears that caribou conservation has been eliminated as a concern in these areas. All areas within caribou ranges that are not in Existing Activity Areas are defined as New Activity Areas (Alberta Energy 1994). Exploration and development within New Activity Areas occurs primarily on frozen ground. Companies with production facilities in New Activity Areas have been encouraged to operate them remotely (i.e., without permanent surface access). Caribou Protection Plans are required for companies operating in New Activity Areas. The Northeast guidelines used a similar concept to

manage activity on caribou range except they did not officially designate Existing Activity Areas or New Activity Areas. Instead these guidelines identified areas of high industrial activity and drew the caribou range boundaries around such areas.

Heavy oil development areas in the Northeast are described using an Infield Zone and an Outfield Zone. An Infield Zone is defined as the main core area of high intensity activity where drilling and construction operations are allowed. Outfield Zones are outside of the core area of activity. Each year a meeting with the local regulatory persons and the industrial operators is convened, at which time a geographic boundary around a heavy oil development is established. This boundary delineates Infield and Outfield Zones and they are marked on an operations plan map (Alberta Environment 1999). Between March 1 and June 15, no activity other than production operations is allowed in the Infield Zone. All activity in the Outfield Zone is prohibited between March 1 and June 15. These zones are delineated on a yearly basis and thus can change in size and shape annually. The Northwest guidelines contain a similar area called the Heavy Oil Exemption Area. This area is operated similarly to the heavy oil areas in the Northeast and the boundaries are also reviewed on a yearly basis.

An ‘early in early out’ philosophy was adopted for the Northeast and Northwest guidelines to minimize behavioural and physiological stress on caribou during late winter and to reduce any displacement of caribou from preferred winter habitats (Adams 1996). Companies operating in caribou range were expected to sequence operations to complete work in more critical caribou habitats first, use additional equipment and crews to compress work activity into allocated time periods, commence operations as soon as frost conditions exist, plan winter work early, and provide an activity schedule with a Caribou Protection Plan.

Implementation of the ‘early in early out’ philosophy varied across northern Alberta. The Northwest guidelines did not specify dates for the ‘early in early out’ operations. It was left up to each company to sequence operations to complete work in caribou habitat early

in the winter. The amount of work and activity schedules were included within each company's Caribou Protection Plan and were reviewed by Alberta Land and Forest Service staff. The Northeast guidelines set the dates between March 1 and June 15 for all exploration and development activities in key caribou habitat to cease. In some circumstances, such as adverse weather and equipment failure, activities were allowed past the March 1 deadline (Alberta Environment 1999).

#### **4.3.2 Participants' Evaluation of Proposed Consolidated Guidelines – Questionnaire Results**

The proposed consolidated industrial operating guidelines attempted to amalgamate all of the existing regional guidelines, reflect accumulated knowledge from the BCRP and address the cumulative effects of industrial development within caribou range. Participants' comments from the questionnaire on the potential of the proposed consolidated guidelines to accomplish these objectives are presented in tables to facilitate organization and comparison (Appendix 2). The information was compiled into categories that are consistent with the organization of the questionnaire: the recovery of existing disturbances on caribou range; the management of new industrial activity on caribou range; management of the amount, spatial extent, distribution and timing of industrial activity within caribou range; comparison of the proposed consolidated guidelines with existing regional guidelines in terms of being able to protect caribou and their habitat; and other general comments and recommendations that were received by participants. Participants' recommendations for improvement of the proposed consolidated guidelines are included.

##### ***4.3.2.1 Recovery of Existing Disturbances***

Only two representatives, one from Alberta Lands and Forest Service (LFS) and the other from the Alberta Energy and Utilities Board (EUB), were satisfied with the potential of the proposed guidelines to encourage the recovery of existing peat harvesting areas on caribou range (Table 4.2). The majority of representatives were not satisfied with the

potential of the proposed consolidated guidelines to address the recovery of existing disturbances in caribou range (Table 4.2).

**Table 4.2.** Participants' responses to the potential of the proposed guidelines to address the recovery of existing disturbances on caribou range.

| <b>Disturbance Type</b> | <b>Satisfied</b> | <b>Partially Satisfied</b> | <b>Not Satisfied</b> | <b>No Response</b> |
|-------------------------|------------------|----------------------------|----------------------|--------------------|
| Roads                   | 0                | 2                          | 14                   | 1                  |
| Pipelines               | 0                | 2                          | 14                   | 1                  |
| Seismic Lines           | 0                | 2                          | 15                   | 0                  |
| Cutblocks               | 0                | 1                          | 14                   | 2                  |
| Peat Harvesting Areas   | 2                | 2                          | 11                   | 2                  |

The representative from the conventional gas sector commented that the proposed guidelines address the recovery of all existing disturbance back to its natural state but they need to be more specific as to how this will be done (Appendix 2). One representative from the geophysical sector commented that the proposed guidelines partially address the recovery of existing roads, pipelines, seismic lines, cutblocks and peat harvesting areas by limiting access thus enabling natural regeneration to occur (Appendix 2).

Some variation in opinions existed between members of the same government department and industry sector (Appendix 2). Two LFS representatives expressed differences of opinion with regards to the potential of the proposed consolidated guidelines to encourage the recovery of existing peat harvesting areas to their natural state. One representative commented that the proposed consolidated guidelines did not address the recovery of existing peat harvesting areas and the other representative commented on how the proposed consolidated guidelines addressed the recovery of peat harvesting areas by specifying that peat harvesting areas be returned to functioning wetlands. Representatives of the geophysical sector expressed differences of opinion with regards to the potential of the proposed consolidated guidelines to encourage the recovery of existing seismic lines. One geophysical representative commented that the proposed consolidated guidelines partially addressed the recovery of existing seismic

lines while the other representative stated that the proposed consolidated guidelines did not address how these may be recovered to their natural state.

#### 4.3.2.2 *Management of New Development*

The majority of representatives were not satisfied with the potential of the proposed consolidated guidelines to manage new roads, pipelines, seismic lines and cutblocks occurring within caribou range (Table 4.3). However, the majority of representatives were satisfied with the section of the proposed guidelines that addressed the management of peat harvesting areas (Table 4.3).

**Table 4.3.** Participants' responses to the potential of the proposed guidelines to manage new development in caribou range.

| <b>Development Type</b> | <b>Satisfied</b> | <b>Partially Satisfied</b> | <b>Not Satisfied</b> | <b>No Response</b> |
|-------------------------|------------------|----------------------------|----------------------|--------------------|
| Roads                   | 3                | 4                          | 7                    | 3                  |
| Pipelines               | 3                | 3                          | 9                    | 2                  |
| Seismic Lines           | 3                | 5                          | 8                    | 1                  |
| Cutblocks               | 1                | 1                          | 12                   | 3                  |
| Peat Harvesting Areas   | 9                | 3                          | 2                    | 3                  |

Representatives from LFS (n = 1), EUB (n = 1), conventional gas (n = 1), geophysical (n = 1) and an environmental consultant (n = 1), responded that the proposed consolidated guidelines partially addressed the management of various types of industrial activity within caribou range but more specific details are required for management to be successful (Appendix 2).

#### 4.3.2.3 *Management of the Amount, Spatial Extent, Distribution and Timing of Industrial Activity Within Caribou Range*

The majority of representatives were satisfied with the potential of the proposed guidelines to plan and co-ordinate activity within caribou range (Table 4.4).

Representatives commented that the planning and co-ordination of activity was being addressed or partially addressed through the requirements of Caribou Protection Plans

(Appendix 2). However, the majority of representatives were not satisfied with the potential of the proposed guidelines to manage the amount, spatial extent, distribution and timing of industrial activity within caribou range (Table 4.4).

