Revelstoke and Area

Land Use Planning

Final Recommendations

October, 1999

EXECUTIVE SUMMARY

Background

In November 1994, the Commission on Resources and Environment (CORE) issued the West Kootenay report, which included the Revelstoke area, with recommended management practices for biodiversity, caribou and other values. The report predicted as much as a 40% reduction in timber supply for the Revelstoke area. Many Revelstoke citizens were outraged and demanded the opportunity to develop their own recommendations, which the government agreed to consider.

A Community Negotiating Committee was appointed to develop an alternative approach. The provincial government's announcement of its decision regarding the Kootenay-Boundary Land Use Plan in late March 1995, stated 'government accepts the work of the people of Revelstoke' and 'the community will be invited to continue its work to provide the Ministry of Forests with advice on land-use issues'.

The community accepted the invitation to continue to be involved in land-use planning. Terms of reference were developed for the Revelstoke and Area Land Use Planning Minister's Advisory Committee (MAC) whose main task has been:

> 'To begin to implement the West Kootenay Land Use Plan for Revelstoke and Area by developing strategies which address the values identified. This …will build upon the work of the Negotiating Committee by taking the values and objectives, as identified by the Negotiating Committee, one step further.'

Consistent with the terms of reference, seven citizens were selected to serve on the Advisory Committee by Revelstoke City Council and Regional Directors for Areas B and E. The recommended Committee membership was accepted by the Minister of Forests in September 1995 and the Committee began meeting in October 1995.

Given the technical nature and the extent of the work required, the Committee was assigned government resource management specialists to form a Technical Team, and economic development and transition specialists to form an Economic Team. These teams worked under the Committee's direction to provide technical information and advice.

The Committee has met over the past four years to hear information from a wide range of individuals and interests, to provide direction to the Technical and Economic Teams and to make decisions about the content and the process of their work. Throughout the process, the Committee has attempted, where appropriate, to coordinate its work with the ongoing development of the Implementation Strategy for the regional Kootenay-Boundary Land Use Plan.

The Challenges

The Advisory Committee's task, working from the direction provided by the Negotiating Committee, was to develop recommendations regarding the implementation of the land use plan that, as much as possible, balance the economic, environmental and social needs of the community and the province. This is not a simple task in the circumstances in the area, leading to the prediction by the Chairperson early in the process that 'likely no one will be happy with what we recommend'.

The landbase in the area creates natural challenges, and also opportunities. The spectacular, steep mountain peaks are magnets for outdoor adventurers, but the resulting terrain concentrates rich biological resources in the valley bottoms and limits the area that is accessible for timber harvesting. As well, the valley bottoms have been flooded by the construction of the Mica, Revelstoke and High Arrow dams, reducing the area of prime timberland, wildlife habitat and biological richness.

The mountain caribou herd that ranges through the National Parks and the forests north of the city creates very special challenges for management of this area. This herd is the southernmost genetically viable, healthy herd in the province. This has led to provincial, national and international interest in its maintenance. Research information about the habits of the herd confirms it requires extensive areas of old forests due to its wide seasonal range and the small amount of suitable forage in each area. These caribou spend much of the year high in the mountains. To escape the deep, soft snowfalls early in the winter, they migrate through forested areas to lower elevation habitat, generally avoiding young forests and steep slopes. These behaviours create a direct conflict with the timber industry which relies on lower elevation, less steep areas for its operations.

Deer, moose and elk also inhabit the lower elevation forests, creating further challenges to find practices that are compatible with the timber industry.

In addition, the government has developed policy and practices for maintaining biodiversity across the landscape which requires defined amounts of forests of specified ages to be present at all times. The requirements for maintenance of older forests are highest in areas like Revelstoke where there have naturally been large areas of old forests. This policy creates substantial implications for the timber industry.

In recent years outdoor adventure tourism and highway-related travel has increased substantially as Revelstoke has been identified internationally as one of the best locations for winter adventure sports and other activities. This has increased the importance of highway viewscapes, and created the potential for conflicts with environmental values.

Management practices for these resource values had to be developed within the context of uncertainty about the available timber supply. For almost 20 years the timber supply forecasts provided by government have indicated a falldown in timber supply would occur, though the timing has varied. The reviews conducted by the Chief Forester in 1994-95 indicated a drastic decline in forecasted timber supply for the next several decades, beginning with an immediate 12% reduction. This was the case even though management practices for caribou and the new biodiversity requirements were not completely implemented. The 1999 review on part of the area indicated timber supply was stable for as much as 40 years, though substantial reductions were forecast in the future.

The timber industry and tourism are corner posts of the local economy, and their future depends largely on the management of the natural resources in the area. Balancing the maintenance of environmental values with the economic and social values of these industries has been the primary challenge of this process, requiring unusual techniques which fit the local landscape and community.

Resource Management Recommendations and Impacts

The Advisory Committee developed these recommendations by listening to public views and the advice of the Technical Team, considering the impacts of alternative strategies and seeking solutions that minimized the negative impacts as much as possible. As this plan will be implemented within the context of government's March 1995 land use decision, the direction of the Kootenay-Boundary Land Use Plan and its Implementation Strategy has been followed as much as possible. However, in many cases the unique conditions in the Revelstoke area prompted the Committee to challenge the Technical Team to develop innovative, creative approaches that reflected a sound understanding of the local environmental and economic values.

Detailed examination of alternatives occurred in early 1996 based on the information that was available at that time. In June 1996 questions were raised about the accuracy of the timber supply forecasts which prompted reanalysis, requiring a year delay. Draft recommendations and impact information was publicly reviewed in October 1997. During the review the local timber operators provided information indicating the revised timber supply forecasts could be substantially overestimating available supply. Further analysis was required to reconcile these differences, leading to the development of minor refinements to the original recommendations which were publicly reviewed in May 1999.

The recommended management objectives and practices are summarized in the attached table, with a brief description of the expected impacts. More details on the practices are contained in Chapter B of these recommendations, which includes general direction, management guidelines and landscape unit specific information. Chapter C contains a detailed impact assessment.

The Advisory Committee has agreed on final recommendations which attempt, as much as possible, to achieve a fair balance of risks among all resources and resource users. The Committee is very concerned that these recommendations put several environmental values at moderate to high risk of unacceptable change, and create substantial risk to the timber sector through the uncertain feasibility of some of the recommended practices. The Committee has searched for other alternatives that reduce the risks to all values, but no better alternative could be identified.

Implementation Recommendations

As the biodiversity and caribou management objectives differ from provincial policy, the Advisory Committee recommends that these components be legally assigned higher level plan status under the Forest Practices Code. This is a key recommendation because, without higher level plan status, the biodiversity strategy, which is central to these recommendations, cannot legally be implemented under the Forest Practices Code. It is also recommended that landscape unit planning proceed as quickly as possible based on the objectives and strategies included in these recommendations, unless there is further public input or new information.

The community is eager to continue to participate in land use planning, particularly given the resource issues and the state of the available information for the area. Consistent with the provincial strategic plan monitoring framework, the Committee recommends the provincial government be prepared to support the community in future planning processes as needed to address new land use issues. In particular, special advice from the community may be needed in the upcoming timber supply reviews for the community and Evans tree farm licenses. In addition,

the Kootenay-Boundary Land Use Plan Implementation Strategy (June 1997) provides for two annual meetings in the region to review an annual report outlining the status of the land use plan. The Committee supports this approach and recommends that an annual public meeting be held in Revelstoke in addition to the two regional locations. The Committee also recommends that the community establish a Land-Use Plan Monitoring Committee to provide further recommendations on the implementation or adjustment of this strategy. Provincial government resources will be required to support this group.

Economic initiatives and resource management projects supporting implementation of these recommendations are also included.

Description and Impacts of the Revelstoke and Area Land Use Planning Recommendations

Value	Recommended Objectives, Strategies and Practices	Impact Assessment
Environmental Resources		
Biodiversity	High and intermediate biodiversity emphasis is assigned along north-south and some east-west connectivity corridors, and some special habitats, consistent with the location of important biodiversity values. Several other biological values (caribou habitat, ungulate winter range, some fisheries) are located in the same areas, thus minimizing the potential collective impacts on timber supply, and dispersing the impact on individual timber operators to some degree. It is understood locally that this approach is consistent with the Forest Practices Code Biodiversity Guidebook. The following refinements to provincial biodiversity policies are also recommended: • Reducing the recommended area under high and intermediate biodiversity emphasis (provincial target assignment: 10% high, 35-60% intermediate and 30-55% low) to 9.5% high, 22% intermediate and 69% low emphasis, with approximately 23% of the low emphasis area assigned caribou management practices which are similar to intermediate biodiversity management. These percentages are based on a 1994 database of the operable area. • Requiring the biodiversity requirements to be met on the operable forest within the designated corridors rather than from the total forested landscape. • To minimize the risk to the very high concentration of biological values in Evans Forest Products Tree Farm License 55 and the Revelstoke Community Forest Corporation Tree Farm Licence 56, while minimizing reductions to timber supply, patch size distribution replaces the green-up requirement.	Moderate to high risk to ecosystem representation over the majority of the area, with higher risks to ecosystems that are uncommon in the area, but common elsewhere. Moderate to high risk to regional connectivity

Value	Recommended Objectives, Strategies and Practices	Impact Assessment
Biodiversity (continued)	On the Revelstoke Timber Supply Area and Pope and Talbot Tree Farm Licence 23 green-up height was reduced from 3 metres to 2 metres and a range of patch sizes has been encouraged. The mature plus old forest requirements have been retained, although provincial policy allows them to be waived.	
Mountain caribou habitat	Maintain the current population in the northern portion of the area by applying management practices for caribou to habitat defined by the locally developed map. Caribou management practices require a relatively large area of old forests to be maintained (40% of the habitat must have forests at least 140 years old). Secondary habitat in Standard Basin and habitat in the south Frisby Ridge area where snowmobiling is prevalent are assigned intermediate biodiversity practices. Aggregated harvesting blocks will create large continuous areas suitable for caribou which reduces habitat risk slightly.	Moderate habitat risk to the Revelstoke herd; very high habitat risk to the Monashee herd, though not due primarily to the MAC strategy.
Grizzly bear habitat	Management of bear attractants including garbage, fruit trees, etc. in the city, settled areas, the landfill site and tourism and recreation facilities is recommended. Access management and some timber harvesting practices are recommended to minimize disturbance. For example, mature timber is required to be maintained along one side of avalanche chutes, rather than on both sides of chutes as required regionally. Aggregated harvesting blocks will concentrate operational activities, facilitating better access management.	Low to moderate risk with access controls; moderate to high risk without access controls

Value	Recommended Objectives, Strategies and Practices	Impact Assessment
Ungulate (deer, moose, elk) winter range	Management practices are recommended for mapped critical ungulate winter range to maintain adequate critical winter range to support viable populations. Substantially more area is included than in the regional plan, and it largely overlaps with the biodiversity corridors and caribou habitat. Mature forest cover (at least 120 years old) must be maintained on 40% of the winter range – less than the 50% required in the regional strategy. Cover requirements for critical moose habitat within TFL 55 and 56 are reduced to 34% cover at least 100 years old, provided desired moose winter range attributes are met.	Low habitat risk for deer and elk. Moderate risk for moose populations in the Downie, Goldstream and Bigmouth areas. Low risk for moose in other areas.
Regionally significant fisheries	Assessments are recommended for key fisheries streams in order to define acceptable levels of disturbance. Management within the defined acceptable level of disturbance.is recommended.	Moderate to high risk south of Revelstoke; moderate risk north of Revelstoke
Resource Sectors		
Forestry	462,000 cubic metres projected over next 10 years due to 6-8% reductions for Evans and Revelstoke Community Forest Corporation Tree Farm Licenses (TFL s 55 and 56). Forecasts for the Revelstoke Timber Supply Area, Evans Tree Farm License and the Pope and Talbot Tree Farm License are uncertain due to lack of detailed spatial analysis.	Uncertainty about the accuracy of the forecasts creates a substantial risk to the industry. 10 person-years of employment at risk in first 10 years based on reduced timber supply. Projected $160,000 reduction in stumpage revenues based on average stumpage of $10.50 per cubic metre. Projected $80,000 reduction in harvest-related provincial tax revenues.

Value	Recommended Objectives, Strategies and Practices	Impact Assessment
Forestry (continued)	Extensive operable area added, mainly on steep slopes with lower value timber. Patch size distribution practice will create some large, aggregated openings.	This additional area substantially offsets the actual timber supply impacts of the resource guidelines. The additional operable area is likely to increase average harvesting costs. The Community Forest Corporation and Evans operations are relatively small creating the possibility that seemingly minor changes in timber supply and costs might substantially reduce the profitability and viability of each operation. The aggregated openings reduce planning, roading and harvesting costs.
Tourism	Class 1 viewscape assignment to Trans Canada corridor and Revelstoke viewscapes. To reflect tourism values along Highway 23S, increased emphasis has been placed on visual landscape design and rehabilitation within Class 3 viewscape assignment. Regional strategy assigns Class 2 management for Highway 23S. Aggregated harvesting openings will result in larger cutblocks in some areas. Provisions for commercial tenure holders to formally articulate their needs when forest management and mining planning approvals are being considered.	Viewscapes should be improved through rehabilitation of existing industrial openings, and landscape design of future openings. Reduced green-up requirements and aggregated harvesting openings may make logging more evident in the backcountry. This should be partially mitigated by provisions for improved design to better integrate openings into the landscape. Plan clarifies and formalizes management of tourism related resources.

Value	Recommended Objectives, Strategies and Practices	Impact Assessment
Mining	11 of 14 high and moderate mineral value areas have a high level of overlap with one or more resource values which could result in management that is restrictive to mining	Overall impact is expected to be relatively small. Access will not be restricted. Potential for restrictive management in overlap areas may increase costs and timing of approvals which could result in a decrease in investor confidence and limit more marginal operations.
Community		
Population stability	Economic initiatives identified to offset projected employment at risk.	Total of 15-20 person-years of employment in Revelstoke estimated to be at risk over next 10 years (0.5% of total employment). The diversified economy buffers the employment impacts at the community level.
Heritage – management of sites/areas	Heritage values are identified in landscape units, with general management guidelines.	Resource management should provide protection of heritage sites and trails

Chapter A Background

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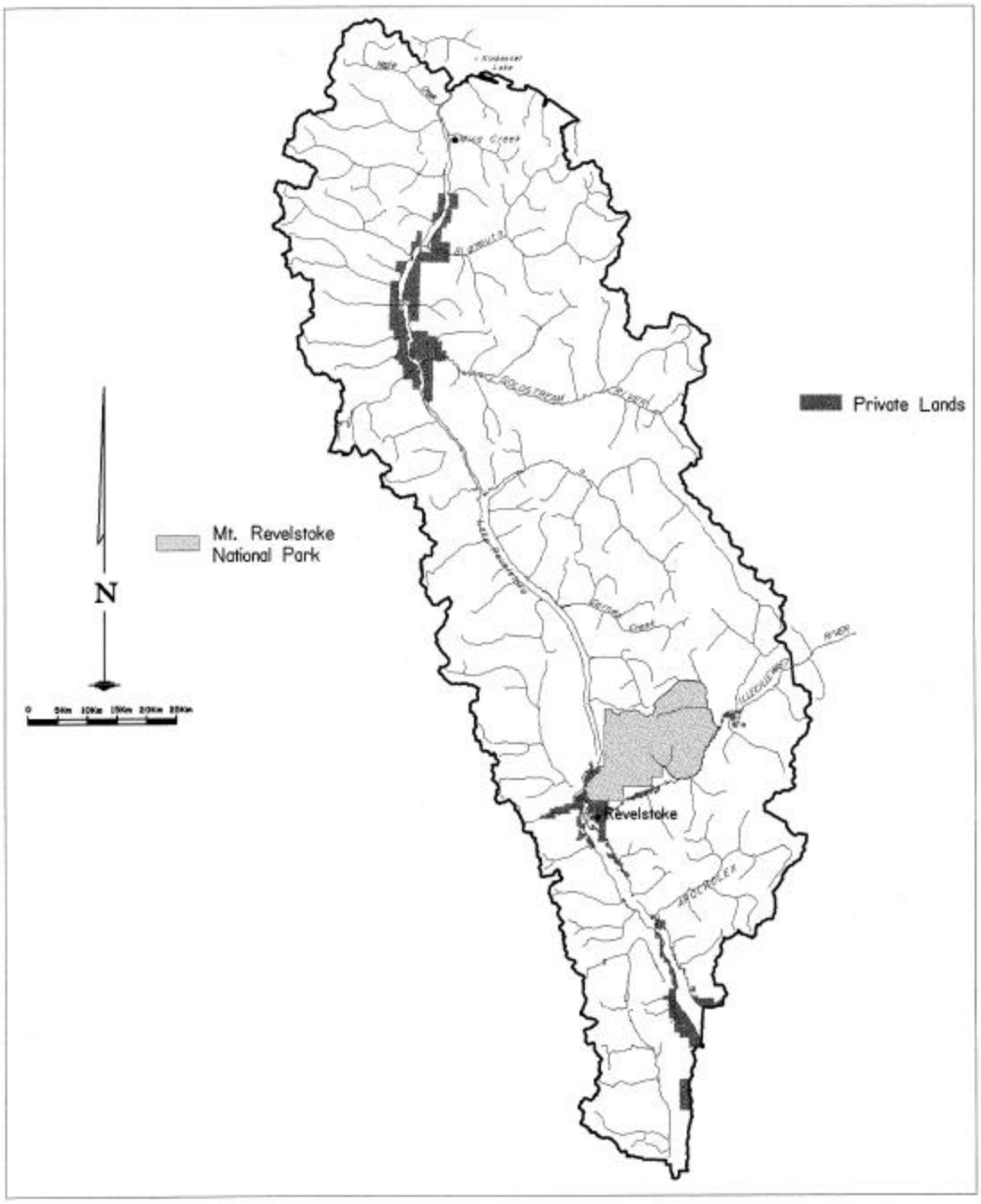
Appendix A-1 Revelstoke and Area Land Use Planning Minister's Advisory Committee Terms of Reference

A. 1.0 The Revelstoke Area

The Revelstoke area includes the west slopes of the Selkirk Mountains, the Columbia River valley, and the east slopes of the Monahsee mountains from Shelter Bay on the Arrow Lakes north to the Mica Dam on Kinbasket Lake (Map A1).



Map A1. The Revelstoke planning area

A. 2.0 The Land Use Planning Process

A. 2.1 Land Use Planning in the Revelstoke Area to 1995

The Commission on Resources and Environment (CORE) was created in 1992 to address land use planning issues across the province. The Revelstoke area was part of the Kootenay-Boundary Land Use Planning (KBLUP) CORE process. Several Revelstoke citizens participated in the KBLUP process representing communities, tourism, heritage and environment sectors.

In November 1994, CORE issued the West Kootenay report, which included Revelstoke, and recommended management practices for biodiversity, caribou and other values. The report predicted as much as a 40% reduction in timber supply from these management practices. Many Revelstoke citizens were outraged with these recommendations. The community reacted by demanding the opportunity to develop its own recommendations, which the government agreed to consider.

Eight citizens were appointed to the Community Negotiating Committee. They presented their report '*Revelstoke and Area Response to the CORE Report'* and a map identifying resource values to the provincial government in early March 1995. In this report the Negotiating Committee outlined the following long-term land use objectives after extensive discussion, several community meetings and meetings with countless local organizations:

1. Land use decisions must be compatible with the Revelstoke Vision Statement.

2. The sustainability of our land resources must be maintained for all interests. Every attempt must be made to address high value interests in each particular area.

3. An economically viable and sustainable forest industry must be maintained.

4. Tourism and mining are to be further developed as significant economic contributors to our region.

5. Land use decisions should be designed to maintain as stable a job base as possible.

6. Biodiversity is to be maintained with critical ecosystem characteristics and wildlife habitat.

7. Land, water and air access for all interests is to be maintained with appropriate measures to ensure protection of environmental values.

8. Visual impacts of land use are to be minimized by technical planning along major travel corridors, recreational and high tourism areas.

9. Opportunities for individuals to be meaningfully involved in planning for land and resource use processes are to be provided.

10. We need to continually seek and analyze new information that helps us ensure good decision-making based on the evolving economic, social and environmental values of society.

A map was also prepared by the Negotiating Committee which delineated areas of land called polygons and, for each polygon, identified the resource values that require 'enhanced management' in a table of resource values included on the map.

In the announcement of its decision regarding the KBLUP in late March 1995, the government stated it 'accepts the work of the people of Revelstoke' and 'the community will be invited to continue its work to provide Ministry of Forests with advice on land-use issues'.

A. 2.2 Minister's Advisory Committee

The community accepted the invitation to continue to be involved in land-use planning for the area. Terms of reference were developed for the Revelstoke and Area Land Use Planning Minister's Advisory Committee (MAC) whose main task is:

> 'To begin to implement the West Kootenay Land Use Plan for Revelstoke and Area by developing strategies which address the values identified in the West Kootenay Land Use Plan. This will be done on a polygon by polygon basis and will build upon the work of the Negotiating Committee by taking the values and objectives, as identified by the Negotiating Committee, one step further.'

In January 1996, the Advisory Committee was asked to expand its role by making economic recommendations. Its terms of reference was revised to add:

> 'If the resource management strategies indicate economic and social implications are likely, the Committee is also requested to recommend opportunities to maintain employment relative to impacts anticipated from the recommended resource management strategies, and to identify realistic and affordable economic strategies to maintain community stability.'

(See Appendix A-1 for the full terms of reference)

The terms of reference for the Advisory Committee defined that the membership would be selected by Revelstoke City Council and Regional Directors for Areas B and E. Committee composition was also defined to include representation from community members who:

a) Have a respected history of community service
b) Understand land use planning
c) Can collectively provide a well-balanced perspective to land use in the Revelstoke sub-region
d) Can communicate effectively with the public

The Minister of Forests accepted the recommended committee membership in September 1995 and the Advisory Committee began meeting in October 1995. At that time the term of the Committee was expected to be six months.

Given the technical nature and the extent of the work required, the Advisory Committee was assigned government resource management specialists to form a Technical Team, and economic

development and transition specialists to form an Economic Team. These teams worked under the Advisory Committee's direction to provide technical information and advice which has formed the basis of these recommendations.

The Land Use Coordination Office of the provincial government hired a local consultant to coordinate the committee's work.

A. 2.3 Overview of the Timeline

The Advisory Committee has met approximately 55 times to hear information from a wide range of individuals and interests, as well as to provide direction to the Technical and Economic Teams and to make decisions about the content and the process of their work. All of the meetings have been open to the public.

The following outlines the steps taken by the Advisory Committee in its work:

Date	Action
Oct. 1995 – Jan. 1996	While awaited KBLUP Regional Team work, presentations and a field trip informed MAC of resource management issues.
Jan. 1996	Presentation from KBLUP Regional Team indicating regional strategies do not reduce the predicted timber supply impacts in Revelstoke. MAC was encouraged to begin thoroughly examining local, innovative options.
Feb. – March 1996	Technical Team undertook a timber supply analysis to examine the implications of implementing enhanced management for the values identified by the Negotiating Committee. As the timber supply implications of this approach were unacceptably high, the MAC directed the Technical Team to examine a range of options to reduce this impact.
April 1996	MAC agreed on a preliminary MAC strategy and directed that a multiple accounts impact assessment be prepared to examine the implications of the preliminary strategy on the full range of values.
June 1996	The timber supply analysts indicated there was a problem with the timber supply analysis work which provided the foundation for much of the impact assessment.
September 1997	The timber supply reanalysis was completed and with some minor refinements, the preliminary MAC strategy (April, 1996) was adopted as draft recommendations for public review with a revised multiple accounts impact assessment.
October 1997	Citizens provide input in two community workshops and a public meeting, as well as through ?? written submissions. Timber supply analyses prepared by the local forest industry suggest the impacts may be twice what has been predicted. MAC directs the Technical Team to reconcile the differences before proceeding.

Date	Action
December 1997	The differences were reconciled, and it was agreed that more detailed analysis was required to improve the accuracy of the timber supply forecasts. A case study of the the Community Tree Farm was initiated using spatial analysis.
April 1998	Spatial analysis was completed and awaited government review.
September 1998	Government review pointed out key issues with the spatial analysis.
November 1998	Key issues are resolved and MAC decides on revised recommendations for the Community Tree Farm.
December 1998	MAC directed the Technical Team to apply the new information to the remaining management units. The Chief Forester released the timber supply analysis for the Timber Supply Area.
March, 1999	MAC decides on revised recommendations for all the management units.
May, 1999	Revised recommendations publicly reviewed
October, 1999	Final recommendations submitted to the Minister of Forests

Throughout the process, the Advisory Committee has directed the Technical Team to coordinate its work with the ongoing development of the Implementation Strategy for the regional Kootenay-Boundary Land Use Plan, where appropriate.

A. 3.0 Overview of Economic, Environmental and Social Values

A. 3.1 Historical Perspective

Throughout its history, the Revelstoke area has been involved in balancing economic, social and environmental values because the economy of the community is closely tied to resource development, which, in most cases, changes the natural landscape. The national railway initially provided a reason for the townsite in the 1890s, and railroad income has been a long-standing and substantial component of community income. The City grew rapidly and became a major supply centre for the mining boom in the northern reaches of the area in the early 1900s. The addition of the highway through Rogers Pass, and the recent twinning of the railway has brought more economic activity to the community. However, the highway and the railway have also created barriers to the north-south migration of forest species. Although the construction of the Mica and then the Revelstoke dams beginning in 1962 created a surge of economic activity for the community, large areas of prime timberland and wildlife habitat was flooded, removing economic and environmental opportunities for Revelstoke.

Tourism was initiated when the new railroad first brought international mountain climbers and adventurers to the area. The industry expanded substantially when the highway was constructed,

permitting travellers to cross Canada and visit the string of Rocky Mountain national parks. Highway-related and outdoor adventure tourism continues to be a strong component of the community economy.

Throughout this history the timber harvesting and processing industry has been active, first supplying ties and timber to the railway and the mines, and now primarily shipping construction timber outside the community. The economic importance of the timber industry in the community has changed over time as other industries have expanded and contracted, and as timber companies have restructured. It is currently a more substantial contributor to the local economy than in the recent past. Timber harvesting practices have evolved from large, continuous cutblocks, to smaller and smaller cutblocks with the assumption that these smaller cutblocks would reduce negative impacts on environmental values. Harvesting methods have also changed from ground-based skidding to cable yarding which has required substantial innovation and adjustment by local logging crews.

A. 3.2 Current Situation

Over the past 15 years, more information about the mountain caribou herd that ranges through the National Parks and the forests north of the city has become available, indicating the approximately 400 animals in the herd are generally healthy and this is the most genetically viable herd in the southern portion the province. This has led to provincial, national and international interest in the maintenance of this herd.

Research information about the habits of the mountain caribou herd confirms it requires extensive areas of mature forests due to its wide seasonal range and the small amount of suitable forage in each area. These caribou spend much of the year high in the mountains feeding on lichens growing on trees, shrubs and other vegetation. To escape the deep, soft snowfalls early in the winter, the caribou migrate to lower elevation forests where there is less snow and they can feed on evergreen shrubs and lichen growing on very old trees. Caribou generally avoid steep slopes. These behaviours create a direct conflict with the timber industry which relies on lower elevation, less steep areas for its operations.

In recent years, the development of the outdoor tourism sector and increased travel on provincial highways has created concern about viewscapes, as well as increased use of logging roads for tourism and recreational purposes. Maintaining viewscapes can conflict with timber harvesting, while increased use of logging roads can create problems for wildlife, particularly grizzly bears. Recently, the government has accelerated the approval of Commercial Recreation tenures for backcountry tourism businesses, creating additional expectations from the landbase.

At the same time, on a provincial scale, the government has developed policy and practices for maintaining biodiversity across the landscape. This requires that defined amounts of forests of specified ages be present at all times. The requirements for maintenance of older forests are highest in areas like Revelstoke where there has naturally been large areas of old forests. This policy creates substantial implications for the timber industry.