**Table 4.4.** Participants' responses to the potential of the proposed guidelines to plan and co-ordinate activity and manage the amount, spatial extent, distribution and timing of industrial activity within caribou range.

| Activity Type  | Satisfied | Partially Satisfied | Not Satisfied | No Response |
|--|-----------|---------------------|---------------|-------------|
| Planning and Co-ordination of Activity   | 10        | 2                   | 5             | 0           |
| Management of Amount, Spatial Extent and Distribution of Activity Within the Range | 0         | 2                   | 15            | 0           |
| Timing of Industrial Operations Within the Winter Within the Range                 | 5         | 0                   | 11            | 1           |

Representatives had different reasons for not being satisfied with the timing constraints (Appendix 2). The two representatives of the geophysical sector commented that the timing constraints imposed by the proposed consolidated guidelines were too strict on industry. The other nine representatives commented that timing constraints were not strict enough for the protection of caribou during critical periods such as calving.

Some variation in opinions existed between representatives of the same sector (Appendix 2). There was disagreement between representatives of the timber sector and between the two industry scientists on whether the proposed consolidated guidelines satisfactorily addressed planning and coordination of industrial activity in caribou range. The timber representatives also disagreed on the ability of timing constraints to manage the industrial activity on caribou range. One timber representative commented that timing does not work and that managing the cumulative amount of activity is more important. The other representative commented that the timing constraints were useful and should be implemented to see if they would be successful in managing activity levels.

#### 4.3.2.4 *Guideline Comparison*

Where representatives were unfamiliar with individual regional guidelines, no comments were received (Table 4.5). Representatives from the conventional gas ( $n = 1$ ) and geophysical industries ( $n = 1$ ) were the only ones to comment that the proposed consolidated guidelines were an improvement over all of the existing regional guidelines regarding the protection of caribou and their habitat (Appendix 2).

**Table 4.5.** Participants' responses regarding the comparison of the proposed consolidated guidelines with existing regional guidelines.

| <b>Guideline</b> | <b>Improvement</b> | <b>Partially Improved</b> | <b>Not Improved</b> | <b>No Response</b> |
|------------------|--------------------|---------------------------|---------------------|--------------------|
| Northwest        | 2                  | 1                         | 8                   | 6                  |
| Northeast        | 2                  | 0                         | 8                   | 7                  |
| Red Earth        | 2                  | 0                         | 6                   | 9                  |
| Slave Lake       | 4                  | 0                         | 3                   | 10                 |

#### 4.3.3 **Management Alternatives Proposed by the BCRP – Key Informant Interview Results**

Five scenarios were proposed by the BCRP for managing the industrial development on caribou range as alternatives to existing timing constraints that have been established through the regional guidelines. Interviewees were asked to choose between scenarios or suggest other scenarios that would address the management of industrial activity on caribou range. The scenarios included full protection of caribou ranges, i.e., with no industrial development (Fig. 4.2), unrestricted industrial development in all ranges (Fig. 4.3), protection of some ranges in northern Alberta with unrestricted development of others (Fig. 4.4), spatial and temporal rotation of industrial activity within each caribou range (Fig. 4.5), and a limited amount of activity within each range (Fig. 4.6).

#### **4.3.3.1    *Scenario #1 – Full Protection of Caribou Ranges With No Industrial Development***

The first scenario involves full protection of caribou range with no industrial development (Figure 4.2). This scenario is inconsistent with the vision statement of the BCC Terms of Reference “to maintain woodland caribou in Alberta’s boreal ecosystem while maintaining opportunities for resource development” (Boreal Caribou Committee 1999). Five of eleven interviewees commented on scenario #1. It was not preferred by any of the respondents (Appendix 2). Their comments can be summarized in three statements:

- 1) The scenario fails to consider humans as part of the ecosystem (environmental consultant).
- 2) It does not acknowledge that the modern economy dictates that resource development must occur (conventional gas).
- 3) It is not realistic in relation to the mandate and policies of the provincial government, which encourage resource development rather than protecting large areas of the province from development (LFS, NRS, Alberta Resource Development).



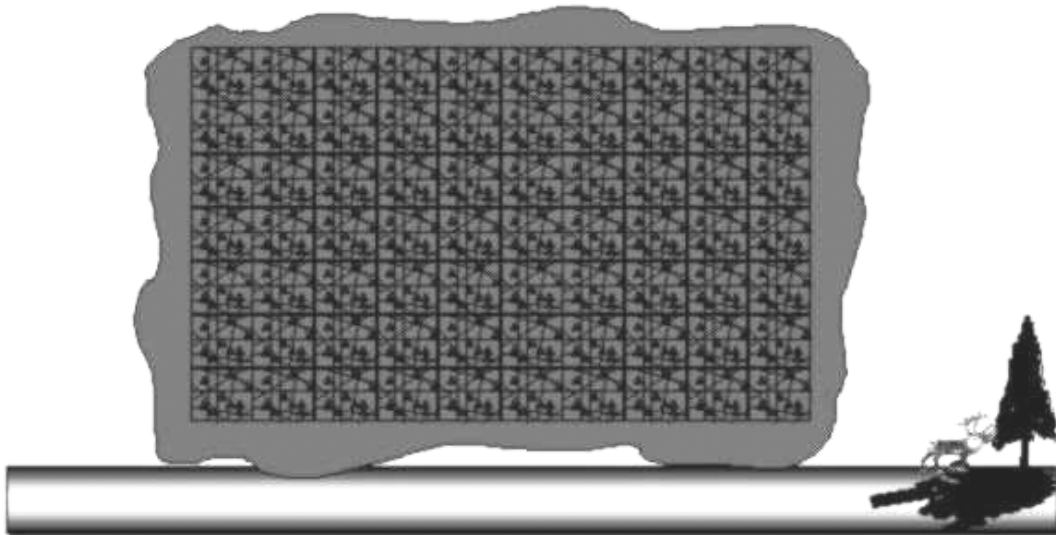
**Fig. 4.2.** Scenario #1 - No development in caribou ranges in northern Alberta.



#### 4.3.3.2 *Scenario #2 – Unrestricted Industrial Development in All Caribou Ranges*

The second scenario involves no protection of caribou ranges, with unlimited industrial development (Figure 4.3). This scenario also conflicts with the BCC Terms of Reference vision statement. Three of eleven interviewees commented on scenario two. It was not preferred by any of the respondents (Appendix 2). Their comments are summarized in the following statements:

- 1) This scenario does not make sense. There is a need to look after our environment (LFS).
- 2) This scenario is not politically smart since it does not take into account the interests of NGOs and environmental groups (Alberta Resource Development).
- 3) Industry representatives recognize that it's in industry's best interest to be concerned about caribou and endangered species. International markets and industry shareholders are dictating that companies must be concerned about the environment if they are going to be successful (pipeline industry).



**Fig. 4.3.** Scenario #2 – Unlimited industrial activity throughout caribou range. Small triangles represent wellsites and cutblocks; lines represent linear corridors.

#### **4.3.3.3     *Scenario #3 – Protection of Some Caribou Ranges While Allowing Unrestricted Industrial Development in Others***

The third scenario involves complete protection of some ranges from industrial activity while others are offered no protection at all or are “written off” (Figure 4.4). This scenario would involve prioritizing ranges for protection based on current amount of industrial activity, amount of available caribou habitat and caribou population trends. Seven of eleven interviewees commented on scenario three. It was not preferred by any of the respondents (Appendix 2). Their comments are summarized in the following statements:

- 1) Scenario #3 won’t work because no one wants to be responsible for “writing off” an area and extirpating the caribou from it (NRS, pipeline).
- 2) Scenario #3 could be improved by identifying key or critical caribou habitat, such as calving grounds, and distinguishing between critical and non-critical habitat. Industry could operate with some guidelines in the broad habitat but have strict protection and allow no access or disturbance in the key habitat (LFS).
- 3) Scenario #3 won’t work because you are excluding large portions of land from any industrial development and the resources that this land contains may be valuable (Alberta Resource Development).
- 4) Scenario #3 might work but we don’t know how big the protected area would have to be for caribou, how much society would like it to be protected and how much it will cost in terms of lost revenues and jobs (conventional gas).



**Fig. 4.4.** Scenario #3 – Total protection of some ranges while allowing unlimited industrial activity on others.

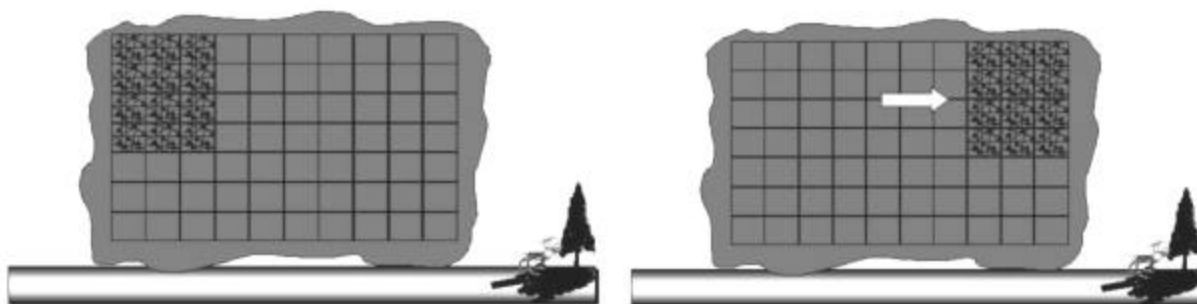
#### **4.3.3.4     *Scenario #4 – Spatial and Temporal Rotation of Industrial Activity Within Each Caribou Range***

The fourth scenario designates a portion of the caribou range for industrial development at one time (Figure 4.5). All types of industry (e.g., oil and gas, geophysical, pipeline, timber, and peat) can work in the designated portion of the range. Industrial development can occur on another portion of the range once the designated portion is fully restored to caribou habitat. Eight of eleven interviewees commented on scenario four. It was not preferred by any of the respondents (Appendix 2). Their comments are summarized in the following statements:

- 1) Scenario #4 won't work because you have dollar driven industries that need to progress to support themselves. As technology improves it's only going to extend the life of some of these heavy oil fields (LFS).
- 2) Scenario #4 won't work very well because caribou need to use their entire range for predator avoidance and foraging. There are also too many industries working at different temporal and spatial scales for them to rotate through a range in unison. Also, as new technology develops, the oil and gas industry will want to go back to

some older wells to extract more resource (NRS, Alberta Resource Development, pipeline).

- 3) Scenario #4 will be difficult to work because it takes so long for an area to be fully reclaimed, depending on whose definition of reclaimed or restored you are using (EUB).
- 4) Scenario #4 would work for forestry but not for the oil and gas industry (environmental consultant, conventional oil).
- 5) All the oil and gas deposits are not under the earth in little pools and pockets that are easily identified and extracted. Our industry is regulated to extract oil or natural gas from the earth in the most efficient way possible. Scenario #4 would not allow us to extract these deposits in the most efficient manner because of its spatial and temporal limitations (conventional gas).

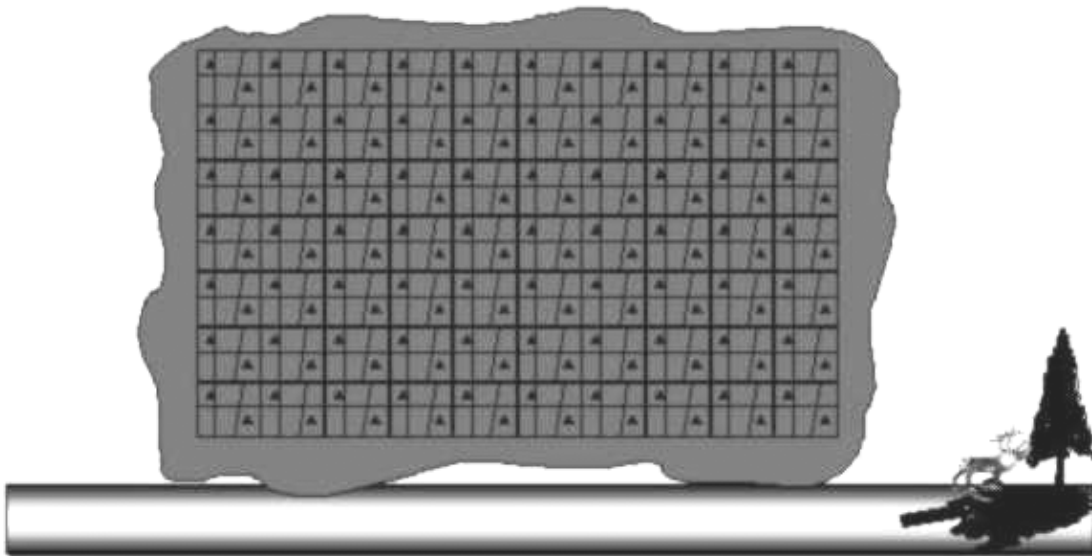


**Fig. 4.5.** Scenario #4 – Rotation of industrial activity through range.

#### **4.3.3.5      *Scenario #5 – Limited Amount of Activity in Caribou Ranges***

In the fifth scenario, the whole caribou range is available for industrial development, however a limit is placed on the amount of development that can occur within the range (Figure 4.6). These limits would be based on current scientific analysis of caribou's response to industrial activity and modelling of the cumulative effects of this activity on caribou. Nine of eleven interviewees commented on scenario #5. It was preferred by six of the nine respondents (Appendix 2). Their comments are summarized in the following statements:

- 1) Scenario #5 provides the best opportunity for the protection of woodland caribou while maintaining some level of industrial activity in their range. Cooperation between industry and regulators is necessary for this scenario to work properly (LFS, NRS, environmental consultant, peat, timber).
- 2) Scenario #5 is great on paper but so far we haven't really seen that kind of thing employed, certainly not in Alberta. This scenario is really dependent on the economic climate (EUB).
- 3) Scenario #5 is probably the most realistic. There are problems in managing this because we don't have definitive ideas about population, habitat and how much habitat we need for caribou (Alberta Resource Development).
- 4) Scenario five will not work until we can deal with setting limits on the amount of industrial activity for each range (pipeline).



**Fig. 4.6.** Scenario #5 – Limited industrial activity throughout caribou range.

Participants were also encouraged to suggest other models that they think would be effective in managing industrial activity within caribou range. Two other means of managing industrial activity on caribou range were suggested, these being combinations of scenario #5 with another scenario (Appendix 2). The EUB and conventional oil

representatives preferred a combination of scenario #3 (total protection of some ranges, unlimited industrial activity on others) and scenario #5 (limited industrial activity throughout all caribou ranges). The representatives commented that having protected areas for caribou (scenario #3) would ensure that caribou continued to exist in Alberta even if a regulated amount of industrial activity on their range (scenario #5) did not prove to be effective. The representative from the pipeline industry sector preferred a combination of scenario #4 (spatial and temporal rotation of industrial activity through caribou range) and scenario #5 (limited industrial activity throughout all caribou ranges). Industrial activity would be focused on one area of the range (scenario #4) but not be so rigid as to not allow some limited industrial activity outside of that area at a much reduced scale (scenario #5). This type of scenario would allow some industries to survive financially during the time that they must wait, until they are allowed to develop another portion of the range more intensely. The representative from conventional gas suggested the intensive management of caribou populations rather than managing the amount of industrial activity on caribou range. This could be done through enhancing the breeding stock of a population to ensure genetic success and displacing predators such as wolves from the caribou range.