Management for this broad range of important values on a finite landscape must also occur in conjunction with a planned decline in timber harvesting. In 1945, as part of the Sloan Commission examining forest management in the province, there was much discussion about the appropriate rate of harvest. The commissioner realized that, because new, regenerated forests would be harvested at a much younger age than the very old timber that the industry was currently harvesting, there might be less timber in the future than in the present very old forests, even with intensive forest practices. It was decided that the province would embark on a timber harvesting pattern with a higher level of harvest in the short-term than would likely be possible when the second growth forests were harvestable. There was an expectation of a 'falldown' in timber supply to reconcile the difference in the amount of timber from old and new forests, and this falldown was greatest where there was abundant old-growth forests, as in Revelstoke.

For almost 20 years the timber supply forecasts provided by government have indicated this falldown would occur, but the forecasts prepared in 1981 suggested this would not happen locally for almost 100 years. The Timber Supply Reviews conducted by the Chief Forester in 1994-95 indicated a drastic decline in forecasted timber supply for the next several decades, and the need to reduce the allowable annual cuts in the Revelstoke area by an average of 12% immediately. This was the case even though management practices for caribou and the new biodiversity requirements were not completely considered. The 1999 Timber Supply Review for the Timber Supply Area indicated timber supply was stable for as much as 40 years, though substantial reductions were forecast in the future.

Timber processing and tourism are major employers and income generators in the community, with the mining sector being active as markets permit. These sectors rely on the natural resources in the area for their future, making it necessary for the Advisory Committee to thoroughly consider the implications of any recommendations that affect these sectors, and thus the community.

The Advisory Committee's task, working from the direction provided by the Negotiating Committee and supported by the provincial government, has been to develop recommendations regarding the implementation of the land use plan that, as much as possible, balance the economic, environmental and social needs of the community and the province. This is not a simple task in these circumstances, leading to the prediction by the Committee Chairperson early in the process that 'likely no one will be happy with what we recommend'.

Appendix A-1

REVELSTOKE AND AREA LAND USE PLANNING MINISTER'S ADVISORY COMMITTEE

Terms of Reference - Revised February 20, 1996

Revisions are in ***bold italics***.

Background

As part of the West Kootenay - Boundary Land Use Plan, the Provincial Government has issued Revelstoke a special, unique invitation to form a Minister's Advisory Committee to provide an interim report to the Minister of Forests by December 31, 1995 and a final report by March 31, 1996. Their immediate priority will be to provide advice on application of Forest Practices Code guidelines, caribou habitat needs, alternative harvesting and silviculture techniques and location of areas for enhanced forestry by undertaking the next level of planning which starts to implement the West Kootenay Land Use Plan for the Revelstoke area. This is viewed by city and regional politicians as a step before the establishment of a Community Resource Board, which cannot take place until government has established a mechanism for this process.

In order to accomplish this task, the Revelstoke City Council and Regional Directors for Areas B and E of the Columbia Shuswap Regional District has formed a Minister's Advisory Committee and a Technical Team is being formed under the local Ministry of Forests. The intent of this document is to expand on this idea by defining a terms of reference and process for implementation.

1.0 Mandate of Minister's Advisory Committee (M.A.C.)

1.1 The basic mandate for the Minister's Advisory Committee will be:

To begin to implement the West Kootenay Land Use Plan for Revelstoke and Area by developing strategies which address the values identified in the West Kootenay Land Use Plan. This will be done on a polygon by polygon basis and will build upon the work of the Negotiating Committee by taking the values and objectives, as identified by the Negotiating Committee, one step further.

If the resource management strategies indicate economic and social implications are likely, the Committee is also requested to recommend

opportunities to maintain employment relative to impacts anticipated from the recommended resource management strategies, and to identify realistic and affordable economic strategies to maintain community stability.

1.2 This mandate will be accomplished by

a) Conducting public communication and seeking public input regarding land use discussions.

b) Liaising between the public and the Technical ***and Economic*** Team***s*** and providing guidance or direction to the Technical ***and Economic*** Team***s*** to ensure that recognition and consideration of all values is taken into account during the work of the Technical ***and Economic*** Team***s***.

2.0 Decision Making

2.1 The Minister's Advisory Committee should follow the same decision making process as utilized by the Negotiating Committee which was:

- Items must have 70% support and people with dissenting viewpoints will have the opportunity to state their dissent and the reasons for it.

- If 70% support could not be achieved, the matter will be referred to the "Review Group" discussed in Section 7 below, if 70% agree to such a referral. The Reveiw Group may provide advice or comments to the Committee, or may reserve comment until a report is submitted.

3.0 Selection and composition of the Minister's Advisory Committee

3.1 The Minister's Advisory Committee should be selected by City Council and Regional Directors for Areas B and E (Loni Parker and Rhona Martin). Committee composition should reflect representation from community members who:

a) Have a respected history of community service
b) Understand land use planning
c) Can collectively provide a well-balanced perspective to land use in the Revelstoke sub-region
d) Can communicate effectively with the public

The Committee composition shall then be presented to the Minister of Forests, with appropriate justification, for final decision by the Minister.

3.2 Should a member of the Committee resign, City Council and the Regional Director will examine the practicality of selecting a replacement. Replacement

members will be selected and confirmed consistent with the process outlined in Section 3.1.

4.0 Committee Chair and Staff Support

4.1 The Committee Chair will be selected by City Council and the Regional Directors.

4.2 The Land Use Co-ordination Office will supply a facilitator with expertise in land use planning to work with both the Minister's Advisory Committee and the Technical Team*s*.

5.0 Mandate, Terms of Reference for the Technical Teams

5.1 Technical Team

1. The basic mandate for the Technical Team would be to:

   a) Develop technical operational level guidelines, tied to the Forest Practices Code, for each of the individual resources, and

   b) Prepare resource targets for each polygon and strategies for each resource value.

2. Attendance at technical meetings will change according to the topic under discussion however the Technical Team should have primarily local composition

3. The primary responsibility for the functioning of the Technical Team should rest with the Provincial regulatory Ministries of Forests; Environment, Lands and Parks; Mines; and Tourism.

4. This group requires technical expertise along all the land use issues. This will require participation from government agencies who will involve tenure holders and non-government agencies as appropriate.

5. The Ministry of Forests will designate the Chair for the Technical Team.

5.2 Economic Team

1. The basic mandate for the Economic Team would be to:

a) Estimate the direct and spin-off job and income impacts, and the community and social implications of alternative resource management objectives, strategies and targets

b) Identify opportunities to maintain employment relative to impacts anticipated from the recommended resource management strategies

c) Recommend realistic and affordable economic strategies to maintain community stability

2. Attendance at economic meetings will change according to the topic under discussion however the Economic Team should include local representatives as well as external expertise in economic analysis and community transition provided by the provincial government.

3. The primary responsibility for the functioning of the Team should rest with the office of the Job Protection Commissioner.

4. This group requires technical expertise across a range of economic and social issues. This will require participation from municipal and provincial government agencies and involvment of non-government expertise as appropriate.

5. The Economic Team will designate its own Chair.

6.0 Timelines

6.1 The Chairs of the Advisory Committee and Technical Team***s***, along with the respective staff persons, will be responsible for devising timelines, meeting schedules and public involvement to reflect the task recommended in the West Kootenay Boundary Land Use Plan.

7.0 Reporting and the "Review Group"

7.1 The Minister's Advisory Committee will report to the Minister of Forests.

7.2 The Minister's Advisory Committee will keep a "Review Group" informed of progress and seek advice from the Review Group as appropriate.

7.3 The Review Group will include City Council and the Area B and E Regional Directors, with the District Forest Manager and the City Administrator serving as ex-officio members. This group will be chaired by the Mayor.

7.4 The Review Group will provide comments directly to the Minister of Forests either concurrently or immediately following submissions of the Minister's Advisory Committee to the Minister of Forests. This group is meant to create a "community fail safe" process with community accountability and credibility by providing opportunities for the municipal and regional government to communicate directly with the provincial government in a government to government relationship.

Chapter B – Resource Management

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Note: The format of the *Kootenay-Boundary Land Use Plan Implementation Strategy* (Chapter 2, June, 1997) has been adopted and incorporated as much as possible in this chapter, with key revisions, additions and deletions that are appropriate to the Revelstoke area. ***Key revisions and additions are highlighted for easy reference.***

B. 1.1 Overview

Chapter B outlines the resource management recommendations for the Revelstoke area. These recommendations build on the Revelstoke Land Use Planning Negotiating Committee report and map (March 1995). The format of the *Kootenay-Boundary Land Use Plan Implementation Strategy* (June 1997) has been adopted and incorporated as much as possible, with key revisions, additions and deletions that are appropriate to the Revelstoke area. The components that are key to the recommendations for Revelstoke are highlighted for easy reference.

The three subsections contain information at increasing levels of detail and geographic precision as follows:

- **General Direction (Section 2)**
  This section includes broad objectives and strategies for each of the industrial, conservation and social resources and industries.

- **Guidelines (Section 3)**
  Management practices for specific resource values and the area where these practices are to be applied are included in this section. The Revelstoke and Area Land Use Planning Recommendations map shows the location of the key values at a more detailed scale than the maps in the text of this section. This map is available from the Columbia Forest District of the Ministry of Forests (250-837-7611).

- **Landscape Unit Values, Objectives and Strategies (Section 4)**
  This section begins with a landscape unit map which shows the location of each landscape unit and its number. For each landscape unit there is a brief description of the resource values in the unit as well as a listing of the resource management objectives and strategies that apply in the unit.

  This section was initially developed for the polygons identified by the Community Negotiating Committee. As the next level of planning under the Forest Practice Code will be carried out on ‘landscape units’, which differ from the defined polygon areas mainly because they include whole drainages, the Advisory Committee decided to recompile this information according to this new planning unit to facilitate implementation of the recommendations. Every effort has been made to retain the information that was provided for the polygons.

B. 2.1 Explanation of General Direction

The following objectives and strategies apply to all Crown land and natural resources, as well as private land within Tree Farm Licenses, in the Revelstoke area (defined by the boundaries of the Revelstoke Forest District before the recent amalgamation with the Golden Forest District) unless otherwise indicated. Given that certain resource activities (e.g., logging and mining) are not permitted in provincial and national parks, some of the objectives and strategies will only apply to Crown land outside of parks. However, it is necessary to cooperatively manage values both within the parks and the adjacent areas to ensure that parks can effectively protect the sensitive values contained within them. Therefore, appropriate objectives and strategies from this plan, particularly those associated with environmental, recreation and tourism values, will be incorporated in the management of provincial parks.

The objectives and strategies are intended to provide broad, corporate guidance to agencies and resource users for managing the environmental, social and economic resources in the area and to guide agencies in the development of their individual and inter-agency program priorities.

Within some of the strategies, a target is provided, indicating a desirable or plausible resource production output, resource allocation amount, or a timeline within which the strategy is intended to be initiated or completed. Targets, where provided, represent approximate outcomes which are considered feasible. They should not, however, be interpreted as binding on the authority of statutory decision-makers to exercise their discretion in making resource management and administrative decisions for which they are responsible. Where targets are not provided within individual resource strategy statements, it is intended that the strategy will be implemented in an integrated manner, recognizing and considering the stated objectives, strategies and targets for other resource values.

Some of the terminology used to describe objectives and strategies is relatively subjective and open to interpretation. Definitions of key terms are, therefore, provided in the glossary located at the end of the strategy to promote consistent interpretation of the intent of strategies and objectives. It is recognized that a technical working glossary will need to evolve over time as issues surface in delivering this strategy.

Implementation of the objectives and strategies is intended to occur over time, in general conformance with the action plan developed annually by the local government agencies.

B. 2.2 Economic Values

A. TIMBER RESOURCES	
1. Maintain a sustainable, secure, long-term timber supply.	**1.1** The Provincial Forest Land Commission will maintain and manage the Forest Land Reserve designation over an area covering approximately 340,000 hectares of productive forest land in the Revelstoke area, in accordance with the provisions of the *Forest Land Reserve Act.* **1.2** Subject to the range of objectives and strategies identified in this plan, specific strategies will be identified within the Forest Land Reserve, and especially within the Enhanced Resource Development Zone (Timber) for maintaining and increasing the land base that is available for timber management and supply. ***46.1*** Timber management activities will be recognized as appropriate land uses in all resource zones, outside of protected areas.
2. Ensure the availability of the short term timber supply.	**2.1** Strive to achieve a minimum of two years of approved wood under cutting permits for all forest licensee and tree farm license tenure holders every year following plan approval. Develop a monitoring plan that facilitates corrective action if needed to ensure adequate approvals. **2.2** Forest licensees and the Small Business Forest Enterprise Program will develop spatially explicit long term (20 year) harvesting plans.
3. Consistent with the objectives and strategies within this plan, maximize the sustainable supply of timber for harvesting.	**3.1** An inventory of timber resources will be improved and coordinated with other resource value inventories, consistent with evolving Ministry of Forests inventory standards.

	3.2 A timber management strategy will be developed and implemented to mitigate the predicted falldown in the annual timber harvest levels that will occur over the short to midterm. The timber management strategy will be delivered through a combination of administrative structures, and will focus on: • silviculture systems and activities • restoration of damaged watersheds • rehabilitation of previously disturbed forest land (i.e., roads and landings) • research into harvesting techniques, estate modelling, non-recoverable losses, etc. • forest inventories **3.3** The timber management strategy will provide guidance to future funding allocation by Forest Renewal BC. **3.4** Timber management activities will be emphasized through use of the Timber Enhanced Resource Development Guidelines in appropriate areas initially within Enhanced Timber Resource Development Zones (Timber) *Resource Management Guidelines Chapter B Section 3.9*), with a view to increasing the allowable annual timber harvests while meeting the biodiversity emphasis assigned for that landscape unit. Further work will be undertaken to finalize suitable criteria, candidate areas and Enhanced Resource Development Zones (Timber) boundaries. **3.5** Reasonable and attainable maximum acceptable annual fire loss objectives and reasonable and attainable annual pest damage objectives will be established. **3.6** ***In the short term (5-10 years) the final strategy will deliver 462,000 cubic metres of timber annually based on the analysis results available.*** This timber target may need to be modified due to implementation of related initiatives in the Jobs and Timber Accord. Also, the timber target may not equate to future Allowable Annual Cuts as the Chief Forester retains the sole responsibility for such determinations and may choose a different allowable harvest level.

4. Increase value-added employment in the timber sector.	**4.1** The long-term potential of value-added manufacturing will be promoted through the development and implementation of proven timber quality objectives and strategies for specific ecosystem types. **4.2** The value-added wood manufacturing sector will be expanded through a variety of initiatives, including ongoing revisions to the Small Business Bid Proposal sale criteria and the small scale salvage program. **4.3** Revelstoke will continue to support the appointment of a director from this area to the Kootenay WoodVine, an organization that encourages communication among value-added producers and promotes cooperative marketing, training and business support. **4.4** Efforts will be made to promote capturing the highest value from forest stands for all timber products (plywood, clear lumber, pulp, fine grained material, etc.).
5. Manage the timber resources in accordance with integrated resource management principles and practices.	**5.1** The responsible agencies will implement and administer the provisions of the *Forest Practices Code of British Columbia Act*, and associated regulations and guidebooks, as a primary means of ensuring the sustainable management of all forest resource values and ecosystems. **5.2** ***To facilitate Forest Practices Code implementation, a landscape unit planning strategy, which identifies a schedule for finalization of landscape unit boundaries and objectives, will be prepared within a year after the plan has been approved by government.***
6. Increase opportunities for alternative forestry operations.	**6.1** Where economically feasible and ecologically appropriate, sensitive, innovative and labour-intensive approaches to timber harvesting and silviculture will be promoted. **6.2** The number of woodlots within the area will be increased from 2 to 3. Location and management of all woodlots will consider the range of objectives and strategies in this plan.

	6.3 Opportunities for reducing, reusing or recycling wood residue and/or utilizing its energy value will be explored. **6.4** Where necessary, existing woodlots (established prior to June 1997) may be exempted from the seral requirements of the Forest Practices Code Biodiversity Guidebook. Where exemptions have been granted and old growth must be conserved, consider partial cutting of old growth (i.e., no requirement for interior conditions). ***6.5 On all woodlots, innovative approaches to implement the resource management guidelines in this plan, while achieving the resource management objectives, will be encouraged in order to minimize negative economic impacts.***

B. ENERGY RESOURCES	
7. Maintain opportunities for access to Crown land for potential development of oil and gas, geothermal resources and other energy-related projects.	**7.1** Opportunities for energy resource exploration and development will be made available on all lands outside of protected areas, subject to standard regulatory approval processes and conditions and in accordance with the range of resource management objectives and strategies. **7.2** Access to Crown land for energy exploration and development will be undertaken in conformance with the Oil and Gas Handbook and Guidelines, with a requirement for access development to demonstrate sensitivity to environmental, visual and recreational values, where these have been identified. **7.3** Local level strategic planning will be provided with appropriate information on oil and gas and geothermal resource values, and other energy related projects, to ensure the integration of energy resource interests into the planning results.
8. Encourage development of energy resources to provide local employment and investment.	**8.1** The Ministries of Employment and Investment and Energy and Mines will support appropriate surveys and research, by industry, government and academic institutions, on energy resources.

C. MINERAL AND COAL RESOURCES	
9. Maintain a healthy investment climate to promote exploration and development of new mining opportunities.	**9.1** Opportunities for mineral and coal tenure acquisition, exploration, development and mining, including access development to those tenures, will be maintained on all lands outside of protected areas. **9.1.1** These same opportunities will be maintained for placer resources on all Designated Placer lands. **9.2** Prior to road deactivation, consultation with affected mineral and placer tenure holders will continue and, where feasible, will be enhanced. In the case of watershed restoration projects which currently utilize FRBC funding, consultation will be based on protocols developed by MEM, MOF and FRBC. **9.3** Existing "no staking" and "conditional" mineral, coal and placer reserves will be reviewed with the Kootenay Inter-Agency Management Committee with a view to amending or canceling unnecessary or redundant reserves. **9.4** The coal, mineral and placer exploration and development permitting process will be streamlined through multi-agency protocols and memorandums of understanding. **9.5** Technical data and information will be provided to the exploration industry to promote new mineral and coal opportunities (e.g., industrial minerals and value-added technology). **9.6** The Ministry Energy and Mines will support geological surveys and research, by industry, government and academic institutions, on mineral resources.
10. Ensure sound, responsible management of mineral, coal and placer resources.	**10.1** All mineral, coal and placer activities will be subject to standard regulatory approval procedures and conditions, including, in the case of major mining proposals, the *Environmental Assessment Act*. **10.1.1** Approval conditions, including bonding, will ensure required reclamation of disturbed sites is completed.

D. AGRICULTURE	
11. Maintain or enhance the current level of grazing activity.	**11.1** Grazing will be considered an appropriate Crown land use, subject to the terms and conditions identified in approved grazing tenures and range use plans and consistent with resource management objectives and strategies. **11.2** Livestock Animal Unit Months on Crown land in the area will be maintained at approximately 320. Livestock increases may occur when forage enhancements increase the sustainable carrying capacity, wildlife interests are met, and Rangeland Ecoystems principles are adhered to. **11.3** Sites with high forage production potential within the Crown Agricultural Land Reserve will be considered a priority for forage production enhancement and livestock use, while maintaining habitat and natural grassland integrity. **11.4** Ensure integrated and coordinated resource management planning at the local operational level.
12. Integrate grazing objectives with operational timber management activities.	**12.1**. A process will be developed for contacting range tenure holders operating within the area to ensure optimum integration of timber harvesting and grazing objectives as stated in Range Use Plans, Silviculture Prescriptions and Forest Development Plans. Where appropriate, Silviculture Prescriptions and Forest Development Plans will detail specific measures to avoid livestock-related plantation damage and the breaching of natural or manmade barriers to livestock movement. Range Use Plans that encompass timber harvesting areas must also detail methods to minimize livestock damage to tree seedlings.
13. Provide opportunities for existing farmers to improve the viability of agricultural operations through expansion onto arable Crown land.	**13.1** Arable lands within the Agriculture Land Reserve (ALR) will continue to be available through application under the *Land Act* in accordance with extensive agriculture and intensive agriculture policies administered by BC Lands. In accordance with government direction, agriculture use will receive priority emphasis for those lands within the ALR.

	13.1.1 The policy guidelines of BC Lands relating to land alienation for agriculture will be reviewed with a view to ensuring appropriate agriculture opportunities result. Criteria will be established for: • defining agricultural land suitability • conservation and mitigation strategies • referral processes • approval mechanisms • multi-agency involvement in development plans
14. Maintain opportunities for water allocation for agricultural uses.	**14.1** Local level strategic planning will be provided with appropriate information on agricultural uses of water to ensure such needs are integrated with other land and resource activities.
15. Reduce agriculture/wildlife conflicts.	**15.1** Partnerships aimed at benefiting both wildlife and agriculture will be promoted between the agriculture industry and wildlife managers. **15.2** The province will continue to support wildlife-agriculture conflict resolution forums. **15.3** Wildlife population and habitat enhancement proposals will consider potential impacts on the agricultural sector. Similarly, livestock Animal Unit Month increase and forage enhancement proposals will consider potential impacts on the wildlife resource.
16. Provide increased economic oportunities within the agricultural sector.	**16.1** A niche agricultural study will be undertaken regionally to evaluate potential opportunities for expansion of economic benefits from the agriculture sector. Similar studies for new agricultural opportunities will be promoted.

E. FISH and WILDLIFE RESOURCES	
17. Maintain sustainable and harvestable populations of fish and wildlife to provide long term and sustainable economic benefits to the region.	**17.1** An annual harvest of big game species and sport fish species will be maintained sufficient to provide fishing and hunting opportunities first for residents and secondly for non-residents. The Provincial Wildlife Harvest Strategy will guide the regulation setting process. **17.2** Maintain inventories of fish and wildlife sufficient to calculate annual allowable harvests that are ecologically sustainable and will not threaten harvest species.

	17.3 Encourage service industries that support fishing and hunting and provide them with input to and information about regulations. **17.4** Encourage economic return from hunting/fishing activities by maintaining these activities over as large a percentage of the Crown land base as possible in order to provide a quality wilderness hunting/fishing experience and avoid overcrowding and associated problems.
18. Maintain a viable guide outfitting industry to service both resident and non-resident hunters.	**18.1** Maintain populations of big game animals sufficient to provide ecologically sustainable populations and to maintain a commercial harvest. **18.2** Maintain the largest percentage of the annual allowable harvest (AAH) for resident hunters. **18.3** Maintain a percentage of the AAH for commercial use consistent with ensuring the viability of the industry. **18.4** Maintain the present tenure system for licensing of guide outfitters to both provide certainty for the industry and ensure sustainable distribution of activity across the land base. **18.5** Provide the industry with sufficient information in a timely fashion to allow planning.
19. Ensure a viable angling guide industry to service both resident and non-resident anglers.	**19.1** Maintain populations of popular sport fish species and age classes to provide for a viable angling guide industry consistent with the Fisheries Program Strategic Plan. **19.2** Classify and allocate fishing demand on those water bodies that become overcrowded and require regulation. **19.3** Encourage industries that service sport fishing.

F. COMMERCIAL TOURISM	
20. Planning and design of timber harvesting, forest management, and mineral exploration should consider affected tourism businesses and the resource needs of those businesses.	**20.1** Planning and resource allocation decisions should consider tourism uses of Crown land and resources. These uses include visible landscape, tenures and licenses, and recreational infrastructure such as trails, campsites and roads.

	20.2 In the absence of local level strategic plans, tourism-related tenure holders will develop statements of concern and interest, with the assistance of appropriate resource agencies if necessary.
21. Planning and resource allocation decisions should regard commercial recreation as a valid and appropriate use of Crown land, subject to conformance with legislation and policy.	**21.1** Plans should identify areas with substantial potential to support commercial recreation on Crown land. **21.2** Substantial proposals to allocate tenure or title to Crown land for commercial recreation will be referred to affected agencies and and resource tenure holders for evaluation with consideration to issues including the following: • regional biodiversity connectivity corridors • wildlife habitat and conservation • public recreation • other existing and potential resource uses • other provincial, regional, and municipal plans
22. Where consistent with laws, policy and plans, provincial parks should provide opportunities for commercial tourism.	**22.1** Existing commercial recreation uses (including heli-ski, heli-hiking and cat skiing operations) in provincial parks are acceptable, subject to compliance with management direction statements and park master plans. **22.2** Provincial park planning processes should examine potential commercial recreation opportunities within provincial parks.

G. SETTLEMENT, UTILITY & COMMUNICATION USES OF CROWN LAND	
23. Maintain opportunities for settlement, utility, communication, and other site-specific uses of Crown land.	**23.1** In response to individual proposals, or through proactive marketing methods, suitable Crown land parcels will continue to be allocated for settlement, utility, communication, access, cultivation, industrial uses, aggregate resource extraction, etc. Allocation of lands for settlement use should take into consideration the objectives defined in the Regional section 942.11 (Subsection 2) of the *Growth Strategy Act* (see Appendix B – 2.1) as well as regional district land use bylaws and official community plans and municipal plans.

	23.2 The allocation of Crown Land for settlement purposes will primarily, although not exclusively, be delivered from Crown lands within municipal boundaries, regional district official community plan areas and settlement corridors (*Resource Management Guidelines, Chapter B Section 3.11*). **23.3** Provincial agencies will, as appropriate, participate in official community planning processes and regional growth management strategies initiated by local governments, to ensure that appropriate information on Crown land suitability for settlement and settlement-related purposes is incorporated. **23.3.1** Participation in growth management strategies, official community plans and rural land use bylaws will emphasize a proactive approach for integrating settlement with the full range of land use activities. **23.4** Local level strategic planning may, where appropriate, also identify areas capable and suitable for settlement opportunities.
24. Recognize environmental conservation and other land use and resource management objectives when making decisions on the disposition of Crown land for settlement and other purposes.	**24.1** Proposals for allocating Crown land for settlement purposes will be reviewed on an integrated coordinated basis with other interested agencies. Where possible, allocations will be directed away from regionally significant environmental or resource values, such as biodiversity connectivity corridors, key wildlife habitats and high capability agricultural lands or forest lands and areas of high mineral values or interests. **24.1.1** A coordinated approach to designing and siting utility/transportation corridors will be promoted, particularly within regional biodiversity connectivity corridors, to minimize linear barriers to ecological values. **24.2** The siting of new landfills will respect the management requirements for wildlife (particularly wide ranging carnivores such as black and grizzly bears), water quality protection and the need to minimize the impacts of scavenger species in critical winter ranges and marshes.

H. ACCESS PLANNING AND MANAGEMENT	
25. Provide access, including roads, to accommodate commercial resource assessment, exploration and development.	**25.1** Access for resource uses will be accommodated on all lands outside of national parks, subject to resource management objectives and strategies and other applicable government statutes and policies.
26. Prevent or reduce conflicts between resource access developments and sensitive environmental, recreational and cultural heritage resource values and areas.	**26.1** Access for commercial resource exploration, development and use activities will be subject to the identification and implementation of management measures to mitigate undesirable effects of such activities on other sensitive resource values and areas. **26.2** An access map will be produced over time to identify access opportunities and restrictions for both public and industry uses of the provincial land base. **26.3** Legislative and policy tools will be developed to manage both economic and recreational use of roads and bridges.
27. Address area-specific access related issues.	**27.1** In the absence of local level strategic planning, the level of acceptable access will be assessed via a joint inter-agency process. Where no inter-agency consensus is attained, the regional dispute resolution process will be enacted. **27.2.1** ***The list of priority areas for addressing access requirements will be reviewed annually and amended as necessary.*** **27.2.2** ***Priority areas that are recognized as requiring an enhanced referral process and needing greater consideration for meeting resource management objectives and strategies, are identified in the Chapter B.4 Resource Management – Landscape Unit Objectives and Strategies and summarized in Chapter D.3 – Resource Management Projects. The process for addressing access requirements in such areas is summarized in the Resource Management Guidelines Chapter B Section 3.10.***

	27.2.3 Future priority areas to address access management issues will be evaluated and determined on the basis of screening criteria, including: • public expectations • degree of resource and conservation sensitivity and potential conflict • existing access • level of past investment into resource assessment/exploration/development • imminent or urgent resource development • availability/accuracy of information/inventory on resource values **27.3** A database will be maintained for all roads to enable the calculation of existing and future road densities. **27.4** ***Local level strategic planning that addresses access management issues will be conducted on a cooperative, inter-agency basis and be based on the Access Management Guidelines (Resource Management Guidelines Chapter B Section 3.10).***

B. 2.3 Social Values

A. CULTURAL HERITAGE RESOURCES	
28. Conserve select cultural heritage resources.	**28.1** Archaeological and cultural heritage resource assessments will be undertaken in accordance with legislation and policy respecting the management of such resources. (i.e., a new protocol agreement between Ministry of Small Business Tourism and Culture and Ministry of Forests respecting cultural heritage resource management, the BC Archaeological Impact Assessment Guidelines - 2395, the *Heritage Conservation Act,* the *Environmental Assessment Act,* and the *Forest Practices Code of British Columbia Act,* especially the *Operational Planning Regulation).* **28.2** Archaeological overview assessments will be conducted, where appropriate, to assess cultural resource potential, in order to provide input into subsequent planning, at the strategic, local and operational levels.