## **4.4 DISCUSSION**

The inconsistent participation of sector representatives on the Guidelines Subcommittee resulted in incomplete representation in the questionnaire and the key informant interviews. The pipeline, heavy oil, conventional oil, peat, and Alberta Resource Development representatives did not respond to the questionnaire. Only two (geophysical and conventional gas) of the possible five oil and gas industries responded to the questionnaire (Table 4.1). This made it difficult to compare comments between sectors in the same industry or between government departments. Consequently, the evaluation of the proposed consolidated guidelines did not adequately represent the views and opinions of the oil and gas industry. In addition, the peat sector was not adequately represented in the evaluation. The representatives of the peat sector may have a unique

perspective to offer because they are just beginning to develop operations in caribou habitat in which the existing industrial operating guidelines apply.

There were several possible reasons for the inconsistent participation of sector representatives in the BCC Guidelines Subcommittee. Individual representatives may have changed roles within a department or company or completely changed departments or companies and were no longer able to attend the meetings. Others may not have been able to make the time commitment that was required to attend all meetings. Participant observations revealed that the meetings were poorly organized (Chapter 3). There often was no agenda set for the next meeting and minutes were not taken. Many representatives were frustrated with this lack of organization of the Subcommittee (Chapter 3).

I conclude that had the BCC Guidelines Subcommittee been more organized and not have required such a large time commitment from its members there would have been an increase in attendance and more complete representation of all sectors when responding to the questionnaire.

#### **4.4.1 Questionnaire – Participants’ Evaluation of Proposed Consolidated Guidelines**

The questionnaire involved participants’ evaluation of the consolidated industrial operating guidelines. The BCC determined the nature of the evaluation and excluded an independent evaluation. While members of the BCC were most familiar with the issues involving caribou and industrial operating guidelines it may have also been useful to involve experts who were not members of the BCC. Thompson and Wilson (1994) recommend that the best environmental auditing teams are comprised of external consultants and in-house staff. External consultants provide objectivity, a “fresh set of eyes”, and may be able to recommend new ideas, while in-house staff have specific technical knowledge of the issues and have better access to information. An auditing team with this structure may have had a better chance of providing an objective review

and creative solutions than was achieved through the self-evaluation carried out by the BCC. **An external organization should have been involved in evaluating the proposed consolidated guidelines. This may have enhanced the validity and decreased any internal biases that BCC members may have formed during the BCC meetings and the guidelines evaluation process.** In analogy, Brooks (1997) argued for peer review to reduce internal biases and to increase the validity of habitat models used to assess environmental impacts.

In general, there was dissatisfaction among participants with the potential of the proposed consolidated guidelines to encourage the recovery of existing industrial disturbances (i.e., roads, pipelines, seismic lines, cutblocks, and peat harvesting areas) to a natural state within caribou habitat (Table 4.2).

Existing linear disturbances (roads, pipelines, seismic lines) in woodland caribou range have been shown to result in functional habitat degradation (Dyer 1999). James (1999) reported that caribou mortality attributable to wolf predation occurred closer to linear corridors than live locations of radio collared caribou, suggesting that caribou closer to linear corridors experience a higher predation risk. Dyer (1999) reported that caribou used areas within 100 metres to 1000 metres of different developments in different seasons significantly less than expected. Using conservative estimates of the spatial distribution of linear corridors in several northern caribou ranges, one can extrapolate the potential area of reduced caribou use relative to human developments (Dzus 2001). Based on an area of 250 m, the percentage of habitat affected in several northern Alberta caribou ranges varies from 28% to 70% of total range area (Dzus 2001).

Woodland caribou in northern Alberta tend to use peatland complexes (Bradshaw et al. 1995, Stuart-Smith et al. 1997) and may be considered as metapopulations. Hanski and Gilpin (1991) defined metapopulations as “systems of local populations connected by dispersing individuals.” Movement of caribou between peatland complexes has been detected in northeastern Alberta (Bradshaw 1994, Stuart-Smith et al. 1997). Habitat



fragmentation by linear disturbances between peatland complexes could have significant implications for the viability of woodland caribou populations in northern Alberta (Dyer 1999).

The proposed industrial operating guidelines for caribou range have not addressed the recovery of existing linear disturbances to reduce the amount of functional habitat degradation and fragmentation. Early in the guidelines review process the BCRP made recommendations to the BCC Guidelines Subcommittee. These recommendations included rehabilitation of existing anthropogenic disturbances that are not currently being used by industry within caribou range to reduce functional habitat degradation and fragmentation (Boreal Caribou Research Program 2000a). The participants' evaluation of the proposed consolidated guidelines suggests that these recommendations have not been adequately addressed.

I wish to highlight three of the recommendations that were offered by participants in the evaluation for improving the potential of the proposed consolidated guidelines to achieve the recovery of existing industrial disturbances. Other recommendations are found in Appendix 2.

- 1) An inventory of existing disturbances (e.g., roads, pipelines, seismic lines, cutblocks, and peat harvesting areas) within caribou range is required to identify disturbances that are not being used on a regular basis by industry. This information could be used to guide access management and reclamation planning, policy development and subsequent implementation.**
- 2) For many disturbances, the company that initially created them is not known. Therefore the guidelines should identify a cost-share program for rehabilitation of existing disturbances between government and companies that are currently operating in woodland caribou range.**
- 3) Any companies creating new industrial disturbances within caribou range should submit their plans in a digital format to the provincial regulators. This**

**would make it easier to analyze the total amount of industrial disturbance on caribou range and to potentially forecast the cumulative effects of this disturbance.**

The BCC has already taken steps to address the first recommendation. The BCRP has submitted an application to the federal Habitat Stewardship Program to start a project aimed at speeding the recovery of existing seismic lines and pipelines. The project will demonstrate and evaluate means of speeding the recovery of the existing industrial footprint on the landscape (Boreal Caribou Research Program 2000b). The project team will work in three or four pilot project areas throughout northern Alberta and will be comprised of members from industry, LFS, and NRS (B. Wynes, pers. comm.). The project team will gather information such as a basic vegetation inventory of the project area, the number of linear corridors and the amount of re-growth on the corridors. Local hunters, trappers and recreationalists groups within each pilot project area will be consulted to start building an access management plan (B. Wynes, pers. comm.). Treatments on seismic lines as well as active pipelines will be implemented to speed the full or partial re-vegetation.

The majority of participants were not satisfied with the potential of the proposed consolidated guidelines to manage new roads, pipelines, seismic lines, and cutblocks occurring within caribou range (Table 4.3).

The majority of respondents, 12 of 14, recognized that the proposed consolidated guidelines did not address the management of new cutblocks (forestry). The proposed consolidated guidelines did not address this issue because cutblocks are typically located in upland habitat not frequented by caribou. Their reforestation procedures are already regulated through the Alberta Forests Act. Although woodland caribou are not currently at risk from large-scale forestry operations in their habitat, they may be at risk from indirect effects of timber harvesting of upland areas adjacent to peatland complexes (Dzus 2001). Timber harvesting of upland areas adjacent to lowland habitat occupied by

caribou may also increase predation pressure on caribou. This alteration from old forest stands to young successional forests allows for the increase of moose and deer populations that feed on the regenerating browse (Kelsall 1984, Hristienko 1985, James 1999). In turn, the wolf population is expected to increase with moose density thus increasing the incidental predation pressure on caribou (Cumming 1992). As moose density declines with forest succession there will be a time lag in the wolf population response and the abundant wolves may turn towards alternative prey such as caribou (James 1999, Rettie & Messier 2000). There has not been an evaluation of the potential for forestry related disturbances in upland areas to fragment caribou range and its effects on metapopulations in Alberta.

In British Columbia, Brown et al. (1994) has described a multiple accounts decision support method which links GIS and production models for addressing trade-offs between timber and non-timber values to facilitate evaluation and comparison of different management scenarios. Stakeholders could use such a model to evaluate multiple forest harvesting scenarios and their impacts on caribou habitat or areas immediately surrounding caribou habitat.

With the exception of the peat industry, the proposed consolidated guidelines did not specify cumulative effects considerations (Appendix 3). Representatives were most satisfied with the potential of the proposed consolidated guidelines to manage new peat harvesting areas in caribou range (Table 4.3). The section in the proposed consolidated guidelines on peat harvesting differs from other sectors by identifying the long-term goals of the peat industry and the recommendation to develop a working group of representatives from the BCRP, NRS and the peat industry (Appendix 3). It was hoped that this working group could develop 'tangible plans' for the peat industry that could be used in cumulative effects modeling. This is the only section of the guidelines that mentions cumulative effects and the possibility of using a cumulative effects model to aid in managing industrial activity. Boreal Caribou Research Program (2000a) recommended

that a cumulative effects assessment is essential for all human activities occurring within caribou ranges.

The majority of representatives were not satisfied with the potential of the proposed guidelines to manage the amount, spatial extent, distribution and timing of industrial activity within caribou range (Table 4.4). Timing constraints were introduced in the existing regional guidelines to minimize metabolic stress on caribou during late winter, and to reduce displacement of caribou from preferred winter habitats. The birth weight of calves is correlated with the weight of the mother in late pregnancy (Adams 1996). The survival of newborn calves is dependent upon the mother's nutrient uptake and overall condition during late pregnancy (Adams 1996). If the new timing constraints proposed in the consolidated guidelines were implemented they would result in some industry sectors being able to work later in the season than others (Appendix 3) and some industrial activity would be allowed within caribou range until spring breakup. This contradicts the concept of minimizing metabolic stress on caribou during late winter. Under the proposed timing change industry sectors would each operate at different time frames within the overall operating season (Appendix 3). The rationale for changing the time constraints for each industry sector and allowing some activities to continue into the spring was unclear to some sector representatives (Appendix 2).

Geophysical sector representatives commented that although the proposed timing constraints would result in a shorter time frame for their sector to operate, companies would have to increase their activity within that period to complete their work (Appendix 2). Thus, the proposed timing constraints would not be effective in managing the amount, spatial extent and distribution of industrial activity within caribou range. Recommendations for improvement provided by the majority of representatives included the need for the proposed guidelines to address the management of the cumulative amount of industrial development in caribou range (Appendix 2). A cumulative effects modeling tool is urgently needed to facilitate evaluation and comparison of different management scenarios at spatial scales relevant to caribou.

With the exception of the Slave Lake guidelines, the proposed consolidated guidelines are not an improvement over existing regional guidelines in terms of protection of caribou and their habitat (Table 4.5). Many representatives were unfamiliar with the Slave Lake and Red Earth guidelines and did not give responses when comparing the proposed consolidated guidelines to them (Table 4.5).

The proposed consolidated guidelines would remove the commitment that was made in the Northwest guidelines to disallow any permanent access roads outside of existing activity areas. This is not a progressive decision in terms of caribou conservation. Furthermore, the consolidated guidelines adopted the Infield Zone and Outfield Zone definitions of areas that contain heavy oil development (Appendix 3). The addendum to the Northwest guidelines (Appendix 3) (Alberta Environmental Protection 1996) states, “The high intensity development area (Infield Zone) should not be managed to protect caribou until the majority of the oil production was completed. At this time reclamation would restore the area to usable caribou habitat.” The Infield Zone could expand every year as new boundaries are drawn around it. Based on current technology it could take hundreds of years to restore peatland complexes to usable caribou habitat after they have been disturbed. Lichens such as *Cladina spp.* and *Cetraria spp.* (preferred caribou forage) are slow to regenerate following disturbance (Thomas et al. 1996). Species of lichens attain peak biomass at different periods after fire - as early as 40-60 years for *Cladonia spp.*, and 150 years for *Cladina rangiferina* and *Cetraria nivalis*. Lichen genera differing in growth rate following disturbance could seriously affect utilization by caribou and should be taken into account in the estimation and management of caribou range (Snyder and Woodard 1992).

The proposed consolidated guidelines failed to address the management of the total amount, intensity and duration of industrial development in caribou range, and need to be amended to ensure sound management of caribou habitat. The proposed guidelines need to address the management of the cumulative amount of industrial development in

caribou range so that Infield Zones do not expand to the size of the entire caribou range (a theoretical possibility).

The BCRP recommended that the consolidated guidelines address the total amount, intensity and duration of industrial development in caribou habitat (Boreal Caribou Research Program 2000a). They also recommended that conservative interim limits to development be considered until disturbance thresholds can be calculated. Overall, the proposed consolidated guidelines did not address these threshold recommendations. Representatives from both government and industry commented that the proposed consolidated guidelines failed to address the management of the cumulative amount of industry activity within caribou range (Appendix 2). Both industry scientists, an environmental consultant and a NRS representative commented that the proposed consolidated guidelines did not adequately address the list of concerns and recommendations produced by the Research Subcommittee (Appendix 2).

#### **4.4.2 Alberta Government Policy Barriers To Managing Industrial Activity On Caribou Range**

The evaluation of proposed consolidated guidelines identified some weaknesses regarding recovery of existing disturbances, managing new development and managing the total amount of activity on caribou range. The BCC Guidelines Subcommittee representatives and questionnaire participants identified several policy barriers preventing the guidelines from satisfactorily addressing the aforementioned issues. The following provincial government policies need to be revised so that the guidelines can appropriately address these issues.

##### **4.4.2.1 *Alberta Land and Forest Service Policy on Closure of Existing Access***

Under existing regulations, if on-highway vehicles use an access route, then a ministerial order is required to block public access (Alberta Lands and Forest Service representative, pers. comm.). The closure would require public involvement of interest groups in the

area (trappers, hunters, recreationalists). Closure of access within a License of Occupation (LOC) is addressed in the regulations. Alberta Regulation 54/2000, (Province of Alberta 2000) states, “The Minister may, with the consent of the holder of a licence, close a road for any period of time that the Minister considers appropriate to all vehicles except:

- (1)(a) vehicles operated on behalf of the licensee, and
  - (b) vehicles operated on behalf of a commercial user entitled to use the road
- (2) If a road is closed pursuant to subsection (1), the holder of the licence shall erect prominent signs at each access point to the licensed area and at any other point prescribed by the Minister advising of the closure and the reason for it.”

Access routes frequently remain active because of the inability of signs to restrict people or the reluctance of the provincial government to embark on a public collaborative program that is required to close many access routes (Alberta Land and Forest Service representative, pers. comm.).

The accumulation of linear features (roads, pipelines, seismic lines, cutblocks, and utility corridors) and other industrial disturbances (cutblocks, peat harvesting areas, well sites and infrastructure), and increased public access can affect caribou through increased predation (Stuart-Smith et al. 1997, James 1999), reduced use of some habitat from disturbance effects (Cameron 1983, Cronin et al. 1994, Cameron et al. 1995, Dyer 1999) and increased hunting (Alberta Environment 1998). Reforestation or re-vegetation of linear disturbances used as public or industry access corridors cannot occur unless access is blocked. **An access management plan should be developed for areas in caribou range in collaboration with all interest groups (see previous section, 4.4.1). An inventory of existing access corridors used by hunters, trappers and recreationalists is required. Upon collaborative public involvement, Alberta Land and Forest**

**Service could determine which corridors may be blocked and rehabilitated and which ones need to be kept open.**

#### **4.4.2.2     *The Pipeline Act***

The Pipeline Act states that a ““controlled area” means a strip of land on each side of a pipeline within the distance or distances from the pipeline prescribed in the regulations and, without limitation, includes land that comprises the right of way held for the construction of a pipeline or incidental to the operation of a pipeline” (Province of Alberta 1980). This act also states, “the controlled area is (a) a strip of land 30 metres wide on each side of the pipeline, or (b) the distance from the pipeline to the edge of the right of way, whichever is wider.”