	28.3 Archaeological impact assessments will be undertaken and appropriate impact management measures (i.e., buffering, avoidance, access controls, signage, mitigation) will be applied as required, in response to requirements identified through Archaeological Overview Assessments, archeological potential analyses, land/resource planning processes, implementation of the provincial *Environmental Assessment Act*, and to development proposals referred to the Archaeology Branch, Ministry of Small Business Tourism and Culture, by the public or private sectors. In the interim, Archaeological Impact Assessments will focus on high potential sites as defined by Archaeological Overview Assessments. **28.4** Government will continue to support the Traditional Use Site Inventory study process. Archaeological Overview Assessments and archeological potential analyses will be complemented by the results of the Traditional Use Inventory. **28.5** Aboriginal traditional use sites will, as appropriate, be designated as provincial heritage sites under the *Heritage Conservation Act*. **28.6** The Heritage Branch, Ministry of Small Business, Tourism and Culture, will cooperate with appropriate municipal governments, agencies and interest groups to identify and conserve appropriate historic sites, trails, buildings and other structures through designation under the *Heritage Conservation Act*. **28.7** The locations of known cultural heritage sites will be identified on appropriate government reference maps as map notations except those recognized as confidential.
29. Ensure aboriginal rights are not unjustifiably infringed upon by resource development activities of the Crown or its licensees.	**29.1** Consultation with First Nations, as per government policy, will be undertaken for resource management activities which directly affect traditional territories.
30. Encourage development of cultural heritage interpretative facilities and programs.	**30.1** Opportunities for the development of interpretative facilities and programs will be assessed in cooperation with First Nations and local governments.

	30.2 Local level strategic planning will consider signage to identify sites as significant cultural heritage features, and to guide visitor use.

B. COMMUNITIES	
31. Integrate community objectives into Crown land and natural resources planning and decision-making.	**31.1** Crown land and resource planning and decision-making processes will identify measures to minimize and mitigate impacts on the community that may be potentially affected by land and resource allocation and management decisions. Economic diversification and community support initiatives will be emphasized where the community is experiencing impacts requiring a transition strategy to be implemented. **31.2** Community stability will be enhanced over the next decade through adoption of landscape level plans which will contribute to the certainty of the timber supply and will address site-specific issues for access for a range of resource activities and development. **31.3** Development of solid and liquid waste management plans will be promoted as part of watershed management planning processes for community and domestic watersheds.
32. Maintain or enhance employment opportunities and provide economic and social transition measures to maintain community stability.	**32.1** Appropriate government agencies will collaborate with the community and private industry in planning and delivering economic and social development programs and initiatives (e.g., Forest Renewal BC, the Grazing Enhancement Fund, the Canada/BC Infrastructure Program, and the BC 21 program). **32.2** ***As part of the BC Skills Now program, the Revelstoke Community Skills Center will be maintained.***
33. Minimize risk to lives and property from flooding, erosion and wildfires.	**33.1** Alluvial and debris torrent fan hazards will be identified. Where appropriate, mitigation techniques to reduce hazards will be implemented and settlement will be directed away from these areas. **33.2** Watershed assessments will be performed on a priority basis on watersheds upstream of settlement areas in high hazard flood zones.

	33.3 Alternative methods of fuel management will be promoted to assist in the prevention of wildfire and reduce associated damage.

C. OUTDOOR RECREATION	
34. Maintain a range of outdoor recreation settings on Crown land.	**34.1** Recreational settings will be defined using the Ministry of Forests Recreation Opportunities Spectrum. All strategies refer to long-term management; they do not preclude roads and extractive resource development, though they should guide post-operation access management and restoration. **34.2** Alpine and sub-alpine areas should be managed to achieve an Recreation Opportunity Spectrum classification of Semi-Primitive Non-Motorized. Mechanized uses including snowmobiling, heli-ski and cat-ski may be acceptable subject to existing tenure, local level strategic planning and agreements, and wildlife habitat concerns. **34.3** Inoperable terrain below the sub-alpine should be managed to achieve a Recreation Opportunity Spectrum classification of Semi-Primitive. **34.4** Most operable Crown land outside national parks will be managed to a Recreation Opportunity Spectrum classification of Roaded Resource Land or Semi-Primitive Motorized. Some areas of high recreational value, named in the Resource Management Landscape Unit Objectives and Strategies, should be managed such that portions of those areas achieve an Recreation Opportunity Spectrum classification of Semi-Primitive Non-Motorized.
35. Maintain existing recreation features and provide new trails, campsites and related infrastructure.	**35.1** Backcountry recreation corridors, sites and use areas should be managed according to Backcountry Recreation Management Guidelines *(Resource Management Guidelines Chapter B Section 3.8*) of this strategy. **35.2** Strategies and plans should be developed to address management of specific recreation resources and facilities. Priority should be given to strategies for long distance snowmobile trails, recreational river corridors and hiking trails.

D. VISIBLE AREAS	
36. Design of timber harvesting, forest management and mineral exploration should reflect the importance of front country landscapes to communities, recreation and tourism.	**36.1** ***Areas visible from defined viewpoints along Highway 1, Highway 23S and the City of Revelstoke should be designated as "known scenic areas" under the Forest Practices Code during landscape unit planning.*** **36.2** ***Guidelines for management of front country visual areas (Resource Management Guidelines Chapter B Section 3.7) establish design intent for timber harvesting, forest management and mineral exploration in known scenic areas.*** **36.3** In consultation with the community and affected businesses, Ministry of Forests District Managers should establish Visual Quality Objectives (VQOs) for known scenic areas. Standards for these VQOs should be consistent with the management guidelines identified above. **36.4** Alternative silvicultural systems, (e.g., selection harvesting, shelterwood, seed trees), should be applied, where possible and appropriate, in known scenic areas to achieve visual quality objectives. **36.5** Circumstances such as fire and insect or disease outbreak may necessitate logging in known scenic areas which does not conform to the guidelines (*Resource Management Guidelines Chapter B Section 3.7*). Good visual design will, however, be required for all work under these circumstances. **36.6** Mineral exploration and mine development may result in visual disturbance that does not conform to the guidelines. Good visual design should be applied to such work. **36.*7*** ***Further timber harvesting adjacent to existing cutblocks – rehabilitation cutting – should be promoted as a means to improve visual design within some known scenic areas.*** **36.8** The tree height required to achieve visually effective greenup in known scenic areas will be determined through an assessment of local biophysical conditions.

37. Planning and design of timber harvesting, forest management and mineral exploration in backcountry areas should consider visual landscape quality.	**37.1** The Backcountry Recreation Management Guidelines (*Resource Management Guidelines Chapter B Section 3.8*) include provisions for visual management of resource development activities. Design and planning for timber harvesting, forest management and mineral exploration should be consistent with these guidelines where appropriate. **37.2** Where possible, design of cutblocks and roads outside scenic areas and other areas explicitly managed for visuals should reflect principles of good visual design.

B. 2.4 Conservation Values

A. GENERAL ECOSYSTEM HEALTH	
38. Maintain healthy, functioning ecosystems that are essential to the diversity, abundance, distribution and life histories of fish, wildlife, vegetation and aquatic resources.	**38.1** A regional biodiversity benchmark will be maintained which identifies benchmark management regimes and ranks habitats that are critically important to the maintenance of regional ecosystems. The regional biodiversity benchmark will be used to evaluate risk from this strategy and report on the risk to protection, conservation and restoration of critical habitats. **38.1.1** A monitoring program will be developed and implemented to track progress (over space and time) relative to the environmental objectives identified in this strategy, and relative to the regional biodiversity benchmark. Study plots will be identified in protected and non-protected areas as a basis for researching and monitoring ecological change. **38.1.2** A regionalenvironmental supply review will be developed to contribute to the amendment of this strategy and policies, and to conserve and protect healthy functioning ecosystems. The environmental supply review and the timber supply review will utilize the same definition of current management. **38.2** An ecosystem-based approach to land and resource planning and management will be applied. In addition to other resource legislation, regulations and policies, the *Forest Practices Code of British Columbia Act*, will be used as a primary means of implementing an ecological approach to land and resource planning and management.

	38.3 A regional inventory plan will be developed that identifies and ranks information and mapping needed to support planning and management of terrestrial and aquatic ecosystems, and to support the development of air and water quality objectives. The regional inventory plan will identify decision criteria for collecting information on presence/absence, abundance, distribution, life history, and meta-population dynamics of species, associations and communities. **38.4** ***Landscape unit planning will be consistent with this strategy (Resource Management Guidelines Chapter B Section 3.2). A landscape unit planning strategy will be developed within a year after this plan is approved by government, which will identify the process and schedule for finalizing landscape unit specific objectives.*** ***46.1.1To facilitate appropriate application of the biodiversity emphasis options in the mountainous terrain in the Revelstoke area, units have been defined along regional connectivity corridors. It is understood locally that this approach is consistent with the FPC Biodiversity Guidebook, but there is some dispute of this interpretation. Higher level plan status or resource management zone designation is required to implement this biodiversity strategy.*** **38.5** Consumptive uses (i.e. hunting, angling, water allocation, waste emissions) of environmental values will be regulated within the priority to maintain healthy, functioning ecosystems and populations. **38.6** Where private lands provide an important contribution to the maintenance of terrestrial or aquatic ecosystem values, efforts will be made to coordinate public/private land planning and management, and to encourage appropriate conservation measures on private land. A regional private land acquisition program will be initiated to identify critical areas and the means to secure them, should such lands become available. **38.6.1** ***To achieve appropriate conservation measures on private land, the Forest Practices Code should apply to private forest lands classified as managed forest land for tax purposes.***

	38.6.2 Private land managed by the Ministry of Environment, Lands and Parks should be managed according to the overall goals for Crown land, but with a focus on conservation values **38.7** The introduction of non-indigenous plant and animal species into ecosystems will be severely restricted. Over time, efforts will be made to eliminate identified non-indigenous species through ecosystem restoration measures. **38.8** Communication and consultation with the general public, industry, local government agencies and environmental user groups will aim to encourage awareness and voluntary compliance with environmental regulations, and adoption of codes of conduct that are consistent with environmental conservation objectives and strategies in this plan.
39. Protect, conserve, and reduce risks to rare, threatened and endangered terrestrial and aquatic species.	**39.1** In cooperation with the provincial conservation data centre, information will be obtained on rare, threatened and endangered species. The information will be used to monitor, protect and conserve species at risk. **39.2** Inventories of key habitat areas and populations for red and blue listed species will be prepared and maintained and will be integrated into land and resource planning and decision-making processes at all levels. **39.3** Species recovery plans for red, blue or regionally extirpated species will be prepared and implemented. Red, blue and regionally significant or extirpated species that are affected by forest or range practices will be considered candidates for designation as identified wildlife species under the Forest Practices Code (Appendix B-2.2). Essential habitats for these species will be identified and considered for designation as either wildlife habitat areas or sensitive areas under the Forest Practices Code, and addressed in landscape unit objectives. **39.4** Critical habitats of red and some blue listed species will be protected, conserved or restored, (for example, through Goal 2 of the Protected Areas Strategy in the West Kootenays, or provisions of the Forest Practices Code) to manage to the desired habitat condition.

40. Maintain wildland attributes necessary for ecosystem health through coordinated access planning for resource development and associated activities.	**40.1** Site specific access issues will be addressed through local level strategic planning in a cooperative, integrated method and consistent with the Access Management Guidelines (*Resource Management Guidelines Chapter B Section 3.10*).

B. TERRESTRIAL ECOSYSTEM HEALTH	
41. Maintain the diversity and a suitable abundance of native terrestrial species of plants and animals, and the ecosystems upon which they depend.	**41.1** A network of protected areas, landscape scale connectivity corridors, old growth management areas, wildlife tree patches, riparian reserves and appropriate levels of coarse woody debris will be developed and maintained through Landscape Unit Plans and Forest Development Plans Directions to provide opportunities for the distribution of species, populations and genetic material. **41.2** Where appropriate, resource planning objectives and strategies on lands adjacent to, and within, protected areas will be managed to objectives which are consistent with one another within the context of Biodiversity Emphasis Options, Forest Practices Code guidelines, memorandums of understanding and provincial policy. **41.3** Fragmentation of lands suitable for landscape level connectivity corridors (i.e., under represented ecosystems and key habitat areas) will be prevented and minimized through the application of the biodiversity and connectivity guidelines (*Resource Management Guidelines Chapter B Section 3.2).* **41.4** Old growth management areas (as per Forest Practices Code) will be identified, preferably within or in close proximity to connectivity corridors, and will be managed to maintain appropriate interior forest habitat conditions, as per the Forest Practices Code Biodiversity Guidebook. **41.5** Corridors will be managed and used, in accordance with the biodiversity emphasis levels established for those areas (*Resource Management Guidelines Chapter B Section 3.2*), to provide interim management of connectivity requirements until landscape unit boundaries and objectives are finalized.

	41.6 Site-specific resource development activities will, where possible, be designed to resemble the shape and pattern of natural disturbances**.** ***Patch size distribution, as defined in the Forest Practices Code Biodiversity Guidebook, will be deployed to emulate natural disturbance patterns.*** **41.6.1** ***To achieve patch size distribution, the following strategies will be implemented:*** ***a) on the Timber Supply Area and Tree Farm License 23 the general adjacency height (outside of scenic areas and community watersheds) will be changed from 3 metres to 2 metres*** ***b) on Tree Farm Licenses 55 and 56 patch size distribution analysis to meet the FPC Biodiversity Guidebook distribution replaces the adjacency height*** ***c) flexibility surrounding the maximum clearcut size will be exercised consistent with the patch size concepts in the FPC Biodiversity Guidebook.*** **41.7** The coverage, accuracy and resolution of terrestrial ecosystem mapping will be upgraded over time, giving priority to areas of high resource use conflict. **41.8** Landscape unit objectives will consider management of deciduous leading stands such as cottonwoods, aspen and birch for purposes such as biodiversity management. **41.9** Wildlife habitat areas as defined in the =Identified Wildlife Management Strategy will be established where the need is identified during landscape unit planning. **41.9.1** Road access development in key alpine habitats will be managed with mitigation standards and procedures, as they relate to regulated closure, reclamation and rehabilitation, to be pre-determined prior to approval. **41.9.2** Guidelines will be prepared and implemented to minimize disturbance of wildlife populations in winter habitat areas resulting from recreation and commercial tourism, in particular, snowmobiling activities.

42. Maintain the diversity and a suitable abundance of wide ranging carnivore populations and the ecosystems upon which they depend.	**42.1** The quantity and quality of wide ranging carnivore habitat capability/suitability mapping will be upgraded, with a priority on grizzly bears. **42.2** Prey species will be maintained at levels necessary to maintain viable populations of wide ranging carnivore species. **42.2.1** Viable populations of prey species will be maintained through the implementation of the Forest Practices Code and hunting and trapping regulations. If predation increases on mountain caribou, alternative management approaches to reduce this predation will be implemented. **42.3** ***Grizzly bear management plans and management areas will be established in accordance with the provincial grizzly bear conservation strategy. Consistent with provincial policy direction, grizzly bear management areas, and associated management strategies, will not result in additional constraints on the timber supply in the short term.*** **42.3.1** Priorities for grizzly bear inventory, management and planning will be in those areas where populations are most at risk and where high quality grizzly habitat exists. **42.4** ***Grizzly bear management guidelines will be implemented in areas with known high grizzly densities and known high risk areas (Resource Management Guidelines Chapter B Section 3.3).*** **42.5** Local level strategic planning will incorporate information on grizzly bear densities, habitat and movement, with a view to maintaining target road densities (*Resource Management Guidelines Chapter B Section 3.3*) for high density or high risk grizzly areas. **42.6** Food production (e.g., berries) will be encouraged in silviculture prescriptions in key grizzly areas. Herbicides will not be used for forest management on key forage areas, unless the forage opportunities are maintained or enhanced.

	42.7 The Kootenay problem bear translocation policy will be implemented and will identify translocation opportunities in the event that public safety issues arise **42.8** Bear/human conflicts will be minimized in forested areas through access management and adequate trail and campground design in recreation areas. **42.9** ***Bear/human conflicts will be minimized in the City and rural areas by reducing bear attractants, primarily through planning and enforcement, particularly at landfills, and increased awareness and understanding amongst citizens about bear habits.***
43. Maintain the existing mountain caribou populations.	**43.1** ***Mountain caribou guidelines will be applied in key caribou habitat (Resource Management Guidelines Chapter B Section 3.5) at the stand and landscape level. Landscape unit objectives and Forest Development Plans will reflect the intent of the caribou guidelines***. **43.2** ***In areas where caribou habitat overlaps with ungulate winter range, the management for caribou, including application of the mountain caribou guidelines, will take precedence.*** **43.3** ***Guidelines will be prepared and implemented to minimize disturbance of mountain caribou populations in winter habitat areas with respect to recreation and commercial tourism, in particular, snowmobiling activities.*** ***43.4 As the long-term viability of the Revelstoke herd depends on maintaining connectivity with the northern herds, particularly the Wells Gray herd, land use decisions for the connection routes in the Okanagan LRMP and the Kamloops LRMP must reflect the need for continued caribou habitat management in these areas.***
44. Maintain the diversity of viable populations of ungulate species and the critical habitats on which they depend.	***44.1 The quality of information on species-specific habitat requirements and ungulate habitat capability will be upgraded, over time, through field research and inventory mapping, and will modify the guidelines annually for use in the District Manager Forest Development Plan directional letter.***

	44.2 ***Ungulate management guidelines will be applied to critical ungulate winter habitat areas (Resource Management Guidelines Chapter B Section 3.4).Where caribou habitat or biodiversity management guidelines also apply, management practices will meet all the requirements.*** **44.3** Ungulate forage and habitat enhancement measures (e.g., prescribed burning) may be undertaken in critical winter range and habitats, or as determined through local level strategic planning and ongoing environmental program delivery initiatives. **44.4** Local level strategic planning will incorporate information on ungulate habitats and movement, with a view to reducing stress and displacement of wintering ungulates and maintaining target road densities (*Resource Management Guidelines Chapter B Section 3.4*). ***44.5 Road and rail kill of ungulates will be minimized through cooperation between BC Environment and the authorities responsible for design and maintenance of highways and railways, driver education, and, where appropriate, enforcement of highway speed limits.***
45. Maintain and diversify the recreational value of wildlife.	**45.1** Quality sport hunting opportunities of ungulates will continue to be offered to residents and non-residents of British Columbia. **45.2** Wildlife viewing will be encouraged at times and places that do not put undue stress on wildlife species and populations.

C. AQUATIC ECOSYSTEM HEALTH	
46. Protect and conserve aquatic ecosystem functions and processes.	**46.1** A regional aquatic conservation strategy will be developed to guide decisions on the protection, conservation, restoration and monitoring of aquatic ecosystems. This strategy will incorporate principles of integrated watershed planning and management, established protected areas, appropriate operational practices for land development (e.g., *Forest Practices Code*, *Mineral Exploration Code*,) and relevant legislation (e.g., *Water Act*, *Fish Protection Act*, *Land Act*, etc.).

	46.1.1 A non-point source pollution abatement strategy will be developed and adopted for non-forestry related land based activities. ***46.2 Watersheds and wetlands requiring restoration will be inventoried, prioritized and rehabilitated, primarily through the watershed restoration program of Forest Renewal B.C or other appropriate funding sources. Rehabilitation in fish bearing streams will include wild stock population enhancement and measures to restore sources of large organic debris and streamside vegetative cover.*** **46.3** ***Riparian reserves and management areas will be managed according to Forest Practices Code regulations and the standards and guidelines established in the Forest Practices Code Riparian Management Guidebook.*** **46.4** A regional lake classification system will be implemented as per the Forest Practices Code. **46.5** Forest Practices Code wetland classification and management will be implemented to protect and conserve wetland riparian ecosystems. **46.6** Selected lakes, which currently do not contain fish, will be managed to prevent fish introductions so as to maintain their ecological integrity and serve as baseline indicators of these aquatic ecosystems.
47. Ensure the sustainability of fish species diversity and populations, especially wild fish stocks.	**47.1** Implement the regional fisheries strategic plan which identifies management objectives and strategies for specific fish species. ***47.2 Where appropriate, watershed analysis will be performed on locally significant fish streams using a locally developed hydrological stability assessment process to define appropriate watershed-specific strategies for maintaining/restoring in-stream flows and sediment regimes. Stream systems requiring assessments are identified in Chapter B.4 - Resource Management Landscape Units Objectives and Strategies, and are listed in Chapter D.3 – Resource Management Projects in these recommendations.***

	47.3 The quality of fish habitat inventories (including non-sport species) will be upgraded over time, as a basis for identifying and ranking sensitive/critical fisheries areas (e.g., reaches, pools, rearing areas, spawning areas, migration limits) that require protection and site-specific management action. **47.4** On the basis of inventories, and through landscape level planning, appropriate fish habitats may be designated as sensitive areas or be classified under the Forest Practices Code Identified Wildlife Guidebook as wildlife habitat areas. **47.5** Roads that cause chronic negative impacts to fish (e.g., sedimentation) will be assessed and ranked for adequate maintenance or permanent deactivation, as part of coordinated access management planning initiatives. **47.6** In-stream flows that are adequate to maintain fish stocks will be determined. Consideration of these requirements will be incorporated into water licensing mechanisms.
48. Maintain water quality, quantity and timing of flow at appropriate levels in community and domestic use watersheds.	**48.1** ***Greeley, Hamilton, Bridge and Dolan Creeks are officially designated as community watersheds and will be managed in accordance with the Community Watershed Guidebook under the Forest Practices Code. There will be annual reviews of the existing provincial list of community watersheds to determine additions or deletions.*** **48.2** Domestic Watershed Guidelines will guide timber and subsurface access and resource development activities in domestic use watersheds (i.e., non-community watersheds) (*Resource Management Guidelines Chapter B Section 3.6*). **48.3** Contingency measures should be available for domestic or community water supplies to be remediated if damaged by resource development. **48.4** Water quality monitoring programs will be implemented in community watersheds and other high priority areas through a process of needs identification and prioritization.

	48.4.1 Water quality, quantity and timing of flow objectives will be developed in selected watersheds. **48.5** Engineering guidelines for the construction and maintenance of domestic water supply systems will be developed and promoted. **48.6** The means to share authority with regional governments in the regulation of water use and the protection of water quality, within designated pilot areas, will be explored. **48.7** Water management plans will be prepared in high conflict areas as a component of landscape unit plans. These plans will guide water licensing decisions, community development planning and will provide information to other resource planning processes. **48.8** The merits of requiring all domestic water use to be licensed will be assessed and, if deemed appropriate, amendment of the *Water Act* will be proposed. **48.9** Roads that cause chronic negative impacts to domestic water use will be assessed and ranked for maintenance or permanent deactivation as part of coordinated access management planning initiatives.

D. AIR QUALITY	
49. Maintain air quality within established national and provincial criteria.	**49.1** Airshed management plans will be initiated. **49.2** Industrial emissions (e.g., does not include range and wildlife burns) to airsheds will be limited through pollution prevention initiatives or enforcement of the permits or approvals under the *Waste Management Act*. **49.3** Partnerships with communities and special interest groups will be developed to assist with the development of air quality management plans, and to target actions on localized sources of air contaminants (e.g., agricultural burning and smoke emissions from residences). **49.4** Assistance will be provided to the forest industry to phase-out the use of beehive burners and to identify alternatives for woodwaste disposal.

E. RANGELAND ECOSYSTEMS	
50. Manage rangeland ecosystems within the limits of their sustainable carrying capacity.	**50.1** Forage production and forage removal by both livestock and wildlife will be monitored on an ongoing basis. Management of forage will be modified, as appropriate, based on the monitoring results. **50.2** A sufficient proportion of annual forage production will be retained to ensure rangeland productivity and health. The balance of annual forage production will be appropriately allocated between wildlife and livestock. **50.3** The distribution of rangeland habitats will be maintained over space and time. **50.4** Management strategies and tools (e.g., range riding, salting and water availability or intercept ranges and habitat enhancement) will be applied to enhance the temporal and spatial distribution of livestock and wildlife species within rangeland ecosystems.
51. Maintain and restore the integrity of riparian areas.	**50.1** Riparian management monitoring and demonstration projects will be developed and undertaken so as to provide information to the implementation processes. **50.2** Important riparian areas that need restoration from livestock and other sources of damage will be identified, and suitable rehabilitation and alternate management strategies will be developed and implemented.

Appendix B – 2.1 Application and content of Regional Growth Strategy

Purpose of regional growth strategy

942.11 (1) The purpose of a regional growth strategy is to promote human settlement that is socially, economically and environmentally healthy and that makes efficient use of public facilities and services, land and other resources.

(2) Without limiting subsection (1), to the extent that a regional growth strategy deals with these matters, it should work towards but not be limited to the following:

(a) avoiding urban sprawl and ensuring that development takes place where adequate facilities exist or can be provided in a timely, economic and efficient manner;

(b) settlement patterns that minimize the use of automobiles and encourage walking, bicycling and the efficient use of public transit;

(c) the efficient movement of goods and people while making effective use of transportation and utility corridors;

(d) protecting environmentally sensitive areas;

(e) maintaining the integrity of a secure and productive resource base, including the agricultural and forest land reserves;

(f) economic development that supports the unique character of communities;

(g) reducing and preventing air, land and water pollution;

(h) adequate, affordable and appropriate housing;

(i) adequate inventories of suitable land and resources for future settlement;

(j) protecting the quality of ground water and surface water;

(k) settlement patterns that minimize the risks associated with natural hazards;

(l) preserving, creating and linking urban and rural open space including parks and recreation areas;

(m) planning for energy supply and promoting efficient use, conservation and alternative forms of energy;

(n) good stewardship of land, sites and structures with cultural heritage value.