During BCC meetings it was revealed that with recent technologies this right-of-way (ROW) width is not always required when putting in a pipeline. **ROW widths need to be kept to a minimum through caribou range where recovery may take decades. The fewer disturbances that are made on the landscape, the more rapidly disturbances will recover. A reduction in ROW width may also help to reduce habitat fragmentation by these linear disturbances between peatland complexes.**

#### **4.4.2.3     *Posting of Land Sales***

Land sales are industry driven. Currently, if an industrial operator requests a parcel of land to be posted for sale they submit a posting request to Alberta Resource Development. After posting requests are accepted a public offering notice, which lists all the lands that are going to be sold, is published seven weeks later (Alberta Resource Development representative, pers. comm.). If these lands are in caribou range the public offering notice have addenda attached. The addenda identifies that the land is in caribou range and that it is subject to specific operating conditions. There is an eight-week break after the public offering notice before a sale actually occurs. This eight-week break gives companies an opportunity to look at the land postings to determine whether they want to



bid on the parcels. Companies may initiate some seismic programs in the posted area to get a better understanding of geologic formations. There is approximately a 15-week window between the time that a request for posting is received and the land lease is granted. There are no limits on how much land can be leased in a specific area. If ten companies request parcels in the same area they can all be leased (Alberta Resource Development representative, pers. comm.). Leases can be quite large and they may all fall in one area, depending on industry requests.

When a company buys the subsurface rights to a parcel of land they have an obligation to drill within five years, depending on the area. Most companies drill wells in the last year of the license (Alberta Resource Development representative, pers. comm.). Before they drill the well, a company often gets more specific information through seismic programs to target their drilling locations (Alberta Resource Development representative, pers. comm.). A well does not have to be productive. If a company simply drills a well to test a geologic formation they get to keep the lease, even though the well may be dry (Alberta Resource Development representative, pers. comm.). Sizes of well site leases are dependent on the depth of the well (Alberta Resource Development representative, pers. comm.).

**There needs to be a mechanism to limit the number of parcels of land that can be leased and to limit active exploration or drilling activities in caribou range. One possibility exists in the provision of some kind of incentive to industry so that they won't develop in important caribou habitat (e.g., areas used for calving and including optimal forage).** These important habitat areas would need to be defined. Another possibility would be to provide a rebate to companies that stagger their operations so that they do not occur within a compressed time frame (e.g., stampede in the final year of the lease). Thus far the incentives have been designed to encourage drilling and activity. Incentives or legal mechanisms should be structured so that industrial activity can occur while the amount of activity is limited in caribou range.

**More sharing of geophysical information between companies may help limit the amount of activity occurring on caribou range.** For example, instead of having many different exploratory programs operating in the same area the data from one geophysical program could be shared amongst oil and gas companies, thus reducing the need to duplicate disturbance on the landscape. A database, accessible to all companies operating in caribou range, that contains information regarding roads, utility corridors, seismic line locations, etc. would encourage more sharing of access and corridors.

#### **4.4.3 Key Informant Interviews**

Key informant interviews were employed for evaluating management scenarios. The majority of representatives, from industry and government, favoured scenario #5 (limits to cumulative amount of activity), or a combination of scenario #5 and scenario #3 (write-off areas) or #4 (rotation of activity) as the best means of managing the amount and intensity of industrial activity (Appendix 2). The consolidated guidelines must reflect the need to manage the cumulative amount of activity on caribou range (Boreal Caribou Research Program 2000a). **More elaborate models and decision support tools are needed for designing and evaluating alternatives for managing human activity in caribou range.**

To address the need for a model or decision support tool to help us understand the accumulating effect of natural disturbances and human development on caribou habitat supply and effectiveness, the BCC is currently focused on modeling at two scales: landscape and population. Recently, the BCC has acquired A Landscape Cumulative Effects Simulator (ALCES®) (Stelfox 2000). ALCES® is most useful for comparing the relative effectiveness of various future land use practices, rather than predicting absolute measures of habitat value at some future point in time (Boreal Caribou Research Program 2000b). It provides an excellent opportunity for industrial representatives to evaluate the cost effectiveness of various changes to industrial operating practices in achieving conservation objectives (Boreal Caribou Research Program 2000b). Current BCRP projects, such as evaluation of the avoidance cutting/ low impact seismic line cutting

technique, speeding recovery of existing linear features, and caribou response to linear features and wellsites, can be used to refine the response curves used in ALCES® to make the model even more accurate and useful for evaluating alternatives for managing human activity in caribou range. ALCES® will also help the BCRP understand gaps in current research information and identify the need for future research initiatives.

A Woodland Caribou Cumulative Effects Model (WCCEM) is being developed to predict the responses of Alberta's woodland caribou population to different factors influencing the population, such as anthropogenic and natural (P. Weclaw, pers. comm.).

Anthropogenic factors included in the model are habitat loss from human disturbances (e.g., linear corridors and well sites) and human harvest. Natural factors included in the model are predation, forage availability and climate (Boreal Caribou Research Program 2000b). The model allows users to assess the relative importance of the factors included in the model to the dynamics of the caribou population in the future. WCCEM also allows for the examination of the combination effects of multiple factors, thus allowing it to be used in assessing the impact of cumulative effects on a woodland caribou population (Boreal Caribou Research Program 2000b).

## **4.5 GENERAL RECOMMENDATIONS AND CONCLUSIONS**

Information obtained through the questionnaire and key informant interviews was assumed to be representative of the views of the sectors (government departments, industry sectors and scientists). The provincial government representatives had the responsibility of representing the public interest. However, representatives from the two different government departments (Alberta Environment and Alberta Resource Development) often held different opinions on the management of industrial activity within caribou range. The Department of Resource Development manages mineral rights, administers mineral agreements, collects revenue and royalties, and is an advocate for the energy and mineral sector within government, the province and in dealing with other jurisdictions (Alberta Resource Development 2000). Alberta Environment (2000) stated that the department "will protect, enhance, and sustain our environment through

wise management.” It “will ensure the sustainable development of resources to support a healthy environment, a prosperous provincial economy and a high quality of life for Albertans.” Implicitly, the public should expect that government agencies would represent the full spectrum of public interests, particularly when direct public participation is excluded by design as it was on the BCC (Chapter 3). Consensus on the public interest in developing consolidated industrial operating guidelines for caribou range was difficult because the mandate of one department (to protect, enhance and sustain the natural environment) conflicted with the mandate of another (to advocate for industrial development). At the BCC Guidelines Subcommittee meetings it was unclear what aspects of the public interest should be represented or if certain aspects (e.g., resource development) should be assigned more importance over other aspects (e.g., conservation of caribou).

The public interest in caribou conservation has not been defined in Alberta as clearly as it has in Saskatchewan. Tanguay et al. (1995) conducted a mailout survey to Saskatchewan residents to estimate the value of woodland caribou conservation programs to the public. Contingent valuation methods (CVM) were incorporated into the survey to estimate the value of a proposed woodland caribou conservation program. CVM elicits values from respondents by asking them how much they would be willing to pay for some environmental good, such as caribou, or the minimum amount they would accept in compensation for the good (Tanguay et al. 1995). These value estimates were then examined to determine the benefits to society that would be derived from the implementation of a caribou conservation program in a specific region in Saskatchewan. The authors estimated that Saskatchewan residents placed a value between \$70 and \$233 million for the caribou conservation program. The citizens of Saskatchewan clearly indicated a substantial value on the existence and maintenance of caribou within the province. Tanguay et al. (1995) concluded that not attempting to maintain caribou numbers in Saskatchewan would result in a large loss to its citizens. **I suggest that a caribou conservation program is required for northern Alberta and that a similar survey, using CVM, is needed in Alberta to identify the value that Alberta residents**

**place on such a program. Management of industrial activity within caribou range would be an implicit component of the conservation program. This approach would help to more clearly define the public interest in caribou conservation, place some actual monetary values on the benefits of such a program and would facilitate integration of a broader spectrum of interests in making decisions regarding the management of industrial activity on caribou range.**

In summary, the following recommendations are made to the BCC and its Guidelines Subcommittee for improvements of the proposed guidelines for industrial activity in caribou range. For more extensive recommendations made by questionnaire and interview respondents refer to Appendix 2.