Appendix B - 2.2 Kootenay/Boundary Region Red and Blue-Listed and Key Regionally Significant (Yellow-Listed) Wildlife Species under consideration as Identified Wildlife through the Forest Practices Code

Key to status: R= Red-listed; B= Blue-listed, Y= Key regionally significant

COMMON NAME	SCIENTIFIC NAME	STATUS	PRESENT In REVELSTOKE
Amphibians			
Coeur d'Alene salamander	*Plethodon idahoensis*	R	
Tailed frog	*Ascaphus truie*	B	
Northern leopard frog	*Rana pipiens*	R	
Spotted frog	*Rana pretiosa*	Y	*
Reptiles			
Painted turtle	*Chrysemys picta*	B	*
Rubber boa	*Charina bottae*	B	
Birds			
Eared grebe	*Podiceps nigricollis*	Y	
Western grebe	*Aechmorphorus occidentalis*	R	*
American white pelican	*Pelecanus erythrorhynchos*	R	*
American bittern	*Bautaurus lentiginosus*	B	*
Great blue heron	*Ardea herodias*	B	*
Trumpeter swan	*Cygnus buccinator*	B	*
Wood duck	*Aix sponsa*	Y	*
Harlequin duck	*Histrionicus histrionicus*	Y	*
American avocet	*Recurvirostra americana*	B	
Long-billed curlew	*Numenius americanus*	B	*
Common golden eye	*Bucephala clangula*	Y	*
Bufflehead	*Bucephala albeola*	Y	*
Barrow's goldeneye	*Bucephalia islandica*	Y	*
Turkey vulture	*Cathartes aura*	B	
Bald eagle	*Haliaeetus leucocephalus*	Y	*
Northern harrier	*Circus cyaneus*	Y	*
Sharp-shinned hawk	*Accipiter striatus*	Y	*
Cooper's hawk	*Accipiter cooperii*	Y	*
Northern goshawk subsp. *atricapillus*	*Accipiter gentilis atricapillus*	Y	*
Broad-winged hawk	*Buteo platypterus*	B	
Swainson's hawk	*Buteo swainsoni*	B	*
Peregrine falcon subsp. *anatum*	*Falco peregrinus anatum*	R	*
Prairie falcon	*Falco mexicanus*	R	
Sharp-tailed grouse subsp. *columbianus*	*Tympanuchus Phasianellus columbianus*	B	
Sandhill crane	*Grus canadensis*	B	
Upland sandpiper	*Bartramia longicauda*	R	*
Forster's tern	*Stern forsteri*	R	*
Flammulated owl	*Otus flammeolus*	B	
Western screech owl subsp.	*Otus kennicottii macfarlanei*	B	

COMMON NAME	SCIENTIFIC NAME	STATUS	PRESENT In REVELSTOKE
macfarlanei			
Northern pygmy owl	*Glaucidium gnoma+B130*	Y	
Long-eared owl	*Asio otus*	Y	
Northern saw-whet owl	*Aegolius acadius*	Y	
Short-eared owl	*Asio flammeus*	B	*
Vaux's swift	*Chaetura vauxi*	Y	*
White-throated swift	*Aeronautes saxatalis*	B	
Black-chinned hummingbird	*Archilochus alexandri*	Y	
Lewis' woodpecker	*Melenerpes lewis*	B	
Williamson's sapsucker subsp. *nataliae*	*Sphyrapicus throideus nataliae*	R	
Pileated woodpecker	*Dryocopus pileatus*	Y	*
Brown creeper	*Certhia americana*	Y	*
Canyon wren	*Catherpes maxicanus*	B	
Western bluebird	*Sialia mexicana*	Y	*
Golden-crowned kinglet	*Regulus satrapa*	Y	*
Red-eyed Vireo	*Vireo olivaceus*	Y	*
Grasshopper sparrow	*Ammodramus savannarum*	R	
Bobolink	*Dolichonyx oryzivorus*	B	
Mammals			
Silver-haired bat	*Lasionycteris noctivagans*	Y	
Hoary bat	*Lasiurus cinereus*	Y	
Northern long-eared myotis	*Myotis septentrionalis*	R	*
Fringed myotis	*Myotis thysanodes*	B	
Townsend's big-eared bat	*Plecotus townsendii*	B	
Southern red-backed vole subsp. *galei*	*Clethrionomys gapperi galei*	B	
Southern red-backed vole (other subsp.)	*Clethrionomys gapperi*	Y	
Northern pocket gopher subsp. *segregatus*	*Thomomys talpoides segregatus*	R	
Least chipmunk subsp. *oreocetes*	*Tamias minimus oreocetes*	B	
Least chipmunk subsp. *selkirki*	*Tamias minimus selkirki*	R	*
Red-tailed chipmunk subsp. *simulans*	*Tamias reficaudus simulans*	R	
Red-tailed chipmunk subsp. *ruficaudus*	*Tamias ruficaudus ruficaudus*	R	
Wolverine subsp. *luscus*	*Gulo gulo loscus*	B	*
Marten	*Martes americana*	Y	*
Fisher	*Martes pennanti*	B	*
Badger	*Taxidea taxus*	B	
Grizzly bear	*Ursus arctos*	B	*
Mountain goat	*Oreamnos americanus*	Y	*
Bighorn sheep subsp. *canadensis*	*Ovis canadensis canadensis*	B	
Moose	*Alces alces*	Y	*
Elk subsp. *nelsoni*	*Cervus elaphus nelsoni*	Y	*
Mule deer	*Odocoileus hemionus hemionus*	Y	*
White-tailed deer	*Odocoileus virginianus*	Y	*
Caribou (southeastern populations)	*Rangifer tarandus*	B	*

COMMON NAME	SCIENTIFIC NAME	STATUS	PRESENT In REVELSTOKE
Fish			
Bull trout	*Salvelinus confluentus*	B	*
Chiselmouth	*Acrocheilus alutaceus*	B	
Mottled sculpin	*Cottus bairdi*	B	
Shorthead sculpin	*Cottus confusus*	B	
Umatilla dace	*Rhinichthys umatilla*	R	
White sturgeon (Kootenay River pop.)	*Acipenser transmontanus*	R	
White sturgeon (Columbia River pop.)	*Acipenser transmontanus*	R	*

Chapter B Resource Management

Section 3.0 Guidelines

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NOTE: The format of the *Kootenay-Boundary Land Use Plan Implementation Strategy* (Chapter 3, June, 1997) has been adopted and incorporated as much as possible in this section, with key revisions, additions and deletions that are appropriate to the Revelstoke area. ***Key revisions and additions are highlighted for easy reference.***

B. 3.1 Explanation of Resource Management Guidelines and Resource Value Maps

A main goal that guided development of these recommendations was to not only provide a long-range, strategic vision for land and resource management, but also to provide sufficient clarity and detail to support local level strategic planning and operational level resource management decision-making. To that end, a series of resource management guidelines and associated resource value maps (as detailed in this section) were developed for key natural resource values. The guidelines and maps work in combination to provide specific, spatially referenced resource management guidance within the context of the overall management objectives and strategies outlined in the Resource Management General Direction. The guidelines supplement other existing resource management guidelines, such as the provincial series of Forest Practices Code guidelines.

Each of the resource management guidelines describes, for a particular value, the type and level of resource management practices/standards that are recommended in order to conserve the integrity of that resource value. The resource value maps are used in tandem with the resource management guidelines to show the recommended spatial extent of guideline application. The geographic locations of the values shown on the maps indicate the areas where the resource value is considered to have provincial, regional or local significance, based on assessments of scarcity and uniqueness of the value.

The information provided in the guidelines and maps will be used to instruct and guide all subsequent land use and natural resource management planning initiatives, including landscape level planning, local level strategic planning and operational planning. The expectation is that, where resource management guidelines overlap on the ground (e.g., where a grizzly bear guideline and an ungulate management guideline apply to the same geographic area), the requirements of all applicable guidelines should be applied, and the most constraining guideline (in terms of restrictions on resource development) should be implemented for that area. This should result in resource management practices that sustain all resource values in the area. Instructions to tenure holders that are issued by agencies responsible for overseeing Forest Practices Code operational planning requirements should clearly indicate the requirement for operational plans to consider the appropriate guidelines in this plan.

The resource value maps contained in this chapter are presented at a relatively small scale and thus provide only a general indication of the recommended extent of resource management guideline application. Larger scale resource value maps (available at the Ministry of Forests Columbia Forest District office in Revelstoke) should be referenced when greater geographical accuracy of resource management guideline application is needed.

The guidelines and associated maps were prepared on the basis of best current information, and in conformance with the planning constraint to limit short-term timber supply reductions in

recognition of community stability requirements. The guidelines are intended to be applied with sufficient flexibility to allow site-specific judgments and decisions which best fit individual circumstances and characteristics, within the context of the overall management objectives and strategies identified in the Resource Management General Direction. However, it is anticipated that the guidelines and maps will evolve over time. Such changes will likely result from a variety of factors, including:

- experience gained in implementation of the guidelines;
- new or better information due to ongoing inventory or research, and;
- refinement of the management direction by moving to a more local or site-specific level which will identify opportunities which could not be addressed at this scale.

Refinements and/or interpretations of the guidelines and/or maps, which may be required to ensure effective 'on-the-ground' delivery, will result from an inter-agency process. The two main vehicles for this purpose are inter-agency agreements (memoranduma of understanding) and landscape unit plans and objectives. Any interpretations or changes to the guidelines or maps will be undertaken in a manner which is consistent with the intent of the guideline and in conformance with *Resource Management General Direction (Chapter B Section 1.2).* ***In conformance with the Kootenay Boundary Land Use Plan provisions for Plan Amendment (see Kootenay Boundary Land Use Plan Implementation Strategy, June 1997, Chapter 6, Section 6.8), substantial changes to the guidelines and/or maps must be publicly reviewed before being approved by the Kootenay Inter-Agency Management Committee.***

B. 3.2. Management for General Biodiversity and Connectivity

B. 3.2.1 Introduction

(a) Guideline Intent

- To provide strategic direction for the management of General Biodiversity. As per the Forest Practices Code Biodiversity Guidebook, management for general biodiversity is based on the following principles and assumptions:
  - The more that managed forests resemble the forests that were established from natural disturbances, the greater the probability that all native species and ecological processes will be maintained.
  - The habitat needs of most forest and range organisms can be provided for by:
    - modeling and maintaining an optimum variety of patch sizes, seral stages, and forest stand attributes and structures across a variety of ecosystems and landscapes
    - maintaining connectivity of ecosystems in such a manner as to ensure the continued dispersal and movement of forest- and range-dwelling organisms across the landscape
    - providing forested areas of sufficient size to maintain forest interior habitat conditions and to prevent the formation of excessive edge habitat.
  - To sustain genetic and functional diversity, a broad geographic distribution of ecosystems and species must be maintained within forest and range lands.
  - To ensure that management for biodiversity is flexible and adaptive.
  - To maintain in perpetuity all existing native species across their historic distribution.
  - To manage for biodiversity across and within Landscape Units.
  - The conservation of biodiversity depends on a coordinated strategy that includes:
    - a system of protected areas at the regional scale
    - provision for a variety of habitats at the landscape scale
    - a system of connectivity corridors to enable genetic flow and recolonization potential
    - management practices that provide important ecosystem attributes at the stand scale.
- To maintain opportunities at the regional level for genetic exchange between populations and for shifts in the distribution of whole ecosystems in the face of catastrophic events. The intent is to also use the system of regional connectivity corridors to enhance management of rare habitats, red/blue listed and other regionally significant species, and ecosystems that are under-represented in the protected areas (i.e. < 12% by ecosection, bears, wolverines, etc.)

(b) General management approach

Connectivity corridors

The above intent will be achieved by applying the following general measures:

- the viability and effectiveness of core protected areas, as has been identified through the Goal 1 process of the Protected Areas Strategy, is enhanced through support zones and regional landscape connectivity (i.e. linkage corridors) which creates a network for genetic exchange and dispersal (see Map B1)
- the connectivity corridors to provide for genetic exchange and dispersal, the seasonal migration of a variety of species which therefore requires efforts to minimize further human-development linear barriers and rehabilitate existing barriers where appropriate.

Biodiversity emphasis options

The three biodiversity emphasis options are designed to provide a different level of natural biodiversity and a different risk of losing elements of natural biodiversity:

- The lower biodiversity emphasis option may be appropriate for areas where other social and economic demands, such as timber supply, are the primary management objectives. This option will provide habitat for a wide range of native species, but the pattern of natural biodiversity will be significantly altered, and the risk to habitat suitability, capability and effectiveness will be high.
- The intermediate biodiversity emphasis option is a trade-off between biodiversity conservation and timber production. Compared to the lower biodiversity emphasis option, this one will provide more natural levels of biodiversity and a reduced risk of eliminating native species from the area.
- The higher biodiversity emphasis option gives a higher priority to biodiversity conservation but would have the greatest impact on timber harvest, lower risk to extirpation of species.
- Specific direction on biodiversity management practices, such as the establishment of forest ecosystem networks, wildlife tree patches, old growth management areas, seral stage distributions, and coarse woody debris requirements within the three biodiversity emphasis options is outlined in the *Landscape Unit Planning Guide* and the *Forest Practices Code Biodiversity Guidebook.*

Mature Plus Old and Old Seral Targets

Establishing mature plus old and old seral targets is the primary purpose in landscape unit planning. Management strategies to achieve these targets must be flexible and adaptive. The objective is to plan the landscape unit so as to meet seral targets as soon as possible. Planning design should be ecologically sound while providing opportunities to harvest timber.

Several options can be considered for designing landscapes to meet conditions for mature plus old and old seral targets while maintaining opportunities for harvesting. Some of the options appear below:

1. Setting up a problem solving forum at the district planning level that interprets and agrees to design landscapes that meet seral targets with negotiated approaches to achieving short term wood supply in an ecologically sound manner.

2. Design landscapes in a matrix of patch sizes according to the guidebook which would facilitate reducing green-up and adjacency constraints and therefore free up short-term wood. This is an ecologically appropriate approach and an example of how to work towards this patch size matrix objective would be to immediately reduce green-up in general forestry areas from 3 meters to 2 meters and have no adjacency rules applied for partial harvesting. Another approach may be to use the early seral targets in the guidebook as a planning guide to approving cutting permits rather than using green-up standards.

3. Manage old,and old plus mature seral stage requirements to ensure representation at the subzone variant level within each landscape unit.

4. Where mature plus old and old seral deficits exist in High and Intermediate Emphasis interim Landscape Units, design a recruitment strategy that will identify Old Growth Management Areas and mature areas that will meet the seral targets in the shortest time frame and incorporates the most appropriate areas to meet connectivity, ecosystem representation, and interior conditions. The general management approach is not to harvest old seral stands if the landscape unit is currently below the seral target. However there may be exceptional circumstances where it makes ecological sense to harvest a small portion of old seral if other areas can be recruited in large patches.

5. Where there currently is an excess of mature plus old or old in a landscape unit, where possible, the general management approach would be to plan harvesting in the youngest of the stands first.

6. Where no harvesting opportunites appear to exist other options could be persued such as:
   - Old growth could be reduced to 1/3rd of the target in Low Emphasis. The amount of draw down should be based on a management unit (Tree Farm Licence/Timber Supply Area) and landscape specific circumstances and recruitment strategies should be in place to confirm that the full target can be achieved by the end of the third rotation.

   - If definitions of the desired attributes for old and mature forests can be established, managing younger forests to develop these attributes, as well as setting aside existing old and mature forests now, may be ecologically sound.

   - Silvicultural standards could be modified to achieve old attributes in a shorter time frame when recuiting from younger stands.

- Varying age definitions for certain species profiles might be a suitable option that could be used to meet targets while achieving landscape seral target objectives. Discussion of such changes will be undertaken preferably within the context of a coordinated provincial process involving Ministry of Forests, Ministry of Environment, Lands, and Parks, Industry and Environmentalists.

- Using alternative targets from the ones used in the guidebook is possibly another suitable option. Discussions of such changes will be undertaken preferably within the context of a coordinated provincial process involving Ministry of Forests, Ministry of Environment, Lands and Parks, Industry and Environmentalists. These type of changes would be backed up with data and scientific scrutiny.

Chapter 5 of the *Higher Leve/ Plan Policy and Procedures* and the *Landscape Unit Planning Guide* provides direction on assigning biodiversity emphasis options and achieving seral target objectives.

Connectivity management

The following principles regarding connectivity management will be refined and reflected in local level strategic planning processes. In the interim, these principles are to be used within the allocated biodiversity emphasis options to address the spirit and intent of regional connectivity during operational planning and decision-making:

- to meet habitat requirements, mixed plant species management will be promoted, with an emphasis on species which naturally occur on specific ecosystems
- within the allocated emphasis options, efforts should be made to concentrate retaining attributes in areas adjacent to protected areas
- within the allocated emphasis options, maintain existing old growth stand attributes through designation of old growth management areas and forest ecosystem networks within the connectivity corridors wherever possible
- promote a coordinated, planned approach to minimize linear barriers in low passes to accommodate movement
- when connectivity corridors overlap with other values requiring access management (e.g. priority grizzly bear habitat, ungulate winter range, sub-alpine/alpine grasslands, wildland areas or mountain caribou habitat) the priority for access planning, regulation and/or rehabilitation will be within the connectivity corridors
- a private land acquisition program (see Resource Management General Direction) will focus on critical habitats within connectivity corridors should such lands become available.

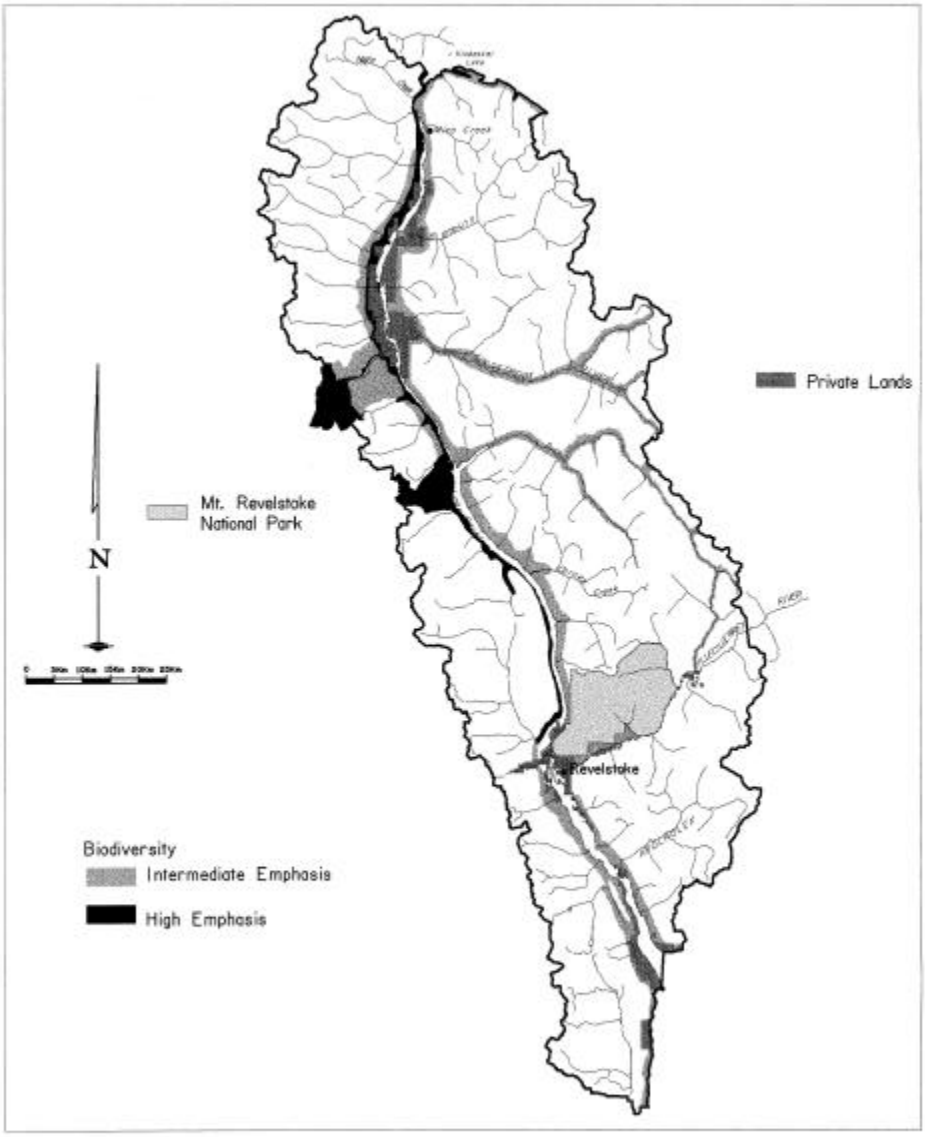
B. 3.2.2 Biodiversity Resource Emphasis Assignment in the Revelstoke Area

To facilitate appropriate application of the biodiversity emphasis options in the mountainous terrain in the Revelstoke area, units have been defined along regional connectivity corridors. While it is understood locally that this approach is consistent with the Forest Practices Code Biodiversity Guidebook, there is some dispute of this approach within government outside the cal level. See Map B1 for the recommended location of high, intermediate and low biodiversity emphasis.

Chapter 5 of the Higher Leve/ Plan Policy and Procedures recommends allocation of biodiversity emphasis options with 10 per cent of the land base in high emphasis, approximately 45 per cent in intermediate emphasis and approximately 45 per cent in low emphasis. Implementing these recommendations as well as managing for mountain caribou in high quality habitat areas would have had unacceptable timber supply and resource development impacts in the Revelstoke area.

To minimize these impacts, areas having the highest quality biological values and the least interaction with development values were assigned high and intermediate emphasis. Consequently, important regional connectivity corridors, underrepresented ecosystems for protection of old growth, and critical mountain caribou habitat were considered in the allocation of high and intermediate biodiversity emphasis options. As much as possible, high and intermediate biodiversity emphasis was assigned to overlap the management area for several environmental values including mountain caribou, ungulates, riparian areas and some fisheries, to minimize the collective implications to the timber supply. Also, as the management guidelines for mountain caribou (see Section B. 3.6) are very similiar to the requirements for intermediate biodiversity, the area assigned to mountain caribou habitat was considered to contribute to the intermediate biodiversity target.

In 1996, when the biodiversity emphasis recommendations were developed, the calculation of the per cent area assigned to high and intermediate was based on the current forest inventory and operable area. This analysis indicated 9.6 per cent of the operable area was assigned to high emphasis, with 22 per cent assigned to intermediate emphasis, and 23 per cent assigned to caribou management. Since 1996, a new forest inventory has been completed, new operability lines have been developed, and the Landscape Unit Planning Guide has clarified that the 'timber harvesting landbase' (the area currently available and suitable for timber harvesting), rather than the operable area (which includes the timber harvesting land base as well as dispersed areas that are unsuitable for timber harvesting) is to be used as the basis for calculating biodiversity emphasis achievement. Table 1 shows how this new information has resulted in changes in the original percentage assignment calculations.



Map B1. Biodiversity emphasis options

Table 1. Percentage of area assigned resource management practices

Date and area	*Percent of area assigned*				
	High biodiversity	*Intermediate biodiversity*	*Caribou management*	*Ungulates only*	*Low biodiversity only*
1996 based on operable area	*9.5*	*22*	*23*	*0*	*45.5*
1996 based on timber harvesting land base	*8.5*	*22*	*23*	*0*	*44.5*
1999 based on timber harvesting land base	*7.5*	*27*	*19*	*5*	*41.5*

The Committee has considered whether to revise the original biodiversity recommendations in light of this new information and have decided to retain the original recommendations, primarily because the total area of high biodiversity assignment is roughly equivalent (10,300 hectares), and these calculations will continue to change as new information becomes available.

As the recommended assignment of biodiversity emphasis areas is not consistent with the current requirements of the Forest Practices Code, the Minister's Advisory Committee recommends that this component of the strategy be granted higher level plan status under the Code. This status provides the legal direction to implement this recommendation although it is not consistent with the current requirements.

B. 3.2.3 Operational Guidelines for the Revelstoke Area

The seral stage requirements for low, intermediate and high biodiversity emphasis for forests within the Revelstoke area generally follow the Forest Practices Code Biodiversity Guidebook outlined in Table 2 at the end of this section, with the following exceptions:

- ***No early seral stage requirements***

As the mature and old forests are the most important biological values in the forests of this area, reduced emphasis is warranted on the early seral stage requirements. Consistent with provincial policy, it is recommended that early seral stage requirements be dropped for managing these forests.

- ***Achievement of seral stage requirements within landscape units (proportionality)***

The unique allocation of biodiversity emphasis along connectivity corridors, and the reduced total allocation below the provincial standard of 10% high/45% intermediate/45% low, makes it critical that the area within these corridors meet the full seral stage requirements as much as possible. Although provincial direction is to fulfill the seral stage requirements using inoperable areas first, this has not been implemented in the Revelstoke area because a very large portion of the forested landscape is inoperable (often as much as 75%), which would lead to little or no biodiversity management within these critical corridors. To ensure the full recommended biodiversity management within the biodiversity corridors, the seral stage requirements must be met proportionally from the operable and forested inoperable portions of each corridor within each landscape unit – areas outside the corridors cannot be counted towards fulfilling the biodiversity requirements of the corridor.

- ***Special practices for Tree Farm Licenses 55 and 56***

The high concentration of biological values in the two northern Tree Farm Licenses (Evans Forest Products TFL 55 and Revelstoke Community Forest Corporation TFL 56) have required adjustments to provincially developed biodiversity practices, as provided for by provincial policy, to achieve acceptable timber supply impacts. Within TFL 55, 80 percent of the operable land base is assigned to management for intermediate biodiversity, mountain caribou or ungulates, while slightly over 85% of the operable area of TFL 56 is assigned to management of these values (compared to 50 percent in the TSA and 30 percent in Pope and Talbot's TFL 23). As reassigning management of these values to other units in the area was not possible because of their specific geographic location within the two TFLs, the following practices were developed to address projected timber supply impacts, without unacceptably increasing the risk to conservation values:

- ***Reduction of mature and old seral requirements***

  Low emphasis biodiversity requirements were reduced consistent with provincial policy as follows:
  - ***no mature seral goals***
  - ***1/3 of the old seral goals required in the first rotation, with the full goal requirements achieved in three rotations.***

- ***Patch size analysis to replace green-up and maximum block size requirements***

The range of patch sizes provided in the Biodiversity Guidebook and Landscape Unit Planning Guide for Natural Disturbance Type 1 (30-40% of area with patches less than 40 hectares, 30-40% of the area with patches 40-80 hectares and 20-40% of the area with patches 80-250 hectares) were analyzed as an alternative for green-up requirements. Patches are mapped and digitized with smaller patches in areas which naturally have smaller timbered areas such as steep, narrow valleys with frequent snow slide chutes, and larger patches on rounded landforms where large fires naturally created large openings.

As spatial distribution of harvesting is now driven by the desired patch size distribution, the usual green-up and maximum block size requirements are not needed. Patch size distribution analysis is required to verify achievement of the desired distribution.

As future timber supply reductions are forecast for the Revelstoke Timber Supply Area, and Tree Farm License 23, the above practices developed for Tree Farm Licence 55 and 56 could be considered for these areas in the future.

Table 2. Biodiversity Emphasis Seral Stage Requirements for the Revelstoke Area

A. Natural Disturbance Type 1

- all of the district except low elevation portions of the valley bottom south of town

Interior Cedar-Hemlock

Guideline	Low emphasis biodiversity	Intermediate emphasis biodiversity	High emphasis biodiversity
Green-up	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested
Early seral	N/A	N/A	N/A
Old and mature (proportional[1])	More than 17% older than 100 years[2]	More than 34% older than 100 years	More than 51% older than 100 years
Caribou (operable area with slopes less than 80%)	More than 40% older than 140 years with 10% being older than 250 years	More than 40% older than 140 years with 10% being older than 250 years	More than 40% older than 140 years with 10% being older than 250 years
Old (proportional[1])	More than 13% older than 250 years[3]	More than 13% older than 250 years	More than 19% older than 250 years

1) This requirement must be met on both the Crown operable forest and the Crown forested landbases, for each variant, within a landscape unit (ie. proportionality)

2) There are no mature requirements in low emphasis areas in Tree Farm Licenses 55 and 56 for three rotations.

3) One third of the old requirement must be met in low emphasis areas in Tree Farm Licenses 55 and 56 for three rotation.

Engelmann Spruce-Subalpine Fir

Age category	Low emphasis biodiversity	Intermediate emphasis biodiversity	High emphasis biodiversity
Green-up	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested
Early seral	N/A	N/A	N/A
Mature plus old (proportional[1])	More than 19% of forested area must be older than 120 years[2]	More than 36% of the forested area must be older than 120 years	More than 54% of the forested area must be older than 120 years
Caribou (operable area with slopes less than 80%)	More than 40% older than 140 years with 10% being older than 250 years	More than 40% older than 140 years with 10% being older than 250 years	More than 40% older than 140 years with 10% being older than 250 years
Old (proportional[1])	More than 19% older than 250 years[3]	More than 19% older than 250 years	More than 28% older than 250 years

1) This requirement must be met on both the Crown operable forest and the Crown forested landbases, for each variant, within a landscape unit (ie. proportionality)

2) There are no mature requirements in low emphasis areas in Tree Farm Licenses 55 and 56 for three rotations.

3) One third of the old requirement must be met in low emphasis areas in Tree Farm Licenses 55 and 56 for three rotation.

B. Natural Disturbance Type 2

- low elevation valley bottom lands south of town - Interior Cedar-Hemlock only

Interior Cedar-Hemlock

Age category	Low emphasis biodiversity	Intermediate emphasis biodiversity	High emphasis biodiversity
Green-up	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested	Harvested areas must be regenerated with forests at least 2 metres tall before adjacent timber is harvested
Early seral	N/A	N/A	N/A
Mature plus old (proportional[1])	More than 15% of the forested areas must be older than 100 years	More than 31% of the forested areas must be older than 100 years	More than 46% of the forested areas must be older than 100 years
Old (proportional[1])	More than 9% older than 250 years	More than 9% older than 250 years	More than 13% older than 250 years

1) This requirement must be met on both the Crown operable forest and the Crown forested landbases, for each variant, within a landscape unit (ie. proportionality)

B. 3.3 Grizzly Bear Management Guidelines

B. 3.3.1 Introduction

(a) Guideline Intent

To provide the amount and distribution of habitat required to maintain suitable population levels and distribution of grizzly bears.

To minimize bear-human interaction so as to avoid human injury and/or mortality as well as the displacement of grizzly bears either through forced relocation or mortality resulting from past human conflicts, habitat loss and excessive hunting.

(b) General Management Approach

The above intent will be achieved by applying the following general measures:

- conserving highly productive and/or critical feeding and breeding habitats, and ensuring bear access to these habitats
- setting road densities and distribution objectives by managing access in designated units (access management measures will be refined through landscape unit planning processes)
- using timber harvesting and silvicultural methods that sustain bear food production
- avoiding residential and recreational development-related conflicts
- eliminating improperly managed carnivore attractants (e.g., uncontrolled landfills)
- using landscape-level forest ecosystem networks (FENS) and regional connectivity corridors to provide dispersal corridors between areas of population concentrations (such as parks)

These guidelines will be refined through adaptive management. Their application will be reviewed to identify potential modifications which may improve the ability to meet the objective of enhancing Grizzly Bear habitat. The guidelines are intended to be applied with sufficient flexibility to allow site-specific decisions that best fit individual landscapes.

B. 3.3.2 Grizzly Bear Priority Habitats

These guidelines apply to Grizzly Bear Priority habitats, identified on Map 2, which represent areas of high grizzly bear density and priority recovery areas. For the purposes of future local level strategic and operational planning, the grizzly areas have been classified into priority 1, 2 and 3 habitat management areas that are derived from habitat suitability indices, as per Fuhr and Demarchi (1994), and a qualitative ranking of draft landscape units within forest districts.

As per the provincial Grizzly Bear Conservation Strategy, grizzly bear management areas will be further defined and designated into a range of management types. These management units will provide for the management of site-specific grizzly bear habitats (e.g., denning and concentrated feeding sites) while ensuring integration with the resource management objectives and strategies.

Grizzly bear habitats will be further defined based on the landscape units and estimated population densities. Further inventory and mapping at the landscape level will identify critical habitats for operational level planning and decision-making and will be used as the basis for modeling seasonal habitat values and conducting a patch and landscape analysis.

Note: Implementation of the Grizzly Bear Conservation Strategy within the context of the land use plan will continue and will result in refinements to these grizzly bear management guidelines and the map of priority grizzly habitats. These refinements will be reflected in subsequent local level strategic planning and operational plans. While the entire guidelines will be reviewed, the * symbol identifies the key aspects which are priorities for discussion. In the interim, the focus on grizzly bear management will be relative to avalanche chutes, access requirements, and site specific identification of feeding sites. It is understood at this time that habitat management requirements for grizzly bears must be achieved within the biodiversity seral age requirements in each landscape unit.

In determining critical foraging, consideration will be given to:

- The importance of the site on a landscape basis, including whether negative impacts on it could potentially limit local populations.
- Cumulative impacts (monitoring and analysis) of nearby developments and activities.

In general, critical areas are defined as those sites which are essential to a grizzly bear's life history. The life requisite variables are food, shelter, breeding habitat, and travel corridors. The following areas are suggested:

- post wildfire shrubfields
- avalanche tracks
- alpine meadows
- riparian habitats
- wet seeps
- other areas identified as critical

These critical habitats will be identified by local level strategic and operational plans. Buffers and/or access management should be maintained around critical habitats, except where greater environmental problems would be created by maintaining a complete reserve within the buffers (such as by re-routing roads into inappropriate locations).

Note: The entire Revelstoke area has been identified at the regional level as Priority 1 or 2 habitat. A more detailed local map is to be developed to more accurately define key habitats.

Map B2. Grizzly Bear Priority Habitats

B. 3.3.3 Operational Guidelines

(a) Interim Direction

To more accurately develop and apply guidelines, better information is required regarding grizzly bear densities and habitat usage. Through ongoing and future inventory and research, such information will be integrated into both local level strategic and operational planning. In the interim, management of grizzly bears will be addressed using grizzly bear management units as defined by the Provincial Grizzly Bear Strategy (see Section 3.2) and biodiversity emphasis option allocation as described in Section 3.2. Within the context of these biodiversity emphasis options, resource managers should, in the interim, seek to apply the intent of these guidelines through operational planning and decision-making with a priority focus on management of avalanche chutes and access requirements.

(b) Forest Harvesting Guidelines

Silvicultural systems commonly used in timber management are clearcuts, seed tree, shelterwood and single or group-tree selection. In some locations, these methods can be used to enhance grizzly food and are discussed in more detail below. Specific harvesting guidelines are suggested as follows:

Clearcuts

- cutblock sizes should vary according to the patch size recommendations within the Biodiversity Guidebook and to site specific concerns that are identified at the Landscape Unit and Forest Development Plan level by BC Environment staff.
- edge can be maximized and sight distance reduced to 200m by creating an undulating cutblock boundary. If access is controlled, this guideline may be modified.
- ***** cuts should be planned so that adjacent harvested units qualify as useable hiding cover as indicated by an analysis of landscape patterns. Harvesting schedules among sub-drainages should also be alternated to meet cover requirements at a Landscape Unit scale.
- clearcuts should be screened from roads by leaving a strip of trees (for example, 50m) to promote bear use of early vegetative stages and to minimize poaching from access roads where appropriate.
- * avoid cutting areas adjoining meadows or other natural openings or foraging areas used by Grizzly Bears, as identified by BCE district staff (see buffers to foraging areas in the forage enhancement section of this guideline).

Partial Cutting

Partial cutting is important to retain security cover adjacent to high quality feeding areas (i.e. avalanche paths and riparian areas). In general, some important herbs and fruit bearing shrubs are also benefited by selection cuts. ***** A specific recommendation for partial cutting is removal of 20 - 50% of the stands basal area, dependent on wind

firmness of affected stand, where it can be accommodated as per the Forest Practice Code and biodiversity emphasis option allocation. Partial cutting may not be appropriate for shade intolerant species such as lodgepole pine when quick regeneration is needed or near clearcuts where adequate cover for travel, escape, and rest may not be available.

Age Structure

Long-term grizzly habitat management should maximize vegetation diversity, approximate natural conditions and include late successional stages. Specifically, managers should work toward maintaining a mosaic of age classes consistent with Grizzly Bear habitat requirements for a particular Landscape Unit. Wherever possible, the distribution should conform to the Biodiversity Guidebook for High and Intermediate Emphasis by NDT.

Seral Stages

Diversity of seral stages is generally the rule when managing forested lands for wildlife. However, some seral stages are of more value as grizzly habitat components than others. Specifically:

- early successional stages are valuable in producing grizzly foods (grasses, herbs, and fruits).
- mid-successional stages and pole-size stands of timber are of less value, particularly if they are dense, single species, even-aged stands.
- over-mature (age class 8+) and mixed aged stands should be retained for thermal cover and denning habitat.
- single entry uneven-aged management is appropriate in some locations to maintain cover..

Forage Enhancement

In areas that are designated by BC Environment as being important for bear foraging, silviculture regimes should be compatible with the maintenance or enhancement of bear food production (e.g., as huckleberry, blueberry, mountain ash, horsetail).

Site preparation methods (Interagency Grizzly Bear Committee, 1986) include:

- prescribed-fire slash removal where it will enhance food production, provided that on some areas large coarse woody debris is maintained and burn intensity is regulated. The ratio of intensity will be determined at a landscape scale using a stochastic distribution process.
- promote soil disturbance that creates the establishment and growth of food plants.

Restocking prescriptions should aim for stand structure and composition similar to that present in adjacent blocks. Clumped tree distribution should be favoured over evenly-spaced stems. Existing openings or gaps in the stand should be identified prior to

harvesting and used as the basis for PHSPs aimed at creating and maintaining gaps and clusters in the managed stand (Hamilton, 1994a).

Vegetation management activities should be restricted to the area immediately surrounding individual trees or clusters of trees. Motor-manual brushing is the preferred method. Treatments should be designed to directly reduce competition with crop trees, so grizzly forage species that are not direct competitors with crop trees will be avoided (Hamilton, 1994a).

Foraging habitats (including high elevation shrubfields, berry patches, alpine meadows, avalanche paths and riparian areas), where identified and mapped by BCE district staff, are to be avoided by managing access and buffering from planned roads and cutblocks. Buffer recommendations for these habitats are 100m on flat ground and greater on steeper slopes.

Timing of Activity

Past and future activities must be put in perspective and harvest planning should consider long term consequences. Cumulative effects analysis procedures are useful for determining the impacts of proposed logging activities on bear populations. Specific suggestions for scheduling harvesting activities follow:

- logging should take place at a time of relatively little or no biological importance to bears.
- logging should be concentrated into the shortest time frame possible.
- ***** logging operation should seek to concentrate the cut and associated activities, therefore providing areas of refuge for grizzly bears within other parts of the drainage. To achieve this intent, the following should be considered: operations should not take place simultaneously on adjacent areas (same or next drainage); a series of cuts at spaced periods to allow regeneration between harvest periods (i.e., 2m green up); large scale permits (>20% B.A. removal) should not be planned on adjacent watersheds (same or next drainage) within short (10-15 years) time intervals; these watersheds should be modeled to achieve optimum levels of Grizzly Bear conservation. Drainages should be alternated when accessed for resource extraction within landscape units, with one side of a watershed being utilized in order to concentrate harvesting impacts.
- timber harvest schedules should be coordinated with other land activities to reduce simultaneous impacts.
- harvesting should be scheduled to optimize vegetation responses beneficial to grizzlies.

Forest Management Adjacent to Snow Avalanche Tracks

In absence of a professional field assessment, the following provisions will apply:

- Snow avalanche tracks (i.e., slide chutes), which are recognized by BCE staff as significant habitats require establishment of Avalanche Track Management Zones (AMZs). The primary objective of AMZs is to ensure sufficient security cover is maintained adjacent to avalanche tracks frequented by grizzly bears.
- ***Timber harvesting adjacent to avalanche chutes should only be permitted on one side of a chute at any time. The area remaining unlogged on the opposite side of the avalanche track from the logged area must be large enough to be a feasible harvesting cutblock in the future. The logged area must be regenerated with new forest that is at least 10 m tall to provide security cover for bears before the forest on the unlogged side of the chute can be harvested***
- Forest harvesting within the AMZs should emphasize retention of cover through the application of partial cutting systems, such as single tree selection or group selection. In general, the objective should be to maintain the stand structure and species composition present in unmanaged stands on similar sites. Tree removal should be limited to approximately 20% of the pre-harvest basal area on one side of an avalanche track on single or widely spaced avalanche tracks. Areas between closely spaced avalanche tracks should be managed on long rotations with infrequent entries.
- Where possible snow avalanche tracks should be crossed at mid slope, and crossings on runout zones in toe slope positions should be avoided to minimize disturbance to bears. Roads which cross avalanche tracks identified as critical carnivore habitat should provide temporary access only, and be closed when not in use.

Forest Management In Riparian Habitat

Riparian zones are heavily used by grizzlies for feeding and as travel corridors. Harvesting is possible with the intent to open up the riparian management zone for forage production, except within the riparian reserve which should be avoided for the purposes of timber harvesting. Specifically:

- Using FPC riparian guidelines for riparian habitats as per guidebook. In site specific stream areas ranked as significant grizzly bear habitats by BCE staff, consideration should be given to manage these habitats as sensitive areas.
- soil disturbance should be minimized particularly on mesic or hydric sites.
- riparian vegetation should not be altered within code designated reserves .
- low intensity broadcast burning or hand piling and spot burning are recommended as site preparation methods. High intensity burns on these sites may destroy rhizomes.
- riparian areas at the base of avalanche tracks should be managed to retain connectivity to upper elevations.

(c) Access Management

In critical grizzly bear habitats active, open forest road density (i.e., currently accessible by motorized vehicles) are generally too high to achieve the desired management for grizzly bears. MOF District Managers must consider ways to reduce these densities. Two pilot projects have been initiated to recommend road density targets that will not significantly affect short term wood supply and safeguard grizzly bears from displacement or harassment.

Targets will vary, depending on carnivore management planning, carnivore densities and factors influencing the effect of roads on carnivores, such as the shape of valley, volume of traffic, location of roads and junctions, timing of use, and visibility.

It is recognized that new roads built for the exclusive purpose of minerals, coal or oil and gas exploration and development, or for human settlement or to access private property and Land Act tenures, are relatively few. In areas of concern within grizzly bear habitat, new road construction for the purpose of mineral exploration, energy development, settlement development, and access to private land will be subject to an enhanced referral (see *Access Management Guidelines Section 3.10.3*) to identify specific operating conditions. In these rare cases where road density is at or near limits, access in the short term will be closely monitored and managed (with possible gated or other closures) and target road densities may be temporarily exceeded. The permitting government agency must promptly notify the Ministry of Forests District Manager of the development application in cases where longer-term access is required. Operational planning will be initiated by government to determine how the targeted road density can be achieved. The siting and timing of construction and use for such roads will be subject to review within the context of these guidelines.

The process and general methodology for managing access within grizzly bear habitat, including strategies to be used to achieve the target road density, are summarized in the Access Management Guidelines (Section 3.10). However, specific direction for access management within and around critical grizzly bear habitat includes:

- emphasizing a concentration of resource development and active roads to small portions of a drainage at any one time, in contrast to concurrent dispersed development activities. For example, this may be achieved by limiting forest harvesting activity at any one time to certain tributaries of a valley, to one side of a valley, the upper or lower portion of a valley, or by closing off all side roads not leading directly to the areas of activity. Under this scenario, all forest harvesting roads should be closed in the portion of the drainage that was originally active before moving into the next portion of the drainage. Where necessary, roads for other resource activities will be regulated through specific permitting conditions identified through an enhanced referral (see Section 3.10.3).
- avoiding roads, where possible, in high-elevation post-wildfire shrubfields, riparian habitat, seepage areas and avalanche slopes.
- identifying specific measures through resource development plans that result in effective permanent or seasonal closures, such reclaiming road designed for short-term access to

- cutting and/or mineral exploration areas and designing main haul roads to incorporate effective physical road closures at impassable barriers, such as river crossings.
- until the Grizzly Bear Conservation Strategy has identified Conservation, Recovery, Benchmark and Sustainable Areas and associated priorities for access management, the priority for access management planning and activities will be where priority grizzly bear habitat overlaps with regional connectivity corridors (see Section 3.2).

Priorities for access management planning, including defining road densities, and related activities, to address grizzly bear conservation in the Revelstoke area are:

- ***highest priority - Tangiers River, Woolsey Creek, Downie/Sorcerer, Akolkolex River, Carnes Creek***
- ***next priority - Goldstream River and the westside of the Columbia River from Frisby Creek to Pat Creek***
- ***lowest priority - Bigmouth Creek***

(d) Attractant Management

Locations for new sanitary landfills should avoid Conservation Management Areas (as per the Grizzly Bear Conservation Strategy). Where this is not possible, there should be a waste management plan/permit which must include plans to minimize attractants available to grizzly bears.

Existing landfills in Conservation Management Areas should be reviewed by BCE staff, and where necessary, a management plan developed to minimize attraction to the area. If landfills occur in key bear habitat and there is a history of problem bears, they should be closed or modified as bear-proof.

Bear/human conflicts will be minimized in the City and rural areas by continuing the Bear Aware program which promotes removal of bear attractants and increased awareness and understanding amongst citizens about bear habits.

All work camps in bear habitat should thoroughly incinerate garbage at least daily, or provide bear-proof garbage containers. These requirements should be included in all permits for activities involving the establishment of camps. All Ministry of Forests, BC Parks, Highways and private campsites should eliminate open barrel waste disposal containers and provide bear-proof containers or require users to independently store and remove their waste for disposal off the site.

(e) Range Management

Expansion of range tenures (cattle, horses or sheep) and sheep vegetation management should be avoided in grizzly bear habitats, unless it can be shown these activities will have no adverse impacts on bear populations.

If there is evidence of damage to critical habitat from domestic grazing in bear habitats, existing range tenures in those areas should be reviewed, and range management plans revised to eliminate the problem. In some cases it may be necessary to consider a temporary cessation of activities, or even cancellation, to resolve a bear-human or carnivore-livestock conflicts.

(f) Recreational Development

Within grizzly bear habitats, environmental impact assessment for new construction or expansion of resorts, backcountry cabins, trails and other recreational developments should include an evaluation of potential impacts on carnivores. Management and development plans may include monitoring of activities and impacts on carnivore habitat and populations to ensure that limits of acceptable change are not exceeded.

(g) Predator Control and Hunting Management

Hunting regulations for grizzly bears and prey species, including hunting access restrictions, should be coordinated with the both Provincial Grizzly Bear Strategy and the BC Environment Harvest Strategy.

(h) Inventory and Research

In order to develop better information for refining these guidelines at the local level strategic and operational levels, licensees will be encouraged to submit proposals for FRBC funded inventory and inventory projects (minimum 3 years) using approved MOELP standards for Grizzly Bears within license areas rated as priority 1, 2 and 3 Grizzly Bear habitats by Ministry Of Environment, Lands and Parks staff. Long term inventory and research projects enable biologists and forest managers to improve both landscape and stand level guidelines.

B. 3.4 Ungulate Winter Range Management Guidelines

B. 3.4.1 Introduction

(a) Guideline Intent

To ensure viable populations of ungulate species including elk, white tailed deer, , mule deer and moose, are maintained. To achieve that goal, these guidelines provide direction with respect to the location, preferred type, distribution and attributes of forest cover, as well as the access management, required to maintain suitable habitat conditions which support the variety and populations of ungulate species.

Ungulate species are managed in the following order of priority: mountain caribou, deer, elk, and moose. Specific guidelines for mountain caribou management are contained in Section 3.5; this section contains guidelines for the remaining species.

To minimize displacement of ungulates resulting from poaching and development activities within designated winter ranges.

Within the context of the land use plan, management of ungulate species is linked to the management of predator species as healthy populations of prey species is necessary to maintain viable populations of large carnivores.

(b) General Management Approach

The above intent will be achieved by applying the following measures:

- The guidelines are intended to be applied with sufficient flexibility to facilitate management decisions which complement desired habitat characteristics over the landscape.
- Management guidelines are intended to be applied by the Biogeoclimatic Ecosystem Classification (B.E.C.) system for all identified ungulate winter ranges throughout the area
- Improve the identification and accuracy of all ungulate winter ranges within the area.
- Utilize available information regarding specific winter range locations, the ranking of species in order of priority for each range and application of specific operational direction to develop appropriate management regimes. Decisions regarding species management priorities can be determined from existing biophysical information, however, this is not an entrenched rule and flexibility is open for interpretation by the appropriate resource managers.
- Manage the identified winter ranges for the optimal amount, quality and arrangement of security and snow interception cover and forage resources. These habitat management objectives will vary according to the target species, local climate and residual habitat conditions.
- Manage access development and use, consistent with the Access Management Guidelines (Section 3.10), to minimize ungulate displacement, habitat degradation or loss and vulnerability to over -harvesting or poaching.
- Within identified winter ranges, ensure that management of other resources is consistent with habitat management goals for ungulates.
- Consistent with provincial biodiversity guideline direction, the old growth seral age requirements will be maintained and distributed throughout all B.E.C. units in landscape units which contain identified wildlife winter ranges.

- Consistent with biophysical attributes, forest habitat cover should be arranged to maintain the most suitable connectivity, interior forest conditions and edge attributes.

(c) Access Management

The primary method of meeting the guideline intent of minimizing habitat loss and the displacement of ungulates from designated winter ranges will be achieved through management of road densities and active use of roads in and around high capability winter habitats. Strategically, road densities should be managed, within the mapped winter ranges, at <3km./km. squared by 250 ha. units. If this road density target cannot be met, appropriate rationale must be provided. Road density targets will be refined in conjunction with winter range status and incorporated into both local level landscape unit and operational planning and negotiation processes.

It is recognized that new roads built for the exclusive purpose of minerals, coal or oil and gas exploration and development, or for human settlement to access private property or Land Act tenures, are relatively few. In areas of concern within ungulate winter range, new mineral/energy/settlement road construction will be subject to an enhanced referral (see *Access Management Guidelines Section 3.10.3*) to identify specific operating conditions. In the rare cases where road density is at or near limits, access in the short term will be closely monitored and managed (with possible gated or other closures) and densities may be temporarily exceeded. The permitting government agency must promptly notify the Ministry of Forests District Manager of the development application in cases where longer-term access is required. Operational planning will be initiated to determine how the targeted road density can be achieved. The siting and timing of construction and use for such roads will be subject to review within the context of these guidelines.

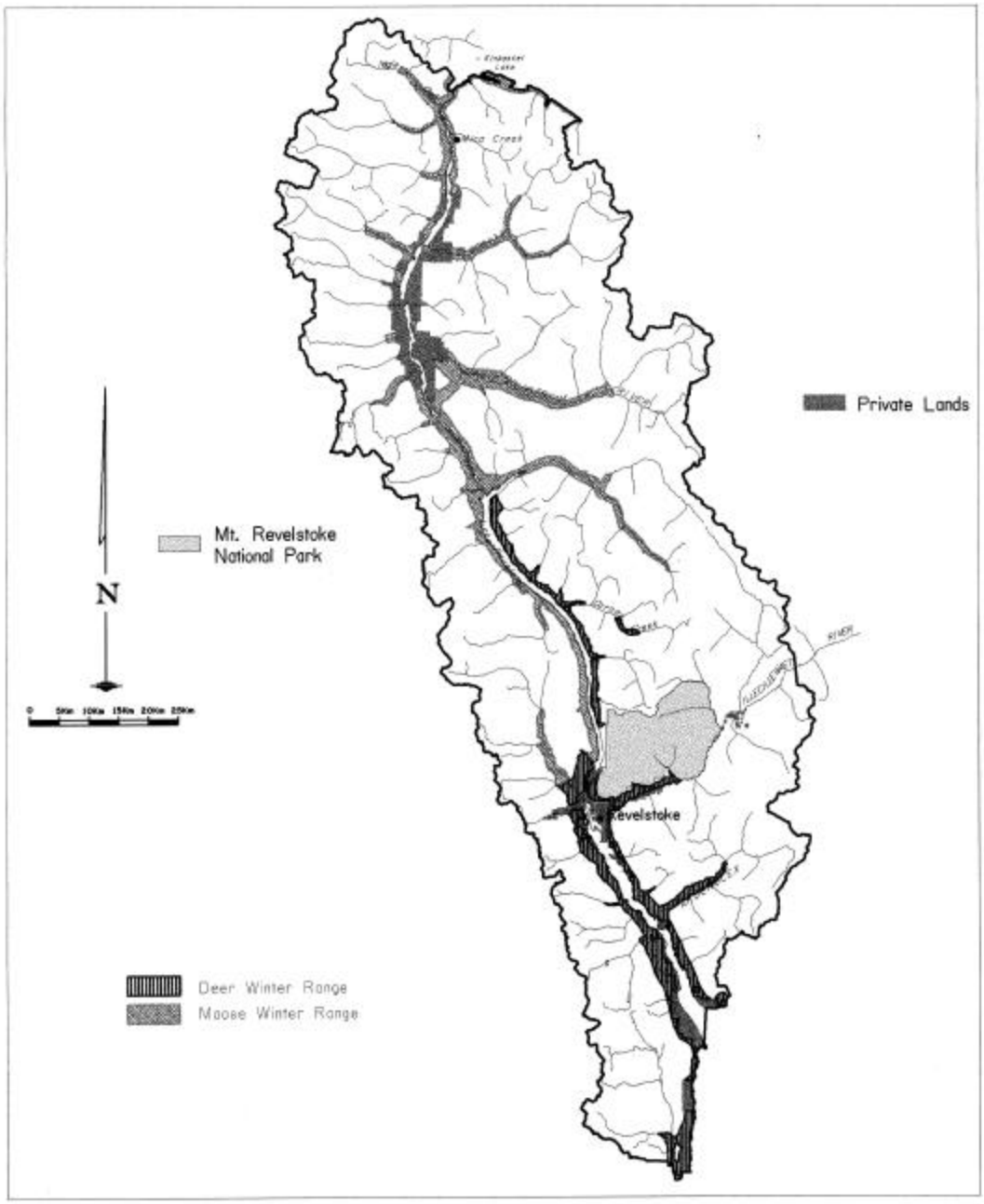
The process and general methodology for managing access within winter ranges, including strategies to be used to achieve the target road density, are summarized in the Access Management Guidelines (Section 3.10). However, specific direction for access management within ungulate winter ranges includes:

- Through the landscape unit planning process, a comprehensive, integrated access management plan, which addresses the complete spectrum of natural resources and resource user requirements on identified winter ranges must be developed.
- Development of permanent roads should be avoided in ungulate winter ranges.
- New roads should be permanently closed to conventional vehicular use on completion of forest harvesting, silviculture or other resource development activities.
- Motorized use of roads situated within winter ranges, should be seasonally scheduled , wherever possible, to minimize harassment and displacement of ungulates from preferred habitats during the winter months. This recognizes that some roads, required for human settlement purposes (including access to private resorts and private land) and industrial activities do require winter access, but will seek to meet the intent of the guideline.
- Use of existing main line forestry related road access, which traverses through winter range areas, will be maintained. However, if these roads are not required for use on a daily basis they should be subject to seasonal use scheduling.

B. 3.4.2 Ungulate Winter Range Location

These management guidelines apply to the mapped critical ungulate winter range depicted on Map 3. orre-inventoried versions. Where a particular geographic area provides habitat for more than one priority ungulate species, a “leading” ungulate species has been mapped at the 1:500,000 scale. (These maps are available for local level strategic and operational planning). Where this occurs, the intent is to apply the operational guidelines for the leading species for that geographic area. However, if necessary, more than one guideline set can be applied on a 250 ha. management unit.

Where ungulate winter range overlaps with critical caribou habitat or high or intermediate biodiversity emphasis, the management practices will meet all of the requirements.



Note: Where caribou habitat or biodiversity management guidelines also apply, management practices will meet all the requirements.

Map B3. Critical Ungulate Winter Range

B. 3.4.3 Operational Guidelines

Within the areas indicated on the ungulate winter range map, management regimes will vary according to B.E.C. sub-zone, variant and priority species as indicated in the following table.

Table 1: Forest Cover Guidelines

Species	Guide-line Set	Biogeoclimatic Ecosystem Classification	Minimum Amount of Mature Forest Cover Retention Over the Managed Forest Land Base	Habitat Management Objectives	Rationale/Comments
Mule deer	*1*	*ICHmw2 & 3 ICHvk1, ICHwk1*	*40% forest cover comprised of 120+ yr. old trees with a minimum crown closure of 60%. in units >20 ha. Every 250 ha. or suitable multiples up to planning cell scale*	*- Maintain snow interception, security cover and litterfall - Maintain mature forest cover in close proximity to early spring forage sites*	*Deep snow is often prevalent on these winter ranges. Dense mature stands with interlocking crowns provide the required attributes to facilitate foraging and movement opportunities. Fd preferred where present.*
Moose	*2*	*ICHvk1, ICHwk1, ICHmw2 & 3*	*In Revelstoke TSA, and TFL 23: 40% forest cover comprised of 120+ year old trees,* *In TFL 55 and TFL 56: 34% forest cover comprised of 100+ year old trees* *In all units retained forest cover must provide a minimum crown closure of 70% in units >20 ha. Every 500 ha. or suitable multiples up to planning cell scale or as otherwise acceptable to the MOE Forest Ecosystem Specialist*	*- Maintain snow interception, security cover, and connectivity - Maintain mature forest cover in close proximity to forage sites.*	*Deep snow is often prevalent in these subzones. Dense, mature stands with interlocking crowns provide the required attributes to facilitate foraging and movement opportunities*

Definitions

Forest Cover Distribution

- Spatial distribution of forest cover should be established in 250 hectare units for most species, and 500 hectare units for moose. To facilitate planning or analysis requirements, these units can amalgamated into multiples or nested within current interim planning cells, landscape units or watersheds.

Forest Cover Location

- The most suitable locations to maintain and connect forest cover, would be along distinct topographic breaks and on ridges or knolls. Mature forest cover components located in these areas can function in the capacity of security, thermal and snow interception cover and will also facilitate secure diurnal and seasonal ungulate movement requirements.