- 1) An external organization should have been involved in evaluating the proposed consolidated guidelines. This may have enhanced the validity and decreased any internal biases that BCC members may have formed during the BCC meetings and the guidelines evaluation process.
- 2) The proposed consolidated guidelines must address the recovery of existing disturbances in caribou range. An inventory of existing disturbances (e.g., roads, pipelines, seismic lines, cutblocks, and peat harvesting areas) within caribou range needs to be created to identify those disturbances that are not being used on a regular basis. The guidelines could then encourage access management and reclamation efforts in these areas. For many of these disturbances, the company that initially created them is not known. Therefore the guidelines should encourage a cost-share program between the government and those companies that are currently operating in woodland caribou habitat. Any companies creating new industrial disturbances within caribou range should submit their plans in a digital format to the provincial regulators. This would make it easier to analyze the total amount of industrial disturbance on caribou range and to potentially forecast the cumulative effects of this disturbance.

- 3) Alberta Land and Forest Service policy on closure of existing access, the Pipeline Act and the posting of land sales are provincial government policies that need to be revised so that the proposed industrial operating guidelines can appropriately address the recovery of existing disturbances, managing new development, and managing the total amount of activity on caribou range.
  - An access management plan should be developed for areas in caribou range in collaboration with all interest groups (see previous section, 4.4.1). An inventory of existing access corridors used by hunters, trappers and recreationalists is required. Upon collaborative public involvement, Alberta Land and Forest Service could determine which corridors may be blocked and rehabilitated and which ones need to be kept open.
  - ROW widths need to be kept to a minimum through caribou range where recovery may take decades. The fewer disturbances that are made on the landscape, the more rapidly disturbances will recover. A reduction in ROW width may also aid to reduce habitat fragmentation by these linear disturbances between peatland complexes.
  - There needs to be a mechanism to limit the number of parcels of land that can be leased and to limit active exploration or drilling activities in caribou range. One possibility exists in the provision of some kind of incentive to industry so that they won't develop in important caribou habitat (e.g., areas used for calving and optimal forage). More sharing of geophysical information between companies may help limit the amount of activity occurring on caribou range.
- 4) The consolidated guidelines must reflect the need to manage the cumulative amount of activity on caribou range. More elaborate models and decision support tools are needed for designing and evaluating alternatives for managing human activity in caribou range.
- 5) I suggest that the value that Alberta residents place on a caribou conservation strategy for northern Alberta be identified. Management of industrial activity within caribou range would be an implicit component of the conservation program. This approach would help to more clearly define the public interest in caribou conservation, place

some actual monetary values on the benefits of such a program and would facilitate integration of a broader spectrum of interests in making decisions regarding the management of industrial activity on caribou range.

Overall the evaluation showed that the proposed guidelines fail to satisfactorily address speeding up the recovery of existing disturbance, minimizing the amount of new development and managing the total amount of activity on caribou range. They have also not improved on the old guidelines in terms of protection of caribou and their habitat. The preceding policy adjustments, recommended modeling tools and specific recommendations for improvement of the proposed consolidated guidelines are necessary steps for the management of the cumulative amount of activity on caribou range.

The BCC has recognized the shortcomings that were pointed out in this evaluation of the proposed industrial operating guidelines for woodland caribou range in northern Alberta. These proposed guidelines (Appendix 3) have not been endorsed by the BCC and a new facilitated guidelines review process was initiated in March 2001. A continued commitment exists from the BCC to develop an adaptive management program where guidelines are periodically reviewed to reflect current knowledge and research on caribou ecology and the effects of human activity.

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## CHAPTER 5

### 5.1 INTRODUCTION

In this chapter, I summarize the recommendations made in Chapters 3 and 4. Recommendations from Chapter 3 are listed before those in Chapter 4 because of the importance of improving on the decision-making process (BCC) before the decisions or outcomes from the process can be improved. These recommendations will lead to increased public satisfaction, soundness and durability of caribou management decisions that are made by the Boreal Caribou Committee (BCC). The limitations identified through participants' evaluation of the consolidated guidelines have led to recommendations for an Alberta government policy revision and a model that will help in the management of amount, duration and intensity of development on caribou range. I finish this chapter with a conclusion for this Master's Degree Project (MDP).

### 5.2 RECOMMENDATIONS

#### 5.2.1 Recommendations for Improvement in the Public Participatory Process within the BCC

The following recommendations would increase the public satisfaction and the soundness and durability of caribou management decisions that are made by the BCC and its subcommittees.

- 1. The Community Participation Subcommittee should be resurrected to ensure that the public is being educated and informed with regard to caribou conservation issues and to ensure that all possible interest groups (e.g., Aboriginal groups, environmental groups, local business groups) are involved in the decision-making process.**

The long-term conservation of caribou will require awareness and participation of local wildlife and recreational vehicle clubs, wildlife managers and Aboriginal communities.

This commitment to more community participation will also lead to increased public satisfaction of caribou management decisions.

- 2. All new members of the BCC should receive an orientation that includes information on historical and current status of the woodland caribou, research summaries and current management strategies that are being employed for the protection of this ungulate.**

There is currently no orientation process for new members who become involved with the BCC. Recently, both government and industry stakeholders have experienced “downsizing” and merging of departments or companies. These processes have resulted in changing corporate environmental managers and regulators who are unfamiliar with the BCC. New members must rely on information that is passed on to them by their company, agency, department, etc. These new members are frequently misinformed or lacking information regarding previous, current and future woodland caribou research initiatives, industrial operating guidelines and public communications. This recommendation would ensure that all new members are well informed and have the knowledge to be involved in management decisions that are made at the committee or subcommittee level.

- 3. All stakeholder interests should be involved in the decision-making process and the blend of scientific and public values should be restricted to more fully incorporate public values into a collaborative environmental decision-making process.**

The BCC needs to set more feasible and measurable objectives that include woodland caribou population density, habitat and human development or economic objectives for caribou range in northern Alberta. The full range of public values needs to be reconciled as the basis for these objectives. Gaining the involvement of all stakeholders in the BCC would ensure a truly collaborative approach to managing a public resource. Technical expertise should be provided by the BCRP for evaluating the feasibility of technical

objectives and predicting the consequences of management alternatives. Scientific values should not be allowed to blend with public values during the decision-making process.

**4. A stronger commitment should be sought from all participating stakeholders and interest-based negotiations should be used to increase the innovativeness and quality of decisions made by the BCC Guidelines Subcommittee.**

A strong commitment or “buy-in” from all participating stakeholders is necessary to address the alternate or innovative ideas and the barriers that are blocking their implementation. Furthermore, the principles of interest-based negotiations, such as separating the people from the problem, focusing on interests and not positions, inventing mutual options for mutual gains, and using objective criteria to agree on options (Chapter 2), should have been utilized during the BCC Guidelines Subcommittee meetings to aid in addressing the innovative ideas and the barriers that are blocking their implementation. In addition, some provincial government policies, that posed barriers to the implementation of new or innovative ideas, need to be revised (section 5.2.2).

**5. Trust is an important factor in the public participation forum and it should be attained between stakeholders, and between stakeholders and the public before meaningful decisions or guidelines can be accomplished.**

One of the most effective ways to gain public trust is to involve and empower the public in decision-making. Thus far, input from all stakeholders has been excluded from the decision-making process within the BCC. Resurrection of the Community Participation Subcommittee would be one way to start getting public interest groups involved in the decision-making process.

In order to follow the principles of interest-based negotiation and build trust between stakeholders, each sector (i.e., industry, government, and university) should have consistent representation in the type and number of participating stakeholders at each BCC meeting. Building of trust between participants should have started at the formation

of the BCC Guidelines Subcommittee. Trust is built on respect and understanding of each other's interests. Guidelines Subcommittee participants should have focused on interests rather than positions (Chapter 2) and sought to discover the motivations behind each party's positions. Participants should have come to see themselves as working side by side, attacking the problem, not each other's position.