Optimum Cover

- The optimum dimensional characteristic of a patch of cover could range from 183 meters to 366 meters.

Optimum Forage Area

- For maximum use by ungulates forage areas should have no point in excess of 183 meters from the cover edge.

Mature and Old Growth Structural Characteristics

- As opposed to younger forests, the structural attributes associated with mature or old growth forest stands often contribute to a higher habitat suitability factor on ungulate winter ranges, especially where Douglas fir is present. The principle attribute contributions include; increased forage opportunities associated with needle and lichen litterfall (Fd needles have a higher inherent nutrient value than needles from immature trees), fewer numbers of stems per hectare and a predominately wide crown radius of individual trees. The latter attribute, particularly if the crowns interlock, accommodate ease of movement and enhance foraging opportunities beneath the forest canopy through enhanced snow interception capability.

  Lower age class surrogates may provide some of the preferred requirements, however, not having the same structural characteristics, that are associated with mature stands, they do not usually have the capacity to fulfill all the essential habitat elements to the same degree as mature forest cover stands.

Mature forest cover retention

- As stated in the forest cover guideline matrix, mature cover is the minimum percentage of mature forest habitat determined to be the most appropriate for a specific ungulate species by B.E.C. unit by distribution unit. The recommended forest cover percentages relate to 100% forest cover by area. The preferred species and desired characteristics are also expressed in Table 1 of these guidelines.

Preferred Forest Cover Species

- As expressed in the guideline matrix, Douglas fir is the species on which the emphasis of retention will be focused where this species is present. In relation to other species, Douglas fir has the most suitable inherent structural attributes which contribute to increased foraging opportunities, ungulate mobility high snow interception, thermal cover and security cover capability.

Forest Cover Components

Security cover

- Security cover is defined as vegetative habitat or topographic attributes which have the capability to enable ungulates to conceal themselves. Forest stand attributes which provide this cover characteristic should be at least 5ha. in size with a minimum stem height of 2 meters. Stem density is also an influential factor, however, the number of stems per ha. will vary in conjunction with ecosystem component designation and management objectives. On a site specific basis, cover provided by shrubs (height > 2m) may also be considered as security cover . Where required on steep slopes (>70%), greenup should exceed 3 meters in height to provide adequate security cover for ungulates.

Snow interception cover

- Snow interception cover is defined as tree crown attributes which have the capability to intercept snow. As this capacity will often vary in conjunction with the size, shape, stem density and species of tree, it is important to retain species which have the structural attributes which will have a distinct influence on snow interception capability. In this regard mature Douglas fir or dense intermediate age Douglas fir are preferred where this species is present. As snow interception often is the limiting factor for winter survival in areas with moderate to high snow accumulation, the selection and location of suitable structural characteristics is extremely important.

Thermal cover

- Thermal cover is defined as forest habitat which has the capability to assist ungulates in maintaining a constant body temperature. Stand attributes which have the potential to provide this cover characteristic are comprised of multi-layered stands, a height class of 2+, a crown closure class of 6+, are at least 20 ha. in size and have a minimum width of 400 m.

Connective cover

- Residual forest cover components should be interconnected through retention of corridors of mature forest (age class #5+) at least 200m. in width. This characteristic should occur in all landscape units to ensure suitable forest cover linkages are maintained within the identified winter ranges and between summer and winter use areas.

Special habitat protection cover

- Special habitat features such as identified mineral licks, wallows, calving grounds or exceptional foraging areas should have a designated forest management zone, which precludes permanent access, maintained around the perimeter of the site.

Forest harvesting

- In an effort to reduce physiological stress, at a time when over wintering ungulates are at their lowest energy level, forest harvesting activity should be concluded by mid winter.

B. 3.5 Mountain Caribou Management Guidelines

B. 3.5.1 Introduction

(a) Guideline Intent

To provide the amount and distribution of habitat required to maintain viable populations of the blue-listed mountain caribou in the Revelstoke herd.

To minimize displacement of mountain caribou resulting from development and recreational activities in critical habitat.

Within the context of the land use plan, mountain caribou are being used as an umbrella species, in that the application of the guidelines, in combination with the biodiversity emphasis option allocation (see Section 3.2) is intended to address the needs of old growth dependent species in those ecosystems, at least until further information about such species allows for more specific management direction to be developed. ***In this plan, mountain caribou habitat is also seen to contribute to the intermediate biodiversity emphasis objectives***.

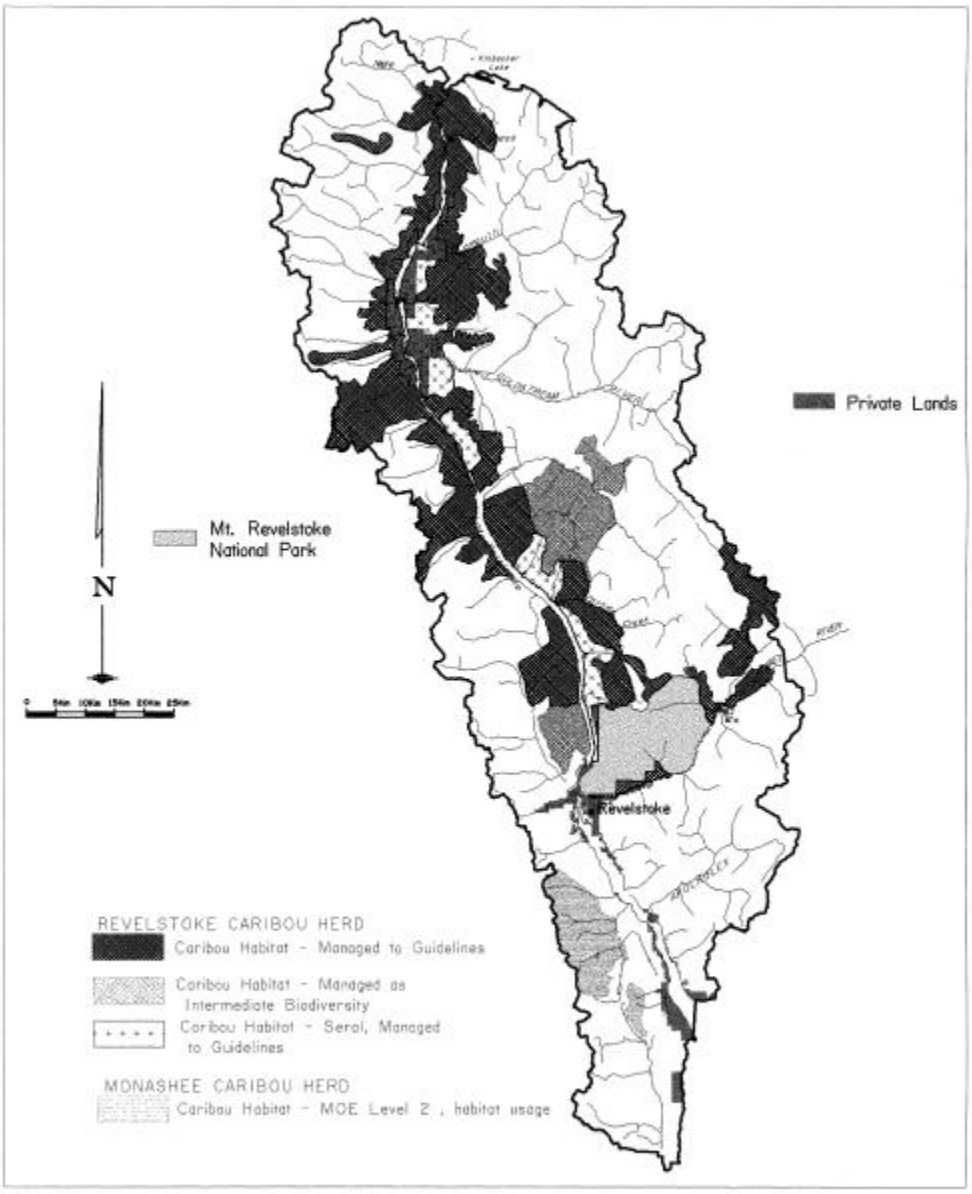
(b) General Management Approach

The above intent will be achieved by:

- designation of caribou habitat management areas which include a full range of seasonal habitats and movement areas between habitats. The management areas should be sufficient in size to maintain viable numbers of all populations.
- within caribou habitat management areas, ensure that a sufficient proportion of the land base is maintained in old growth forests on a continuous basis, from tree line down to the lowest elevations used by caribou.
- maintaining continuous, broad corridors of old growth and mature forest at regular intervals to connect larger pockets of old growth forest.
- managing access to and within caribou habitat management areas to minimize disturbance and illegal harvest (access management measures will be subject to review by local level strategic planning).

B. 3.5.2 Mountain Caribou Habitat Location

The mountain caribou management guidelines apply to the caribou habitat areas identified in Map B4. These areas represent known, critical caribou habitats based on radio telemetry data, aerial census data, terrain analysis and known sitings. Within the areas shown on Map 4, the operational guidelines respecting maintenance of forest cover vary by seasonal caribou habitat requirements.



Map B4. Mountain Caribou Habitat

B. 3.5.3 Operational Guidelines

(a) Forest Management

General

The following guidelines apply to the area designated for mountain caribou management in Revelstoke:

- ***Timber harvesting will be confined to the landbase outside upland parkland areas.***
- ***These guideline apply to the operable area of each landscape unit.***
- ***Only areas with slopes less than 80% are considered suitable caribou habitat which contribute to the habitat retention requirements.***
- ***Within the Interior Cedar-Hemlock (ICH) zone, a minimum of 40% of the landbase below the 1994 operability line will be in age classes 8 or older (>140 years), with 1/4 of this area having age class 9 (>250 years) forests.***
- ***Within the Engelmann Spruce – Subalpine Fir (ESSF) zone two options exist:***

  1. ***A minimum of 30% of the landbase below the 1994 operability line must have forests in age classes 8 or older (>140 years), with at least 1/3 of this area having age class 9 (>250 years) forests. On an additional 20% of the landbase below the 1994 operability line, partial cutting is acceptable so long as the removal of timber will not exceed 35% total, with green-up defined as age class 7 or greater (>120 years)***
  2. ***A minimum of 40% of the landbase below the 1994 operability line must have forests in age classes 8 or older (>140 years), with at least 1/4 of this area having age class 9 (>250 years) forests***

  In both options balsam leading and older forests will be preferred for retention.

- ***Timber harvesting guidelines need to be developed for the ESSF area between the 1994 operability line and the ESSF parkland. In the interim, 70% of the productive area between the 1994 operability line and the upland (ESSF) parkland zone must have forests in age class 8 or older (>140 years), retained on areas with slopes less than 80%.***

Ongoing discussions within the scientific community and within the context of the emerging Provincial Caribou Strategy will result in refinement to these guidelines.

The following objectives and strategies are intended to provide guidance to forest management operations -they are not required practices.

Stand-level management objectives and silvicultural strategies for winter habitat **

Habitat management objective	**Applicable season/zone[1]** EW-ICH	EW-ESSF	LW-ESSF	**Rationale/comments**	**Suggested silvicultural objectives**	**Silvicultural strategy**
windfirm habitat	·	•	•	• natural sporadic blowdown is a source of forage, but the stand as a whole should be windfirm	•windfirm stand	• maximum volume removal approximately 30% (excluding roads and landings)
contiguous future habitat	•	•	•	• maintain habitat contiguity in space and time; minimize susceptibility to catastrophes	•basically healthy stand	• 1. careful logging including: • direction falling • placing bunches to minimize bole and branch damage • skidding to minimize bole damage • 2. post-harvest sanitation cutting if necessary
maintain preharvest species composition	•	•	•	• caribou prefer B and BS forest types to S and SB	• maintain pre-harvest species composition and size class distribution	• marked to cut to retain specified mixture of species
abundant aboreal forage lichens available on standing trees	•	•	•	• adequate forage abundance is necessary to maintain use by caribou • snag retention may be necessary if a high proportion of lichen biomass is on snags • lichen abundance is low on trees with few branches or dense, tangled branches; dense branches hinder access to lichen (<50% of lower tree branches covered)	• significant component of trees = Class 3, including some of Classes 4 and 5 • moderate branchiness below 4.5m • a range of diameter classes retained	• maximum volume removal approximately 30% (excluding roads and landings) • spread volume removal over appropriate classes • to retain snags use feller-buncher and grapple skidders (WCB variance is necessary)

1. EW = Early Winter, LW = Late Winter, ICH = Interior Cedar Hemlock, ESSF= Engelmann Spruce – Subalpine Fir

Habitat management objective	Applicable season/zone[1] EW-ICH	EW-ESSF	LW-ESSF	Rationale/comments	Suggested silvicultural objectives	Silvicultural strategy
Abundant arboreal forage lichens available as litterfall	•	•		• adequate forage abundance is necessary to maintain use by caribou • lichen-bearing snags produce litterfall as the branches break and bark sloughs off	• significant component of mature, lichen-bearing trees • a component of declining trees/snags (Wildlife Tree Classes 2-4)	• maximum volume removal approximately 30% (excluding roads and landings) • spread volume removal over appropriate classes • to retain snags use feller-buncher and grapple skidders (WCB variance is necessary)
Snow interception	•	•		• fresh soft snow covers ground forage and litterfall, and makes movement difficult	• manage for snow interception in all or part of stand • high canopy closure • dense, wide, long crowns • multilayered structure	• low volume removal • group selection better than single tree selection • unlogged reserves may be left within stand
Maintain low evergreen shrubs where they occur; avoid enhancing forage for moose and deer	•	•		• low evergreen shrubs important before snow is deep, especially in the ICH • enhancing habitat for moose and deer may increase wolf and cougar populations or attract them to caribou ranges	• minimize disturbance of soil and vegetation	• keep harvesting or site preparation activities that disturb the forest floor to an absolute minimum (e.g., winter log on snowpack, spot scarify, or plant without scarifying)
minimize visual obstructions	•	•	•	• caribou seem to prefer areas where they can see around them; there is evidence that they avoid areas where tall shrubs, conifer regeneration, or obstructions restrict visibility • applies also to stands used by caribou during snow-free seasons	• regeneration density control to lower limits of silvicultural acceptability - see silvicultural standards as per FPC.	• regeneration may be widely dispersed, as in single tree selection for uneven-aged management under low q values (<1.5); or • regeneration may be concentrated into patches providing visibility is good in adjacent areas
maintain stand level connectivity	•	•	•	• caribou seems to prefer areas where movement is not obstructed by debris or vegetation • applies also to stands used by caribou during snow-free seasons	• avoid excessive physical obstructions (e.g., windthrown slash, many down trees)	• thorough slashing of logging debris, especially if in large quantity.

Interim prescriptions for selection silvicultural systems in mountain caribou habitat with reference to effective pre-harvest stand structure		
Effective Pre-harvest Stand Structure	**Single Tree Selection System**	**Group Selection System**
Single-storied Stand Structure	Conversion to multi-stories stand structure requires several light stand entries. Maintain at least 75% of initial basal area per cut. Protect and maintain high-rated lichen-bearing trees. Mineral soil exposure needed to promote natural spruce regeneration. Moderate (40+ year) cutting cycle.	The following applies to all partial cutting using group selection in caribou habitat (exceptions are noted): • each stand entry should remove no more than 30% of the stand by volume or area, including skid trails. • small opening sizes (<0.5 ha) are probably best for caribou habitat and stand windfirmness. • if protection of advance regeneration within openings is desired then winter logging on snowpack will help. • mineral soil exposure or microsite planting may facilitate regeneration of desired species. • group selection must be used if snag retention using feller-buncher harvesting is a stand management objective. • long cutting cycles (75+ years) are necessary for long term lichen biomass retention. • for stands with irregular structure an extended cutting cycle will be necessary if basal area is very low initially.
Two-storied Stand Structure	One or more moderate stand entries to release thrifty C2 (pole-sized intermediate trees), stimulate seed production in overstory, and promote understory regeneration. Maintain about 66% of initial basal area and B-level stocking. Protect high-rated lichen-bearing trees. Protect pole-sized trees during felling and skidding. Long (75+ year) cutting cycle.	
Multi-storied Stand Structure	Stand entries must maintain and enhance existing structure, species composition, quality, and stocking. Retention of about 66% of initial basal area is acceptable depending on the wind exposure of the stand. Maintain at least 20 m^2/ha (approx.) of basal area per entry. Protect and maintain high-rated lichen trees.	
Irregular Stand Structure	At least one stand entry needed, possible as an improvement cut, to promote the desire multi-storied stand structure and allow basal area stocking to increase over time to acceptable minimum levels (20 m^2/ha approx.) or more. An extended cutting cycle will be necessary to allow basal area stocking to recover.	

(b) Access Management

Animal predators and access for snowmobiling have a negative affect on caribou in the Revelstoke area.

The process and general methodology for managing access within critical caribou habitat, including strategies to be used to set and achieve target road density, are summarized in the Access Management Guidelines (Section 3.10). However, specific direction for access management within and around critical caribou habitat includes:

- ***an emphasis on zoning for recreational activity to restrict snowmobiling to areas outside of late winter range habitat (*see *Resource Management Projects Chapter D Section 3.3)***
- ***avoid road access in the upland parkland areas wherever possible.***

It is recognized that new roads built for the exclusive purpose of minerals, coal or oil and gas exploration and development, or for human settlement to access private property or Land Act tenures, are relatively few. In areas of concern within caribou habitat, new mineral/energy/ settlement road construction will be subject to an enhanced referral (see *Access Management Guidelines Section 3.10.3*) to identify specific operating conditions. In the rare cases where road density is at or near limits, access in the short term will be closely monitored and managed (with possible gated or other closures) and densities may be temporarily exceeded. The permitting government agency must promptly notify the Ministry of Forest sDistrict Manager of the development application in cases where longer-term access is required. Operational planning will be initiated to determine how the targeted road density can be achieved. The siting and timing of construction and use for such roads will be subject to review within the context of these guidelines.

B. 3.6 Watershed Management

B. 3.6.1 Introduction

(a) Guideline Intent

To provide a clear definition of "community watersheds" and "domestic watersheds". To acknowledge that community watersheds will be managed as per the Forest Practices Code Community Watershed Guidebook. To provide management guidance for forest and mineral exploration activities in domestic watersheds.

The intent of this guideline is to be consistent with provincial policy on the management for domestic watersheds. As this policy is currently just emerging, these guidelines will be reviewed at the time the policy is finalized to ensure consistency.

(b) Definitions

General

The intent of the community watershed definition is to capture watersheds which serve as important water supplies for legally organized user groups such as municipalities, regional district areas, improvement districts, utilities and water users' communities. These user groups generally utilize water systems which are built to higher standards and service many properties.

The intent of the domestic watershed definition is to capture watersheds which support domestic licensing but where the water users have not incorporated themselves and frequently utilize individual water systems.

Community watersheds are defined in the *Forest Practices Code of British Columbia Act* as follows:

41 (8) For the purposes of subsection (6) "community watershed" means

(a) the drainage area above the downstream point of diversion on a stream for a water use that is for human consumption and that is licensed under the *Water Act* for

(i) a waterworks purpose, or

(ii) a domestic purpose if the license is held by or is subject to the control of a water users' community incorporated under the *Water Act*

if the drainage area is not more than 500 km2 and the water license was issued before June 15, 1995, or

(b) an area that is designated as a community watershed under subsection (10).

41 (9) In subsection (8) "domestic purpose" and ":waterworks purpose" have the meaning given to them in the *Water Act*.

41 (10) The regional manager of the Ministry of Forests may designate an area as a community watershed if
(a) in the opinion of the regional manager and a designated environmental official (regional water manager) it should be designated as a community watershed,
(b) the area is all or part of the drainage area above the downstream point of diversion for a water use that is for human consumption and that is licensed under the *Water Act* for domestic or a waterworks purpose, and
(c) the area is not referred to in subsection (8((a).

41 (11) With the agreement of the designated environment official, the regional manager may by written order vary or cancel an area's status as a community watershed whether the area is defined to be a community watershed under subsection 8(a) or designated to be a community watershed under subsection 10.

A **Domestic Watershed** is defined as the drainage area above the downstream point of diversion on a stream which is:
(a) licensed under the *Water Act* for human consumption;
(b) not classified as a community watershed under the *Forest Practices Code of British Columbia Act;*
(c) usually not more than 200 km^2 in drainage area.

Note: The area above the downstream point of diversion may include a significant proportion of private land which is not within the jurisdiction of the Forest Practices Code. It should be understood that the domestic watershed guidelines apply to the Crown land portion of the watershed although private land owners are encouraged to adopt these practices as well.

(c) General Management Approach

Forest development activities in **Community watersheds** will be managed according to the Forest Practices Code *Community Watershed Guidebook.*

Mineral exploration and mine development activities in **Community watersheds** will be managed according to the *Mineral Exploration Code*, the *Mines Act*, and standard project review and approval processes (i.e., inter-agency referrals, the Mine Development Review Committee process, or the Environmental Assessment Office process).

Domestic watersheds: These guidelines define a level of management for forest activities on Crown land in domestic watersheds which lies between standard Forest Practices Code and management in community watersheds. It does this by providing:

a) a classification and mapping system for domestic watersheds;
b) a basic assessment of hazard related to forest activity;
c) a set of recommended forest practices;
d) a strengthened opportunity for public input to the forest development plan;

e) a contingency plan in case of damage to water supply.

The guidelines also suggest management practices for mineral exploration activities in domestic watersheds. They are intended to guide the application of the *Mineral Exploration Code* which has provisions for exploration near domestic water intakes.

Proposals for small mine developments in domestic watersheds will be subject to standard project review and approval processes (i.e., inter-agency referrals and the Mine Development Review Committee (MDRC) process). The MDRC review process has opportunities for public consultation.

Large mine developments and related activities are reviewed through a process coordianted by the Environmental Assessment Office, and subject to the *Environmental Assessment Act*. This process involves detailed socio-economic and environmental assessment of the project and considerable opportunity for public consultation.

For forest activities, the responsibility to implement the Domestic Watershed Guidelines rests with:

a) Environment and Lands, to develop and maintain the classification and mapping system and to provide advice during the forest development plan process on high risk/consequence areas on a priority basis;
b) the forest activity proponent to complete the assessment, modify the forest development plan (FDP) to address hazards, incorporate appropriate forest practices, notify water users of the opportunity for involvement, address water users concerns during the FDP process, and in general, to ensure that activities are conducted in such a manner that water quality, quantity and timing of flow will be maintained;
c) Ministry of Forests to review, recommend modifications and approve the forest development plan if it complies with the Forest Practices Code and the objective of maintaining water quality, quantity and timing of flow in domestic watersheds;
d) water users to attend FDP presentations, review impact assessments and plans, propose constructive technical improvements to meet stated objectives, notify agencies if problems are identified so that corrective action can be taken; to construct and maintain water works that are capable of handling natural water quality and flow levels;
e) all parties during emergencies requiring contingency plan implementation.

For mineral exploration activities, the responsibility to implement the Domestic Watershed Guidelines rests with:

a) Environment and Lands, to develop and maintain the classification and mapping system and to provide advice on high risk/consequence areas on a priority basis;

b) the mineral exploration proponent to complete a satisfactory Mines Act permit application, to address hazards, incorporate appropriate exploration practices, notify water users of the proposed mineral exploration works, and in general, to ensure that activities are conducted in such a manner that water quality, quantity and timing of flow will be maintained;
c) Ministry of Energy and Mines to review, recommend modifications and approve the Mines Act permit applications if it complies with the Mineral Exploration Code and the Mines Act, and is consistent with the objective of maintaining water quality, quantity and timing of flow in domestic watersheds;
d) water users may attend pre-approval on-site inspections if required; propose constructive technical improvements to meet stated objectives; notify agencies if problems are identified so that corrective action can be taken; to construct and maintain water works that are capable of handling natural sediment and flow levels;
e) all parties to cooperate during emergencies requiring remedial or reclamation works.

The Kootenay-Boundary region is the first area in British Columbia to implement a comprehensive forest management strategy in domestic watersheds. Soon after the implementation phase is complete, it will be necessary to begin reviewing on-the-ground applications of the guidebook to address weaknesses and strengthen overall effectiveness.

B. 3.6.2 Watershed Locations

Designated community watersheds in the Revelstoke area include the Greely, Bridge, Hamilton and Dolan watersheds. Most of Bridge and Hamilton Creeks are within Mt. Revelstoke National Park.

Domestic watersheds have not been mapped. The majority of domestic licenses are on tributaries to the Illecillewaet River, Napoleon, Goch, Hayes, Locks, Thomas Brook, South Griffith and ZZ creeks.

B. 3.6.3 Operational Guidelines

(a) Community Watersheds

The Forest Practices Code Community Watershed Guidebook will apply to forest development activities within all designated community watersheds, where such activities are permitted.

The *Mineral Exploration Code* will apply to mineral exploration and development activities in all designated community watersheds, where such activities are permitted.

(b) Domestic Watersheds

Classification of Watersheds

Domestic watersheds will be classified into three categories as follows:

Class 1 Watersheds
These watersheds are associated with springs and very small creeks which do not have clearly defined drainage or catchment areas. Often these small water sources are located on "face units" (populated areas between major streams). Face units may encompass many small streams and springs which support domestic licensing. Face units will often be mapped as one area because of the difficulty of defining these micro drainage areas without on-the-ground investigation. There may also be streams within the mapped face unit which are not licensed for domestic use. It will be important for the forest/mineral proponent to identify these early in the process so that unnecessary assessments and notification of water users can be avoided.

Class 2 Watersheds
These are small watersheds having drainage areas which are; definable on existing topographic mapping and, less than 500 ha (5 km^2).

Class 3 Watersheds
These are watersheds with a drainage area of 500 ha (5 km^2) to 200,000 ha (200 km^2). To aide in the assessment procedure in these larger watersheds, it may be necessary for MELP to delineate sub-drainages as part of the mapping exercise. Sub-drainages will be established using the methodology given in the Interior Watershed Assessment Procedure (IWAP) guidebook.

Mapping
Class 1, 2 and 3 domestic watersheds (and sub-drainages where applicable) will be mapped by Environment and Lands onto a 1:20000 base. This mapping will also show community watersheds. Since water licensing is not static, this mapping will be updated periodically and distributed to Ministry of Forests district offices. For information on the status of water licensing on streams contact the Water Management Program.

Assessment and Detailed Mapping for Forest Activities in Domestic Watersheds
When forest activities are proposed within known domestic watersheds, an assessment procedure will be completed by the proponent and submitted with the forest development plan (FDP). The objective of the assessment will be to ensure that the proposed forest activities do not pose an unacceptable risk to water quality, and the quantity and timing of flow at the point of intake.

As noted under the definition of a domestic watershed, the mapped watershed area often contains private land. <u>The following procedures are to be applied to the crown land portion of the watershed</u>. These procedures should not be used to assess the impacts of rural land development. However, private land holders are encouraged to follow these procedures and practices when logging private land.

The assessment procedure prescribed for larger watersheds is similar in part to the procedures described in the Interior Watershed Assessment Procedure (IWAP) Guidebook and an understanding of IWAP is essential to an understanding of this section.

The proponent may request relief from the requirement for an assessment by illustrating to the MOF district manager that the proposed activity creates an insignificant impact to the watershed (i.e. large watershed with a very small amount of proposed activity). The district manager will consult Water Management staff as appropriate.

Class 1 Watersheds

Areas defined as class 1 watersheds on the mapping will undergo a detailed procedure as systems described in the box below. The main objective is to maintain the integrity of recharge areas and channel.

1. Obtain the highest quality topographic map of the area that is available (this will usually be the 1:20,000 TRIM map), the largest scale air photograph pairs available, MELP map referred to in section 3, the MELP map of water intake locations and the MELP water license listing of the area in question.
2. Transfer the locations of the water intakes on the MELP water intake location map to a large scale topographic map (e.g.1:20,000 TRIM map).
3. Confirm intake locations (by field work if necessary) and transfer to the topographic maps. If the stream courses are mapped inaccurately, indicate the correct locations on the topographic maps. In order to find the intakes, it may be necessary to interview the water licensees. It may be necessary to go on private land and appropriate permission should be obtained for doing so. The air photographs will be useful for field checking.
4. Map the streams above the water intakes on the topographic map by walking upstream of the intake. It may be possible to quickly affirm that the TRIM map is correct. If it is not correct, use compass and chain methods or GPS units to enable transfer of actual stream locations onto the topographic maps. It should be noted that many first order streams disappear and reappear as one moves upslope and a thorough search should be made of all field evidence of seepage zones and streamflow above the first disappearance of the streams. Indicate on the map where an actual channel exists (solid line) and where you infer flow (dashed line). Indicate evidence of flowing water and seepage separately. Mapping should be done during periods of high flow (e.g. shortly after snowmelt) when flow pathways are most evident.
5. Use the topographic map to outline the inferred drainage area contributing to each water source.
6. Use this map to plan the location of roads and logging activity. Roads have the potential to divert water away from areas used for water supply. Harvesting activities must be planned such that the flow remains in the natural channels. Small changes in drainage patterns can affect downslope water supplies.
7. Avoid locating roads within 50m of the water intake. If the road is constructed through a seepage area, it should be constructed in such a manner that slope seepage is maintained in its present location. Specialized road construction techniques such as a permeable road prism or use of geotextile fabrics may be necessary in selected seepage zones to maintain the natural subsurface flow patterns.
8. When the road is surveyed in the field, crossings of each water source should be clearly ribboned with the name of the source and “domestic water supply” written on the ribbon. The locations of the crossings are to be pointed out to those doing the road construction.
9. When the road is constructed, signs are to be placed at each water supply stream crossing which name the source and “domestic water supply”.

10. Road construction should be carried out in a manner which minimizes impacts to water quality.
11. The road should be designed in such a manner that road surface and ditch drainage does not directly enter a water supply stream. High quality surfacing material should be used immediately adjacent to stream crossings.
12. All personnel doing activity in the area should be informed that they are operating in a water supply area and that all their activities including personal hygiene should respect the maintenance of the downstream water supply.
13. In general roads in this class of watersheds should remain open only as long as they are required. When road use is complete they should be rehabilitated with special attention given to maintaining natural drainage patterns.

Class 2 Watersheds

Areas defined as class 2 watersheds on the mapping will undergo a detailed procedure as described in the box below. The objective is to confirm channel and intake locations and to plan upstream activities such that new sediment sources are not created.

The procedure for class 2 watersheds requires less field work because these watersheds are topographically defined. A watershed report card (see Class 3 Watersheds) is required. Since results from the report card become less dependable with smaller watersheds, the report card should not be used by itself to define hazards in watersheds under 5 km^2(500 ha).

1. Obtain the highest quality topographic map of the area that is available(this will usually be the 1:20,000 TRIM map), the largest scale air photograph pairs available, the MELP watershed classification map, the MELP map of water intake locations and the MELP water license information for the streams in question.
2. Transfer the locations of the water intakes on the MELP water rights map to a large scale topographic map (e.g. 1:20,000 TRIM map).
3. Walk stream courses above water intakes. It may be possible to quickly affirm that the TRIM map is correct and further ground verification is not necessary. When mapping does not appear to be correct, use compass and chain methods or GPS units to enable transfer of stream locations onto topographic maps.
4. Use the topographic map to estimate the drainage area.
5. Overlay available terrain information to plan the location of roads and logging activity.
6. Avoid locating roads within 50 m of any water intake or on unstable terrain.
7. When the road is surveyed in the field, crossings of each water source should be clearly ribboned with the name the source and “domestic water supply” written on the ribbon. The locations of the crossings are to be pointed out to those doing the road construction.
8. When the road is constructed, signs are to be placed at each water supply stream crossing which name the source and state “domestic water supply”.
9. Road construction should be carried out in a manner which minimizes impacts to water quality.
10. The road should be designed in such a manner that road surface and ditch drainage does not directly enter a water supply stream. High quality surfacing material should be used immediately adjacent to stream crossings.
11. All personnel doing activity in the area should be informed that they are operating in a water supply area and that all their activities including personal hygiene should respect the maintenance of the downstream water supply.

12. In general roads in this class of watersheds should remain open only as long as they are required. When road use is complete they should be rehabilitated with special attention given to maintaining natural drainage patterns.

Class 3 Watersheds

Areas defined as class 3 on the mapping will undergo an assessment utilizing a domestic watershed report card. This is a reconnaissance level analysis intended to identify several broad categories of risk from past or planned forest harvesting. When high hazard levels are indicated, it is expected that these will be addressed in the forest development plan.

The domestic watershed report card is comprised of several key indicators which were developed for the Interior Watershed Assessment Procedure (IWAP). Larger class 3 watersheds may have sub-drainages delineated on the mapping. The report card indicators are to be generated for each sub-drainage.

IWAP is a very new procedure and will not be fully calibrated until many applications can be ground-truthed and analyzed. For example, current applications are experiencing numerous problems with “false highs”. This occurs when high hazard scores are registered on the report card but are not confirmed by field investigation. Studies are currently underway to calibrate the reconnaissance level hazard ratings with actual on-the-ground hazards. The hazard table below will change to reflect any future calibration of ratings.

Forest activity proponents are required to submit a domestic watershed report card. This report card is based on the watershed report card on page 18 of the IWAP guidebook but is limited to:

a) peak flow index (including the equivalent clearcut area [ECA] calculation)
b) road density for entire sub-basin (km/km^2)
c) no. of stream crossings (no./km^2)
d) no. of landslides (no./km^2)
e) roads on unstable slopes (km/km^2)

These 5 indicators will be calculated by the methodology described in the IWAP guidebook and should be recorded in the following format:

Form 1. Watershed report card

Impact Indicators	Sub-basin name							
a) peak flow index (also record ECA % in this space)								
b) road density for entire sub-basin (km/km^2)								
c) # of stream crossings (no./km^2)								
d) # landslides visible on 1:20000 photos(no./km^2)								
e) roads on unstable slopes (km/km^2)*								

* Class IV and V terrain where terrain mapping is available or otherwise on slopes greater than 60%.

Hazard ratings will be determined by the following Hazard Index table:

Note: Hazard index ratings for IWAP's are presently under provincial review.

Impact Indicators	Hazard rating		
	low	medium	high
a) peak flow index	<0.3	0.3-0.42	>0.42
b) road density for entire sub-basin (km/km^2)	<1.5	1.5-2.1	>2.1
c) no. of stream crossings (no./km^2)	<0.4	0.4-0.6	>0.6
d) no. of landslides (no./km^2)	<0.1	0.1-0.18	>0.18
e) roads on unstable slopes (km/km^2)	<0.15	0.15-0.25	>0.25

NOTE: Hazard ratings which are derived from this table may not reflect true conditions in the watershed. Therefore it is important that hazard scores be used only as a course filter to help identify potential problem areas and/or to aide in the prioritization of watersheds for application of a full IWAP. When scores are tending to the high end of the scale, the FDP should state how the possible hazard will be addressed.

The following is an illustration of how the hazard rating might be used:

- If indicator "a)" is high - discuss further assessment (i.e. channel assessment) needs with agency specialists and <u>or</u> consider alternate harvest schedules or areas;
- If indicators "b)" to "e)" are high - confirm indicator with field review, discuss assessments with agency specialists, consider reducing new road development and/or a road reclamation strategy.

Assessment and Detailed Mapping for Mineral Exploration Activities in Domestic Watersheds

Impacts of mineral exploration and related activities are more localized than do forest development activities, therefore, the same general assessment and mapping procedure can be used in all three classes of domestic watershed.

The proponent may request relief from the requirement for an assessment by illustrating to the MEM District Inspector that the proposed activity creates an insignificant impact to the watershed (i.e. large watershed with a very small amount of proposed activity). The District Inspector will consult Water Management staff as appropriate.

When activities which require a Mines Act permit (mechanized soil disturbance) are proposed within a domestic watershed, the District Inspector may require all or some of the following based on; the proposed amount of disturbance, the sensitivity of the area and the proximity of the disturbance to water intakes:

1) Obtain a 1:20,000 TRIM map (or better quality map if available) of the area, the largest scale air photo pairs available, the MELP map of water intake locations and the a list of water licensing for the area from MELP. (Contact the Ministry of Energy and Mines for copies of relevant maps or information on how they may be obtained.)

2) Transfer the locations of the water intakes on the MELP water rights map to a large scale topographic map (i.e. the 1:20,000 TRIM map). Provide a description of the intakes with accompanying photographs.

3) Map the courses of the streams above the water intakes on the topographic map by walking upstream from the intake to the area of proposed activity. It may be possible to quickly affirm that the TRIM map is correct and further ground verification is not necessary. If it is not correct, use compass and chain methods or a GPS to enable transfer of true stream locations onto the topographic map. Generally, inaccuracies in TRIM stream locations, occur more on small streams that are poorly defined by contours.

4) A reconnaissance level terrain stability assessment and detailed surface soil erosion assessment and mapping may be required by the District Inspector in particularly sensitive areas.

5) Use the map with an overlay of the terrain map (if a terrain stability assessment has been required) to plan the trail building and other mining or exploration activities. All proposed works are to be noted on the map.

Riparian Management

For forest activities, riparian management in domestic watersheds will be determined by the Riparian Management Guidebook with one important exception. Streams licensed for domestic use which are classified as S5 or S6 under the guidebook, will be managed as S4

streams for a distance of 500m above the most upstream domestic intake. S4 management (see page 50 of the guidebook) is designed to maintain water quality, stream channel processes and stream temperatures.

This riparian management will be applied to all water sources which support domestic licensing regardless of whether they are defined as streams under the FPC.

For mineral exploration activities, riparian management provisions will follow the Mineral Exploration Code. Except for stream crossings and pump locations, works shall not occur within 5 metres of the wetted perimeter of a stream. In cases where the 5 metre buffer does not afford adequate protection for water quality, the District Inspector may employ additional best management practices adjacent to the reserve. The extent of the management area and the type of practices employed will be determined by the proposed level of disturbance, proximity to the stream and the sensitivity of the site.

Forest Practices in Domestic Watersheds

Terrain Hazards

- A person should not propose harvesting of an area in a domestic watershed if the area is subject to a high likelihood of landslides following timber harvesting.
- Reconnaissance level terrain mapping is normally required in domestic watersheds.

Roads

- A road in a domestic watershed should not be located within a 50 m radius upslope of a water intake.
- Roads should be constructed so as to minimize disruption of surface and subsurface flow pathways particularly in spring recharge areas.
- A person who constructs, modifies or deactivates a road in a domestic watershed should; (a) notify water licensees or their representatives of the start date of road construction, modification or deactivation at least 48 hours before the start of road construction, modification or deactivation if it is anticipated that sediment could reach a water intake; (b) ensure that rock containing significant amounts of sulphide minerals, and which may have potential for generation of acid, is not used for road construction or modification.

Harvest Levels

Harvest levels are determined by calculation of the equivalent clearcut area (ECA) as is necessary for the watershed report card. This is done for the watershed as a whole and for major sub-drainages within the watershed as shown on the MELP watershed mapping. The concentration of harvesting on smaller areas should also be considered.

ECA's in sub-basins

- The maximum ECA in any basin larger than 250 ha, that has not been individually considered in the report card, should not exceed 30 % of the area. If it has been considered individually, the report card will apply.

ECA's above sensitive sites

- When cutblocks are proposed on areas which drain onto class IV or V terrain (or slopes over 60% if terrain mapping not available), the ECA should be limited to 20 % of the area draining onto the sensitive site.

Range

Range management provisions within the Forest Practices Code recognize domestic water use. Range Use Plans (RUP's) are mandatory and must indicate known domestic intakes and actions taken to accommodate this resource use. The FPC requires that the RUP indicate levels of use, strategies for wetlands and riparian areas and other provisions.

Domestic water users can review RUP's and provide comment. The MOF district manager approves RUP's and can require amendments if special circumstances warrant. In addition, the district manager can require security for the performance of obligations under a RUP.

If problems or special circumstances arise with respect to range use in a domestic watershed, the initial preferred approach is for the water user to deal with the MOF district manager. In cases where it is suspected that a water supply has been contaminated, the district manager should promptly notify and consult with staff in MELP, Ministry of Health and Ministry of Agriculture, Fisheries and Food in order to locate the appropriate expertise to confirm and respond to the problem. Occasionally, an inter-agency team may be required to resolve contentious situations.

Timber Harvesting

- A person carrying out a timber harvesting operation on applicableland within a domestic watershed should not, except to provide access to, or to maintain, a water supply intake, cut or damage a tree that is closer than 50m upslope of a water supply intake and must protect known water supply intakes and infrastructures.

Silviculture

- The use of livestock to carry out site preparation or brush control within a riparian management area, must be guided by a suitable management or animal control plan which addresses maintenance of water quality.
- The use of pesticides will be managed similarly to the Pesticide Management section of the Community Watershed Guidebook (see page 101). Under this strategy, pesticide applicants would be required to develop an Integrated Pest Management program prior to receiving a permit. IPM programs consider non-toxic alternative treatments, long term prevention of pest problems and would provide opportunities for public input in contentious areas.
- A 10m fertilizer-free zone should be maintained around any flowing stream that is observable from the air. See the Fertilizer Management section of the Community Watershed Guidebook for a description of how to ensure this zone is maintained.

Fertilizer application close to streams is sometimes beneficial to water quality (e.g. hydro-seeding of road banks at stream crossings).

- Fertilizer should not be applied within 50m upslope of a water intake.
- Fertilizer should be applied during cool and moist conditions (not during the summer).

Recreation

- The construction of recreation facilities within riparian management areas should be avoided whenever possible.
- In general, activities such as motorized recreation and camping should not be encouraged in smaller domestic watersheds (< 10 km^2).

Mineral Exploration Activities in Domestic Watersheds

- Avoid locating roads, drill sites, trenches or other works within 50 metres radius upslope of a water intake or on unstable ground, unless authorized by the District Inspector.
- Exploration drilling and the establishment of pump intakes in domestic watersheds should not be located within 50 metres radius upslope of a water intake.
- Roads, drill sites, trenches or other works should not interfere with any known subsurface flow paths of a drainage area that contributes to a spring.
- When a road location is surveyed in the field, the location of the crossings of each water source stream should be clearly ribboned with the name of the source and "domestic water supply" written on the flagging. The locations of the crossings are to be pointed out to those doing the construction.
- When the roads are constructed, signs are to be placed at each water supply stream crossing which name the stream and indicate "domestic water supply".
- Trail, drill pad, trenching and other works should be carried out in such a manner that adverse impacts on water quality are minimized. For instance, sumps shall be utilized to contain drill cuttings and mud. Drilling muds and fluid additives shall be of a non-toxic and non-hazardous nature.
- Works should be designed and constructed in such a manner that surface drainage is prevented from directly entering a water supply stream. Where possible, works should be designed and constructed such that water drains away from the stream. Specialized construction practices, operating practices and materials (such as filter fabrics, high quality surfacing materials etc.) may be required to be utilized. For instance impervious drill sumps with drilling fluid recirculation may be required in select instances.
- All personnel working on the project must be informed that they are operating in a water supply area and that all activities including personal hygiene must respect the maintenance of the downstream water supply.
- In general works shall be reclaimed as soon as practicable, when they are no longer required.
- A person who constructs, modifies or reclaims a road or exploration trail in a domestic watershed should; (a) notify water licensees or their representatives of the start date of road construction, modification or reclamation at least 48 hours before the start of road construction, modification or reclamation if it is anticipated that sediment could reach a water intake; (b) ensure that rock containing significant amounts of sulphide minerals, and which may have potential for generation of acid, is not used for road construction or modification.

- The District Inspector may require drill holes that make water to be sealed with cement.
- Trenches should be located or oriented to minimize inflows of surface water.

If trenches intercept the water table or groundwater flows, work should not continue until it can be determined that domestic water supplies will not likely be adversely affected and the District Inspector has approved a mitigative strategy.

B. 3.6.4 Planning Framework and Public Input for Domestic Watersheds

For forest activities, the following chart summarizes the first stage of planning in domestic watersheds.

	Class 1	Class 2	Class 3
Watershed type	Springs and very small streams	Small streams with defined drainage area <500 ha.	Larger streams with defined drainage area >500 ha.
Objective	Maintain water quality, quantity and timing of flow.	Maintain water quality, quantity and timing of flow.	Maintain water quality, quantity and timing of flow.
Watershed characteristics	Very small streams and spring recharge areas often with indistinct catchment boundaries and channels. Drainage patterns and sensitive areas can not usually be determined from existing mapping.	Erosion prevention is the principle concern. Sediment is likely to reach intakes. Streams may be of sufficient size to cause debris flows or bedload movement. Peak flow becomes a concern in larger streams in this class.	Slope failure, sediment delivery and channel stability are the key factors in maintaining water quality. Peak flow is a concern.
Strategy	Detailed mapping required. Forest development plan should address hazards for specific local conditions.	The domestic watershed report card may prove useful but must be accompanied by ground-truthing local conditions. Forest development plan should address hazards.	Reconnaissance level assessment required using domestic watershed report card. In larger watersheds assessment by sub-drainage becomes important. Forest development plan should address hazards.
Target conditions	Avoid problem areas. Minimal disturbance of sub-surface drainage patterns and surface channels. Recommend ECA < 30%.	Avoid problem areas which could result in sediment movement. Minimize roads and stream crossings. Recommend ECA < 30%.	Distribute cut by elevation and sub-drainage to reduce peak flows. Mitigative action plans are required for problem areas. Recommend ECA < 35%

	Class 1	Class 2	Class 3
Watershed type	Springs and very small streams	Small streams with defined drainage area <500 ha.	Larger streams with defined drainage area >500 ha.
Data requirements	Recommend level B or C terrain and soils mapping. Detailed mapping of drainage patterns, drainage areas and water intake and stream locations.	Recommend level B or C terrain and soils mapping. Detailed mapping of drainage patterns and drainage areas may in required in portions of the watershed.	Recommend level D terrain and soils mapping to ensure the effective application of the domestic watershed report card.

In the second stage of planning, the forest licensee or SBFEP must incorporate the assessment information and recommendations into the forest development plan. Riparian management and other forest management practices particular to domestic watersheds must be incorporated into the various operational plans.

When the forest development plan is advertised for public review, the forest company (or the Ministry of Forests for the small business program), will make a reasonable attempt to notify the affected water licensees that:

a) the BLANK forest development plan is being offered for review (date, time, place);
b) the forest development plan proposes harvesting or roads in the BLANK domestic watershed within the next five years.

This process will ensure that water licensees are notified about the proposed activity and are aware of their opportunity to comment on the forest development plan. Public input will be facilitated by the inclusion of the watershed assessment which will give water users an indication of existing and proposed impacts to the watershed.

The responsibility for approving forest development plans which cover areas in domestic watersheds, rests solely with the MOF district manager. This is unlike the situation in community watersheds where, under the Forest Practices Code, forest development plans must be approved by both the district manager and a designated environment official. The district manager must be satisfied that the forest development plan complies with the FPC, adequately manages and conserves the forest resources and, lastly, is consistent with any higher level plan.

This guideline should be considered baseline management which can be applied to all domestic watersheds regardless of the number of users or other management issues. Obviously, there are some domestic watersheds where the consequences of a damaged water supply are very high and others where the consequences are relatively low. In some high consequence areas, it is

expected that more planning, assessment, monitoring and public involvement will be necessary to address all issues.

For mineral exploration activities, the need for public consultation will be considered on a project-by-project, site-specific basis when activity is proposed in domestic watersheds.

B. 3.6.5 Contingency Planning for Domestic Watersheds

The contingency planning section was largely brought over from the Community Watershed Guidebook. Work will continue on this section with the goal of improving clarity and providing better definition of agency roles and responsibilities. Any changes to this section will be made in compliance with the plan ammendment procedures outlined in Chapter 6.

a) Forest Activities

This section describes the purpose, content, and the roles and responsibilities associated with the development and execution of a contingency plan for a domestic watershed.

Elements of a contingency plan

A contingency plan will help provide for the supply of emergency water and for the rehabilitation of the water system should damage occur. The contingency plan is based on the principle of *immediate response* to water supply problems. Aspects of a contingency plan for a domestic watershed are as follows:

- A contingency plan should be adopted for domestic watersheds with input from water users, forest companies, MOF and MELP.
- The contingency plan will normally apply only to forest activities on Crown lands within the domestic watershed. Water users can expand the focus to broader issues (e.g. private land or other resource uses) by establishing agreements with other parties.
- The contingency plan should identify:
  - a list of participants which will usually be comprised of water users, forest company, MOF, MELP and sometimes MOH;
  - names, addresses and phone numbers of the initial contacts to ensure proper action (Figure 3.1 “Emergency response flow chart”);
  - procedures for the provision of alternative water supplies for the water users serviced by the domestic watershed. These can include, for example, the use of water tankers, wells, or pipelines from adjacent drainages;
  - in some cases, a description of procedures to mitigate some potential water supply impacts (e.g., the construction of settling ponds, the laying of bypass pipe, and construction of a filter system to clarify water).

EMERGENCY

1. PROBLEM AND INITIAL EMERGENCY RESPONSE

- **Landslide or Major Sediment Disturbance**
  Provincial Emergency Program (major disturbance)
  Timber (or other) licensee
  Ministry of Forests, district manager
- **Chemical Spill**
  Provincial Emergency Program
  BC Environment, Environmental Protection Division (EPD)
  Ministry of Health, Regional Medical Health Officer
- **Sudden, Inexplicable Loss of Water**
  BC Environment, Water Management Division
- **Outbreak of Water-Borne Disease**
  Ministry of Health, Regional Medical Health Officer

2. IS EMERGENCY WATER SUPPLY REQUIRED?
If *Yes*, contact Provincial Emergency Program

3. RESTORE WATER SUPPLY

4. REPAIR CAUSE OF WATER SUPPLY DISRUPTION
Restore and repair the water supply as quickly as possible.

Responsibilities:
- Resource licensees, or contractors, where damage has resulted from their actions.
- Ministry of Forests (or other ministry), where damage has resulted from expired forest (or other) tenure.
- Water purveyor, where damage has resulted from natural events.

Emergency Response Team
Where the cause of the disruption in uncertain or not agreed upon, notify Ministry of Health, Ministry of Forests or BC Environment (Water Management and EPD), and request assistance of an Emergency Response Team.

Figure 3.7.1 **Emergency response flow chart**

General roles and responsibilities

Whenever there is an event which adversely impacts the quality or quantity of water within a watershed by disrupting or damaging a water supply or by posing a health risk, every effort shall be made to re-establish the supply, or mitigate harmful effects, as quickly as possible. In some situations this may require that the participants undertake the necessary remedial action using any available resources before responsibility is determined.

The roles and responsibilities of the participants may vary between plans. The remainder of this section summarizes typical roles and responsibilities.

Water licensees

The roles and responsibilities of the water licensees are to:

- Be responsible for the installation and maintenance of systems consistent with their licensing, and capable of handling the natural ranges of water quantity and quality from the source, including sediment loads.
- Participate in field inspections and reviews of road construction, logging operations and other resource developments and advise the government ministries and resource licensees of their concerns.
- In cooperation with the appropriate agencies and other resource licensees, restore a disrupted water supply as quickly as possible to minimize the impacts on the water users.
- Assist other resource users in the rehabilitation of the water resource and water systems where there is an impairment of water quality or quantity due to resource development.

Ministry of Health

The roles and responsibilities of the Ministry of Health are to:

- Upon request, assist with the emergency investigation and response in the event of impairment or disruption of water quality or quantity.

Ministry of Environment, Lands and Parks (Water Management Division)

In most contingency plans, the Water Management Division will be the lead participant from the Ministry of Environment, Lands and Parks. In addition, the Environmental Protection Program, Fish and Wildlife Branch and the Conservation Officer Service may be requested to participate depending on the circumstances.

The roles and responsibilities of the Water Management Division are to:

- Upon request, assist with the emergency investigation and response in the event of impairment or disruption of water quality or quantity.
- In cooperation with appropriate provincial ministries, adjudicate disagreements over responsibilities and determine what remedial actions are required and by whom, as legislated under the *Water Act* and other applicable legislation.

Ministry of Forests

The roles and responsibilities of the Ministry of Forests are to:

- Direct Ministry of Forests tenure holders to rectify situations arising from activities authorized by the ministry which have the potential to impair or degrade water quality or quantity.
- Through the district manager, initiate repair of damage to a water supply if a Ministry of Forest tenure has expired.
- Upon request, assist with the emergency investigation and response in the event of impairment or disruption of water quality or quantity.
- In cooperation with appropriate provincial ministries, adjudicate disagreements over responsibilities and determine what remedial actions are required and by whom, as legislated under the *Ministry of Forests Act*, *Forest Act*, *Range Act*, and other applicable legislation.
- Assume the role and responsibilities of a forest licensees, as set out in this section under "Resource licensees and tenure holders", when the Ministry of Forests carries out operations under the Small Business Forest Enterprise Program.

Ministry of the Solicitor General (Provincial Emergency Program)

The Provincial Emergency Program (PEP) helps local governments and provincial ministries prepare for, and respond to, disasters which threaten life and property.

PEP may:

- Assist in providing emergency potable water in the event of an emergency which causes damage to or loss of a water supply which is beyond a water purveyor's or a licensee's ability to resolve.
- Act as a facilitator in resolving an human or environmental emergency.
- Provide emergency financial assistance to others for the purposes of repairing a damaged water supply through the Disaster Financial Assistance Program.

Forest licensees and tenure holders and their contractors

The roles and responsibilities of forest licensees and their contractors are to:

- Advise affected water licensees of planned interruptions or potential sediment increases as a result of their activities.
- Immediately advise the water licensees, Water Management, and the Ministry of Forests of any situation for which they are responsible, or which they observe, which is potentially harmful to water quality or quantity.
- Immediately take remedial action to correct any situation arising from their activities which may potentially impact water quality and quantity, or otherwise damage a water supply system.
- Cooperate with the water purveyor or licensees, and the appropriate agencies, to restore a disrupted water supply as quickly as possible, thereby minimizing the impacts on the water users.

Determination of responsibility

The objective of the contingency plan is to have all water supply problems resolved as quickly as possible and, where necessary, to determine responsibility following rehabilitative work. Where damage to a water supply occurs:

- Refer to the contingency plan flow chart to identify the sequence of events in solving an unplanned impairment to water supplies.
- If a contractor or forest licensee is on site, the contractor or licensee and a representative of the water users should endeavor to determine the nature of the problem and the responsibility for the impairment, and agree upon a procedure to correct it. This should be done within 12 hours of impairment being reported.
- The regional water management office and the Ministry of Forests district office shall be notified immediately of any impairment which cannot be corrected within 12 hours.
- Where the forest licensee and the representative of the water users cannot agree on the type and extent of, and responsibility for, remedial action, they shall immediately notify either the Water Management Division or Ministry of Forests to request the involvement of an Emergency Response Team.
- An Emergency Response Team will be comprised of staff from the Water Management Division of the Ministry of Environment, Lands and Parks, the Ministry of Forests, a representative of the water users and, where appropriate, the resource licensee/contractor. Involvement of the Provincial Emergency Program may also be requested depending on circumstances. Outside experts may be called upon at the request of the team.
- The Emergency Response Team will be responsible for determining the source and cause of damage to the water supply, and preparing recommendations regarding the type of remedial action required and responsibility for its completion. This should be done within 4 days of identification of the problem.
- The Emergency Response Team will submit a report on its findings to the regional water manager, Ministry of Environment, Lands and Parks, and the district manager, Ministry of Forests, with recommendation regarding the assignment of responsibilities. The final decision regarding responsibility and the recovery of costs will rest with the two managers.

  The contingency plan is intended to expedite local solutions to water-related problems, but does not preclude a private person or corporation from pursuing individual legal remedies for damage to water quality or quantity.

Specific responsibilities

Short-term planned disruptions

Occasionally, the water users and the licensee/contractor agree to allow a short-term planned disruption of a water supply. The licensee/contractor will:

- give a minimum of one weeks' notice to the water users to allow planning for the water supply disruption.

- be responsible for costs incurred by water licensees to change the water system. These can include costs to:
  - access and utilize a temporary water supply;
  - clean the infiltration gallery or intake dam where appropriate;
  - deliver water to households for minimum domestic requirements.

  If a disturbance to a water supply system lasts longer than 48 hours, it is considered a long-term problem (see section 3.4.3 “Long-term disruptions”).

Short-term accidental disruptions

If a short-term accidental disruption occurs, the licensee/contractor will:

- Provide assistance to the water licensees to alter their intake system to prevent further disruptions.
- Be responsible for costs incurred to:
  - access and utilize a temporary water supply;
  - clean the infiltration gallery or intake dam where appropriate;
  - deliver water to households for minimum domestic requirements.