One factor that led to lack of trust among some participants of the Guidelines Subcommittee is the inconsistency by regulators when enforcing guidelines in caribou ranges. To avoid this problem, guidelines need to be written clearly and concisely so that they can be easily understood. Secondly, the government needs to hold workshops with all of its regulators and industrial operators to answer any questions regarding the guidelines and ensure that they are enforced consistently throughout the province.

**6. The BCC Guidelines Subcommittee needs a capable facilitator or chairperson to guide the dispute resolution process and ensure that the goals and objectives of the committee are achieved within a timeline.**

A capable facilitator or chairperson can aid a committee by helping to solve disputes and ensuring that the goals and objectives of a committee are achieved within a timeline (Chapter 2). The BCC Guidelines Subcommittee lacked a facilitator or chairperson that kept all participants focused on the terms of reference and guided them through the dispute resolution process.

The proposed guidelines (Appendix 3) have not been endorsed by the BCC and a new facilitated guidelines review process was initiated in March 2001.

**7. The principles of interest-based negotiations should be followed by the BCC and its Guidelines Subcommittee to achieve consensus-based decisions.**

The power-based approach to dispute resolution (Chapter 2) did not function well in the Guidelines Subcommittee. Individuals were focusing on positions rather than specific

interests. Bargaining for industrial operating deadlines in caribou range created a win-lose scenario rather than a consensus-based decision. Using the interest-based approach (Chapter 2), participants would find common ground by discovering underlying interests, and then work to craft solutions to meet their most important interests.

### **5.2.2 Recommendations for Improvement to the Proposed Consolidated Industrial Operating Guidelines for Caribou Range**

The following summarise the most important recommendations to the proposed consolidated guidelines. For more extensive recommendations made by questionnaire and interview respondents refer to Appendix 2.

- 1. An external organization should have been involved in evaluating the proposed consolidated guidelines. This may have enhanced the validity and decreased any internal biases that BCC members may have formed during the BCC meetings and the guidelines evaluation process.**

External consultants provide objectivity, a “fresh set of eyes”, and may be able to recommend new ideas, while in-house staff have specific technical knowledge of the issues and have better access to information. An auditing team comprised of external consultants and BCC members may have had a better chance of providing an objective review and creative solutions than was achieved through the self-evaluation carried out by the BCC.

- 2. The proposed consolidated guidelines must address the recovery of existing disturbances in caribou range.**

An inventory of existing disturbances (e.g., roads, pipelines, seismic lines, cutblocks and peat harvesting areas) within caribou range needs to be created to identify those disturbances that are not being used on a regular basis. The guidelines could then encourage access management and reclamation efforts on these areas. For many of these disturbances, the company that initially created them is not known. Therefore the



guidelines should encourage a cost-share program between the government and those companies that are currently operating in woodland caribou habitat.

The BCC has already taken steps to address this recommendation. The Boreal Caribou Research Program (BCRP) has submitted an application to the federal Habitat Stewardship Program to start a project aimed at speeding the recovery of existing seismic lines and pipelines. The project will demonstrate and evaluate means of speeding the recovery of the existing industrial footprint on the landscape.

**3. Any companies creating new industrial disturbances within caribou range should submit their plans in a digital format to the provincial regulators.**

A digital profile of disturbances on caribou range would make it easier to analyze the total amount of industrial disturbance and to potentially forecast the cumulative effects of this disturbance.

**4. There are some Alberta government policy barriers that should be revised because they currently prevent the guidelines from satisfactorily addressing the recovery of existing development, management of new development and management of the total amount of activity on caribou range.**

**Alberta Land and Forest Service Policy on Closure of Existing Access** - An access management plan should be developed for areas in caribou range in association with all user groups. An inventory of existing access corridors that are used by hunters, trappers and recreationalists is required. Upon collaborative public involvement, Alberta Land and Forest Service can then determine which corridors can be blocked and reforested and which ones need to be kept open.

**Pipeline Act** – Right-of-way (ROW) widths need to be kept to a minimum through caribou range where it may a long period of time to return to a functioning peatland. The fewer disturbances that are made on the landscape, the easier it will be to speed up the recovery of existing disturbances.

**Posting of Land Sales** - There needs to be a limit on the number of parcels of land that are sold in caribou range. This will in turn help limit the amount of activity on caribou range. One possibility exists in the provision of some kind of incentive to industry so that they won't develop in important caribou habitat (e.g., areas used for calving and optimal forage). Another possibility would be to provide a rebate to companies that stagger their operations so that they all do not occur on the final year of the lease. Thus far the incentives have been designed to encourage drilling and activity. The government has to take the initiative to restructure the incentives so that industrial activity can occur while the amount of activity is limited in caribou ranges. More sharing of geophysical information between companies would also help limit the amount of activity occurring on caribou range. For example, instead of having ten different seismic companies go into an area you could have one company do the work and sell the data to whoever wants it. A database, accessible to all companies operating in caribou range, that contains information regarding roads, utility corridors, seismic line locations, etc. would encourage more sharing of access and corridors.

**5. The consolidated guidelines must reflect the need to manage the cumulative amount of activity on caribou range.**

Timing constraints have not been effective at managing the amount, spatial extent and distribution of all industrial activity within caribou range. Most recommendations for improvement from the representatives included the need for the guidelines to address the management of the cumulative amount of industrial development in caribou range (Appendix 2).

To address the need for a model or decision support tool to help us understand the accumulating effect of natural disturbances and human development, on caribou population and habitat supply and effectiveness, the BCC is currently focused on modeling at two scales: landscape (Alberta Landscape Cumulative Effects Simulator) and population (Woodland Caribou Cumulative Effects Model).

**6. The public interest in caribou conservation programs needs to be defined.**

I propose that a survey be performed to identify the value that Alberta residents place on a woodland caribou conservation program that aims to manage industrial activity within caribou range. This approach would help to more clearly define the public interest in caribou conservation, place some actual monetary values on the benefits of such a program and would facilitate integration of a broader spectrum of interests in making decisions regarding the management of industrial activity on caribou range.

### **5.3 CONCLUSION**

In this MDP, I determined the participatory nature of the BCC and its Guidelines Subcommittee according to a framework for evaluating the public participatory process. I identified characteristics of the committees that are both supportive and barriers to the public collaborative process. The recommendations provided will lead to increased quality of caribou management decisions and greater support by all citizens for those decisions.

Secondly, I facilitated an evaluation, within the BCC, of the consolidated industrial operating guidelines for caribou conservation in the Boreal Forest Natural Subregion. The evaluation considered the potential of the proposed consolidated guidelines to reduce the cumulative effects of existing and new development in caribou range in comparison with existing regional guidelines. This evaluation identified areas where the guidelines needed to be improved and provided recommendations for this improvement. Possible future alternatives for management of industrial activities in caribou range were also considered.

The recommendations for Alberta government policy changes will allow the guidelines to more fully address such issues as speeding up the recovery of existing linear corridors and managing the amount of activity within a caribou range. The guidelines will require

support from the public and senior levels of government and industry for successful implementation. A stronger commitment to involve the full range of stakeholders in the decision-making process will result in a wider range of alternatives and increase the innovativeness of decisions. New ideas, such as encouraging a cost-share program between the government and those companies that are currently operating in woodland caribou habitat to re-vegetate existing disturbances that are not being used, are key to the success of the guidelines' ability to address the issues of recovery of existing linear corridors and managing the amount of activity within a caribou range. Further research with the landscape and population modeling tools is necessary to identify acceptable thresholds of development to caribou. Until these thresholds can be calculated the precautionary principle must be adhered to when developing industrial operating guidelines or making management decisions regarding caribou.