Long-term disruptions

If an accidental or planned disruption or pollution problem lasting longer than 48 hours occurs:

- The contractor will continue to be responsible for extra costs incurred by the water licensee until such time as the problem has been rectified.

Ensuring compliance

To ensure compliance with contract conditions and specific responsibilities, under section 3.3.5 “Specific responsibilities”, major forest licensees or permittees are required to post with the district manager, Ministry of Forests, bonds, security deposits or safe keeping agreements for working within the domestic watershed area in the amount of $25,000, or provide documentation of an adequate liability insurance policy.

During operations, and until the district manager is satisfied that all conditions outlined in the relevant tenure documents have been met, the forest licensee should accept the responsibilities associated with operating within a domestic watershed.

Also, it is recognized that, despite all precautions, natural or human-induced damage may occur. If the relevant tenure has expired, the district manager may initiate reparation work. The Ministry of Forests will pursue sources of budgetary funding to conduct repairs required after the term of the forest tenure has expired and after the “free-growing” period has ended.

b) Contingency Planning for Mineral Exploration Activities

There are no provisions for routine contingency plans due to the relatively low level of impact to land and water resources of mineral exploration.However, the need for a contingency plan will be determined on a project-by-project, site-specific basis.

The District Inspector will set the requisite reclamation security, based on appraisal of amount required to rehabilitate site to standards dictated by the *Mines Act* and *Mineral Exploration Code*.

B. 3.7 Front Country Visual Management Guidelines

B. 3.7.1 Introduction

(a) Intent

Design of timber harvesting, forest management and mineral exploration should reflect the importance of front country landscapes to communities, recreation and tourism.

(b) General Approach

This guideline outlines three classes of landscape management for scenic areas. The classes reflect level of sensitivity and significance of landscapes to communities and to tourism.

B. 3.7.2 Location of Scenic Areas

These guidelines will apply to the visual areas identified on Map 5.

Class 1 includes areas visible from designated viewpoints from:

- ***The Trans-Canada corridor (Highway 1) and the City of Revelstoke***

Class 3 includes areas visible from designated viewpoints along:

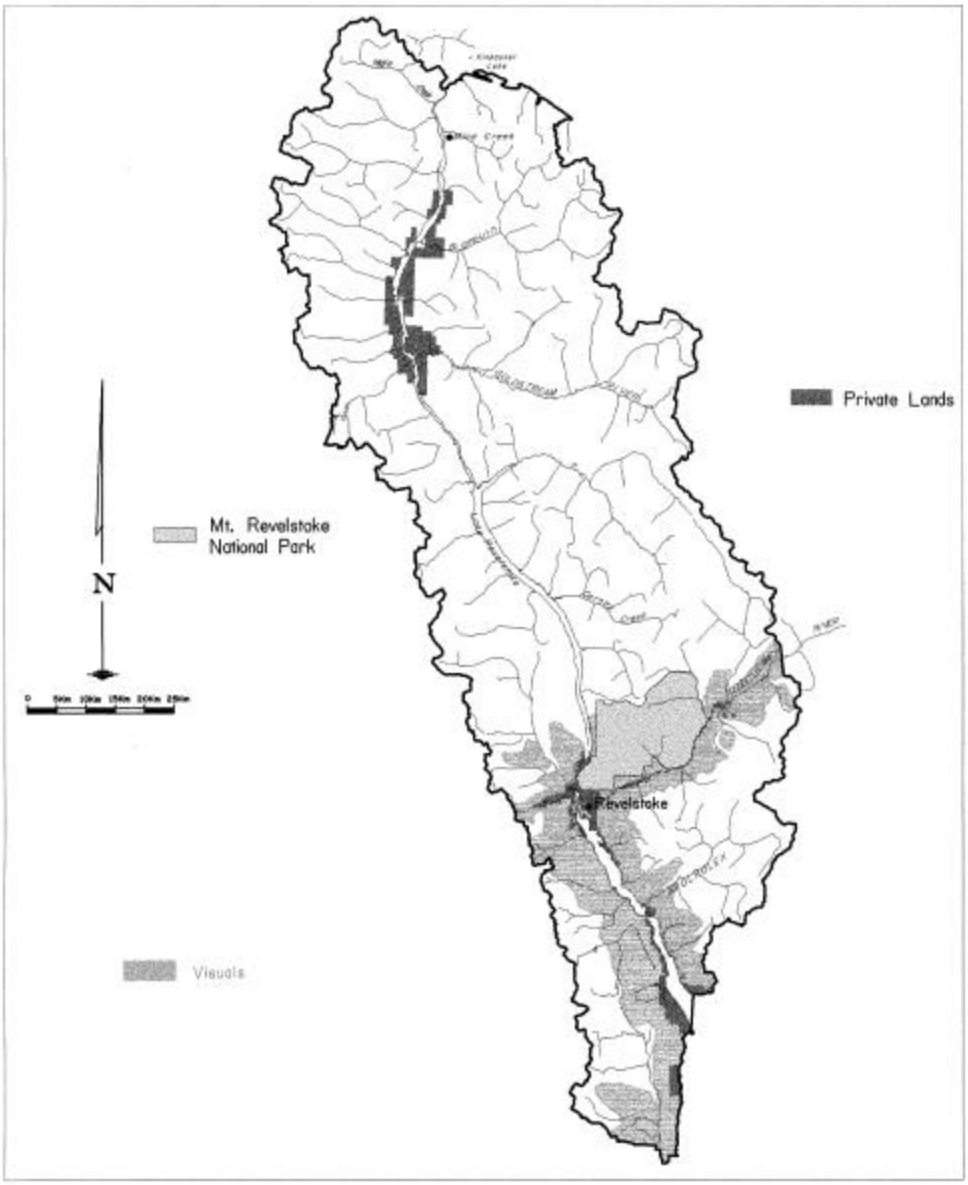
- ***Highway 23S from Revelstoke including the Shelter Bay and Galena Bay ferry terminals***

B. 3.7.3 Operational Guidelines

For the purposes of the following table, *Foreground* refers to landscape up to one kilometer away, *Midground* refers to landscape between one and five kilometers away, and *Background* refers to landscapes between five and twelve kilometers away.

	Class 1	Class 2	Class 3
Landscape Design Intent	In most visible foreground areas and in important or prominent midground areas, disturbance may be discernible but should not be evident in the landscape. In less important or prominent foreground areas, most midground areas, and important or prominent background areas, visible disturbance should remain subordinate in the landscape. In most background areas and less important midground areas, landscape alterations may be visually apparent, but should be designed to blend into the landscape in form and colour.	In most foreground areas, disturbance may be visible, but should remain subordinate in the landscape. In less important of prominent foreground areas, and in midground areas, disturbance may be visible, but should remain subordinate in the landscape. In background areas, landscape alterations may be visually apparent, but should be designed to blend into the landscape in form and colour.	In most foreground areas, disturbance should be subordinate in the landscape. In less important or prominent foreground areas, and in midground and background areas, landscape alterations may be visually apparent, but should be designed to blend into the landscape in form and colour

These guidelines are to be applied in a manner that creates a continuity of design within a viewscape unit.



Map B5. Front country scenic areas

Note: Viewscape are currently being reinventoried from designated viewpoints which will result in new mapping.

B. 3.8 Backcountry Recreation Management Guidelines

B. 3.8.1 Introduction

(a) Guideline Intent

Provide a range of recreation settings, features, facilities and opportunities on Crown Land.

(b) General Management Approach

The above intent will be achieved primarily by maintaining a recreation inventory and, through lower level strategic planning which is consistent with this strategy, to establish recreation objectives at the landscape unit level.

The inventory, establishment of recreation objectives and these guidelines utilize the Recreation Opportunity System (ROS) methodology. The ROS system is used to establish targets for recreation. This classification system states the type of recreation experience a recreation user (commercial or non commercial) would have using the terms; Primitive (P- reserved for Protected Areas), Semi Primitive Non Motorized (SPNM), Semi Primitive Motorized (SPM) and Roaded Resource Land (RRL). The criteria used for the classification are; remoteness, size, evidence of humans, social setting, setting characterization and experience characterization. The following explains the criteria and classification of the ROS system:

- **Semi Primitive Non-Motorized (SPNM)**

The management intent of SPNM areas is to maintain the unroaded character of the area and to provide opportunities for dispersed non-motorized recreation. These areas are generally remote, alpine, subalpine and high elevation forest, high elevation ridges and mountain tops that have not been accessed by roads. Trails provide access for recreation users and BCFS permittees (e.g., livestock permittees). Landscape alterations have been minimal. These areas provide an opportunity to experience a reasonable degree of isolation from the sights and sounds of motorized activity in a natural appearing setting. However, in the winter, these areas may be used by snowmobiles and snowcats (subject to local level strategic planning, local agreements and not in conflict with sensitive wildlife species), which gives a seasonal separation between activities. Helicopter use may occur in any season.

- **Semi Primitive Motorized (SPM)**

The management intent of SPM areas is for dispersed motorized recreation. These areas are accessed by primitive roads or trails suitable for high clearance 4 wheel drive vehicles, ATV's (quads), motorcycles and snowmobiles. All forms of dispersed recreation associated with these kinds of vehicles occur. These lands have been impacted by human activities and may or may not be natural appearing landscapes. Opportunities to get away from other recreation users and to experience solitude are good during most seasons of the year. This classification may be

applied for winter use in alpine and subalpine areas used by snowmobiles and snowcats and is also intended for areas where roads have been deactivated, gated or have access restrictions.

- **Roaded Resource Land (RRL)**

The management intent of RRL areas is for dispersed and facility oriented recreation. These lands are accessed by better than primitive roads and are suitable for most conventional 2 wheel drive vehicles. All forms of dispersed and organized recreation associated with vehicles occurs. These lands have been altered by man and the alterations are visible on the landscape. Depending on season and the nature of the recreation activity, opportunities to experience solitude are rare. (This is the classification used for the operable forest that will be harvested using roads. Non motorized activities also occur in this area such as cross country skiing or canoeing and restrictions may occur that prohibit some conflicting recreation activities).

For all areas outside parks, it was assumed that eventually the operable forest management landbase would be roaded. This means that operable forest land presently in an unroaded state (SPNM/P) would be converted to a roaded or semi primitive roaded condition over time. There is also the possibility that inoperable forest land outside of parks may be roaded at some point in the future for subsurface resource development. This was the basis for stating objectives as RRL or SPM. In most cases the land classified as RRL is the operable forest below the alpine/subalpine and the land classified as SPNM is either inoperable (steep, rocky, canyons, etc.), subalpine forest or alpine in nature.

B. 3.8.2 Application of Guidelines

The guidelines are applicable to recreation facilities and features throughout the area. As decisions must be made at the site specific level, and the recreation features facilities are wide spread and difficult to map at this planning scale, these guidelines will apply, in general, to the following types of areas:

- managed trails for non motorized, cross country and motorized uses
- forest roads
- trails recognized under the Heritage Conservation Act
- backcountry river corridors
- BC Forest Service campsites, cabins and historic sites
- backcountry lodges, commercial cabins and camps
- areas tenured under by BC Lands for commercial backcountry recreation
- unroaded lakes
- cave/karst areas

B. 3.8.3 Operational Guidelines

a) Backcountry recreation guidelines

Table 8.1 Operational Guidelines for Backcountry Recreation

Feature	Definition	General design intent	Visual design	Access management
Hiking trails, Multi-use trails	Trails managed by BCFS with objectives for motorized or non-motorized activities	Resource exploration and development activities should be designed to minimize disruption to trail corridors. Where substantial disruption is unavoidable, licensees should be directed to re-establish trails. Ideally, new and relocated trails should be designed to avoid future logging activity and mineral exploration		Road crossings of trails should be kept to a minimum.
Cross-country ski trails	Trails managed by BCFS with objectives for cross-country skiing. May include trails managed for other recreational uses in summer.	Where resource exploration or development is proposed on, or adjacent to an area suitable for cross-country skiing, roads and skid trails should be designed for subsequent use as ski trails. For example, design road right-of-ways to be as narrow as possible (<8 m) and have variable grades and suitable alignment to provide cross country ski trails.		
Campsites, cabins, historic sites	Forest Service campsites, named historic sites	Resource exploration and development should minimize potential impacts to the immediate surroundings of the site.	Any logging within 200m of the site should be designed such that modification may be discernibly but not clearly evident from the site.	
Lodges, Commercial cabins Camps	Permanent or semi-permanent camps or structures associated with commercial tourism tenures, without highway access.	Resource exploration and development should minimize potential impacts to the immediate surroundings of the site.	Any logging within 200m of the site should be designed such that modification may be discernibly but not clearly evident from the site. Statements of concern and interest are to identify areas requiring particular design consideration.	Tenure-holders should be consulted to determine particular needs regarding access management.
Tenured or Licensed use areas	Areas tenured for commercial recreation under the *Lands Act*	Resource exploration and development activities will be evident in tenured use area. Where possible, this activity should be designed to compliment or minimize conflict with commercial recreation activity.	Resource exploration and development in tenured use areas should show evidence of good visual design. Statements of interest and concern are to identify areas requiring particular design consideration.	Tenure-holders should be consulted to determine particular needs regarding access management.

Feature	Definition	General design intent	Visual design	Access management
Backcountry lakes	Lakes, 2 ha or larger, with no road or highway access within 500m.	Backcountry lakes should be managed to maintain an unroaded condition (ROS Semi-Primitive Non Motorized).	Any logging within 200m of the lake should be designed such that modification may be discernibly but not clearly evident from the lake.	Where practical, no new, permanent roads should be constructed within 1 km of backcountry lakes. Where practical, existing roads within 1 km of backcountry lakes should be decommissioned.
Cave / karst features	Areas with significant cave or karst features	Resource exploration and development activity should be designed to minimize disruptions to hydrology and terrain that would adversely affect the karst feature. Slash should not be deposited in openings and sinkholes. Significant cave openings should be protected with a 30m reserve.		

b) Commercial recreation tenures

- **Referral of commercial recreation tenure applications**

All new commercial recreation tenure applications and tenure renewal applications will be referred to resource agencies and existing resource tenure holders to ensure potential conflicts are identified and addressed before tenures are approved.

- **Statements of interest and concern**

Tourism tenure holders will prepare statements of concern and interest for consideration during development planning which include the following:

- ***Crown land areas of particular significance to the tourism-related tenure holders***
- ***other resource values and interests***
- ***proposed approaches to resource development***
- ***information required in operational planning processes***

B. 3.9 Guidelines for Timber Management in Timber Enhanced Resource Development Zones

The following guidelines have been defined for Enhanced Resource Development Zones – Timber (ERDZ-T) in the Kootenay-Boundary Land Use Plan Implementation Strategy. While the concept of ERDZ-T does have application in Revelstoke, further work is required to define criteria and operational guidelines appropriate for this area. ERDZ-T areas will then be identified based on the locally developed criteria. The regional guidelines are included as a starting point for developing local criteria.

B. 3.9.1 Introduction

(a) Guideline Intent

To increase volumes of merchantable timber, to streamline the permitting process and provide associated employment benefits, while maintaining basic environmental quality.

(b) General Management Approach

The above intent will be achieved by applying the following operational guidelines within the Timber Enhanced Resource Development Zone (ERDZ-T) land use designation. The guidelines reflect an emphasis on promoting timber supply through application of intensive silvicultural practices, including timber harvesting on appropriate sites within the zone. Environmental stewardship on these lands will be maintained through application of FPC requirements.

Although intensive forest management will also be practiced on other lands in the region (i.e., within the Integrated Resource Management Zone (IRMZ), and potentially in selected pockets within the Special Resource Management Zone (SRMZ), the ERDZ -T reflects a relatively high concentration of sites suitable for intensive forest management practices, given the average to above average timber productivity and the absence of regionally significant environmental, recreational and tourism values on these lands. Accordingly, these lands reflect the best opportunity, based on biophysical attributes, to focus intensive silvicultural activities, including harvesting, in the long run.

B. 3.9.2 Location of ERDZ - T

The operational guidelines below, generally apply to the operable land base within the KBLUP's ERDZ-T designation. Areas designated for the following values are not candidates for application of ERDZ-T guidelines:

- community watersheds
- domestic watersheds
- high and most intermediate biodiversity emphasis areas (as per the FPC Guidebook)
- most regional connectivity corridor
- caribou 1 and 2 habitat

- Coal ERDZ areas

The intent is to exclude key areas of the following from ERDZ –Ts, however more work is required to identify areas and negotiate appropriate boundaries:

- regionally significant visual values
- requirements for red listed and other blue listed species
- high value fish
- key winter ranges
- settlement lands
- Agricultural Land Reserve land

When appropriate areas can be identified, it is expected EDRZ-T guidelines, while meeting Forest Practices Code standards, will take precedence over other guidelines.

B. 3.9.3 Operational Guidelines

On appropriate sites within the operable area of the ERDZ-T, emphasis will be given to increasing timber supply through the intensive application of silvicultural regimes (i.e. various combinations of harvesting, site preparation, artificial regeneration, spacing, pruning, fertilization, commercial thinning). In particular the following practices will be promoted, within the requirements of the Forest Practices Code.

(a) Reforestation

- Accelerated backlog (incremental) reforestation, including site preparation, planting and brushing, will be applied to harvested areas.
- Maximizing efforts to reduce regeneration delay (with exception of winter ranges).
- Larger, genetically improved stock will be planted to reduce the green-up period, achieve full site occupancy, and increase long-term yields.
- Density control to be applied rigorously at the free to grow stage.

(b) Fertilization

- Multiple fertilizations per rotation may be applied to suitable sites to reduce time to green-up and to increase long-term yields.

(c) Pre-commercial / Commercial Thinning

- Multiple, pre-commercial and commercial thinnings will be undertaken where economically feasible and biologically appropriate, to recoup mortality losses, improve timber quality and increase short-term timber supply.

(d) Species Management

- Optimal species selection and single species management will be applied where ecologically suited to the area.
- Effective vegetation management practices will be applied, possibly including herbicides to control competing vegetation and enhance growth of crop species.

(e) Utilization

- Enhanced utilization standards may apply (within the bounds of long-term sustainable timber productivity and basic biodiversity requirements).

(f) Rate of Cut

- Rate of cut will be guided by the results of standard watershed assessments
- Harvest ages and rotations will be determined primarily by maximizing timber volume.

(g) Biodiversity Management

- ERDZ-T areas will be managed predominantly at a low emphasis biodiversity level. Forest interior conditions will be no more than 10% of the required old seral area. The remaining 90% may be partially harvested (up to 30% of the volume in this remaining 90% may be removed in the first entry).
- Within patches, the green-up requirement between cutblocks will be based on successful silviculture planting, based on silviculture surveys, while between patches, green-up will be similar to the Integrated Resource Management Zone. See Table 1 below for preferred patch size distribution for each natural disturbance type (NDT).
- Wildlife tree patches will be implemented as per the Forest Practices Code Biodiversity guidebook.

(h) Protection

- Intensive forest health surveys and effective pest management techniques will be applied to protect timber values and silvicultural investments, in accordance with FPC requirements, while minimizing impacts on significant non-timber resource values.

(i) Timber Harvesting Land Base

- Within the ERDZ-T, emphasis will be placed on increasing the timber harvesting land base through:
  - development and application of new and innovative harvesting technologies
  - increasing the utilization of stands that have been excluded (problem forest types, deciduous stands)
  - minimizing site degradation.

Table 1
Distribution of Patch Sizes for Each NDT

	Patch Size (ha)	Per Cent Forest Area Within Landscape Unit Within ERDZs
NDT1	<40	30
	40-80	30
	80-250	40
NDT2	<40	30
	40-80	30
	80-250	40

B. 3.10 Access Management Guidelines

B. 3.10.1 Introduction

(a) Guideline Intent

To provide the necessary strategic direction on access management required to balance and integrate the range of resource uses and interests.

Highways, Forest Service Roads and Operational Roads serve the public, the forest industry, small business, tourism, mining, the petroleum industry and other interests by providing access to Crown land. However, roads can pose a challenge for managing and maintaining environmental and social values. Therefore, access management must promote an integrated, flexible approach for managing the landbase and all values through the maintenance of a network of highways and forest roads, to provide access for all uses, while giving careful consideration for the siting of new roads and the regulation/deactivation/rehabilitation of existing roads in order to meet the range of resource objectives and strategies.

While it is recognized that access issues are best dealt with at a more local or operational scale, these guidelines are intended to provide both strategic direction on access management to guide local level strategic planning and also interim direction until such local level strategic planning can be completed. Specific access management objectives that are to be addressed through landscape unit plan objectives and strategies, operational level plans, such as Forest Development Plans, and the regular permitting processes administered by various government agencies, are identified through the:

- Biodiversity and Connectivity Guidelines, section 3.2.;
- Grizzly Bear Guidelines, section 3.3.;
- Ungulate Winter Range Guidelines, section 3.4.;
- Mountain Caribou Guidelines, section 3.5.;
- Backcountry Recreation Guidelines, section 3.6;
- General objectives and strategies, particularly with respect to alpine/sub-alpine areas;

(b) General Management Approach

The above intent will be achieved by applying the following general measures:

- Licensed and government authorized resource users have access, including road access, to all Crown Land outside of Protected Areas for the purpose of potential resource development. The timing, location and duration of road and other forms of access will recognize and be consistent with the resource management objectives and strategies, the Forest Practices Code and all other relevant government policy and legislation, to ensure sensitive values are adequately managed.

- Existing roads will be used wherever possible and the amount of new road construction will be kept to the minimum necessary for balancing and integrating access and management for all values.
- Owners of private land, holders of crown tenures or utility companies will have their access needs evaluated in all areas outside of protected areas. The goal is to seek accommodation for such access needs, including potential road access, with location and management options subject to the range of resource management objectives and strategies.
- Access management will be flexible and therefore able to accommodate changing technology and societal values.
- Access management will be used to maintain a range of recreational opportunities on Crown Land.
- Access restrictions, including road closures, deactivation and rehabilitation, will involve public, industry and stakeholder consultation, except when closures or restrictions are related to public safety issues. In the rare cases where roads do not meet Forest Practices Code standards and must urgently be deactivated, affected government agencies will be consulted and tenure holders notified.
  Revised wording

B. 3.10.2 Access Management Planning Priorities

As was noted in section 3.10.1, specific access management objectives are outlined in various guidelines, most of which include accompanying maps identifying the areas within the area that such guidelines are to be applied.

As well, areas of potential concern for further access development have been identified in the Landscape Unit Objectives and Strategies (Chapter B Section 4) and Action Plan – Resource Management Projects (Chapter D Section 3). Such areas are deemed to involve sensitive values which require careful consideration in order to meet the resource management objectives and strategies. The intention is to maintain and revise a list of areas of potential concern and identify such areas in the annual report (see *Kootenay-Boundary Land Use Plan Implementation Strategy* (June, 1997) Chapter 6).

B. 3.10.3 Operational Guidelines

(a) Access management strategies

In order to achieve the intent of integrating and balancing access requirements, the management of all values must be flexible at the site specific level. The following “tool box” for access management includes strategies which may be used independently, or in combination, in a particular area to achieve the desired access objectives:

- seasonal road and activity restrictions through:
  - gated road closures/area closures/legislated closures to be administered through the Forest Practices Code
  - signage

- scheduling of development, construction, deactivation (including the seasonal use of heavy equipment to minimize noise disturbance);

- type and location of road development;
- discourage the construction of loop roads and parallel roads;
- longevity of all types of roads, including requirements for deactivation/rehabilitation prior to approval of new road permits;
- industrial access only;
- two pass timber harvesting system with accompanying road deactivation/rehabilitation requirements;
- non conventional timber harvesting and silvicultural systems;
- emphasize low impact forms of access in currently unroaded areas during the early stages of mineral exploration. In some circumstances, low impact access may equate to a road;
- zoning of recreation uses (commercial/non commercial as well as motorized/non motorized) to provide a range of recreation opportunities and to support the management of sensitive environmental values;
- in areas zoned for recreation uses, the management/movement of problem bears or other wide ranging carnivores may, in exceptional circumstances, be required to maintain access for recreation uses;
- hunting and fishing regulations to redistribute the seasonal access pressures, and;
- improve management of utility corridors by managing and regulating motorized use seasonally and as necessary.

(b) Application of Strategies

Regular permitting and operational decision-making processes

The application of specific strategies to areas of concern will be undertaken with an integrated and planned inter-agency focus, in accordance with the general management approach outlined above. In general, the decisions on such issues will be dealt with through the regular permitting processes, including the required referrals.

The Forest Practices Code requires new road permits to address maintenance, deactivation and rehabilitation, where practical, prior to approval. This can be done through the Forest Development Planning process or, alternatively, through access management or other strategic plans.

Enhanced referral process

An enhanced inter-agency referral process will be utilized for proposed new access development in areas of concern (see 10.2) or other areas which, through the regular permitting process, are identified as requiring additional consideration. Enhanced referrals encompass a broader range of referees and an expectation of more stringent approval conditions.

In an access-related enhanced referral, the legislated decision-making government agency will notify an inter-agency technical review team. Membership on the technical team will consist of government staff who have in-depth knowledge of the resource management objectives and strategies and who represent all agencies responsible for their development. The technical team member who represents the decision-making government agency will coordinate the process where the team works with the legislated decision-maker to define the specifics of the process.

The enhanced referral process may include:

- additional information requirements by the proponent;
- identification of additional stakeholders to be notified through the newspaper or consulted directly and the means to receive their comments and advice;
- a joint field assessment by all affected agencies;
- a presentation by the proponent to the inter-agency review team;
- identification of the area as a priority for completion of a landscape unit plan. In exceptional circumstances, if the landscape unit planning process is deemed to be unable to address the situation within an adequate timeframe, a more immediate form of resolution at the landscape level will be recommended.

The proponent will be notified by the decision-making agency as soon as possible that the proposal is in a sensitive area and requires an enhanced referral. The inter-agency technical team will commit to working with that agency to ensure an efficient process. The decision-maker will document the rationale for decision and make it available to all interested stakeholders.

B. 3.11 Guidelines for Providing Crown Land for Settlement Uses

B. 3.11.1 Introduction

(a) Guideline Intent

To recognize that, where appropriate, Crown Land will continue to be utilized for settlement uses; to provide information on which portions of the landbase might be considered for settlement uses; and to describe the process that will be followed in considering settlement allocations.

For the purposes of this guideline, settlement is defined as the use of Crown land for residential, recreational, community and industrial purposes. This guideline is not intended to address other settlement-type activities, including the use of Crown land for roads, utilities or communications sites as these occur in all areas of the landbase outside of protected areas. These kinds of uses are authorized by lease or license and the land base continue to be held in the name of the Province. Land used for agriculture and back-country tourism and recreation are addressed through other aspects of this strategy (e.g., Resource Management General Direction and other relevant guidelines in this section). It is recognized that commerical ski resorts are a unique land use that includes both residential, recreational, commercial and community settlement at the base, and skiing terrain on adjacent Crown land that is managed for resort use and compatible resource values.

(b) General Management Approach

Identification of specific lands that will be allocated for settlement uses cannot be achieved at the this planning scale of resolution. therefore, the intent will be achieved by following the existing BC Lands policy and procedures and integrating settlement uses with other values. The objectives, strategies, guidelines and accompanying maps in this strategy will be utilized to ensure integration of settlement land use decisions with other values. The Growth Management Strategies (see *Resource Management General Direction, Chapter B, Section 2, Appendix A*) provides additional guidance for planning and delivering settlement opportunities.

It should be noted that settlement will access only relatively small portions of the Crown land base, and only portions of the settlement corridor, that is identified on the Settlement Land Map (Map 6), will be utilized for settlement purposes. Sales of Crown land for settlement purposes are normally in the range of 200-500 hectares. This suggests that, assuming stable settlement patterns, less than .6% of the area will be allocated for settlement purposes over the next 100 years. However, it is recognized that most settlement occurs in the low elevation valleys within the area. As a result, human settlement overlaps with critical low elevation wildlife habitats, regional connectivity corridors, high productivity forests, etc. The information provided within this strategy will assist the process of integrating settlement with other land uses.

Private land is, from time to time, acquired by the Province, for habitat, park purposes or is returned because of tax reversions. As well, some settlement uses are temporary and the land is returned to resource use once the interim use is complete.

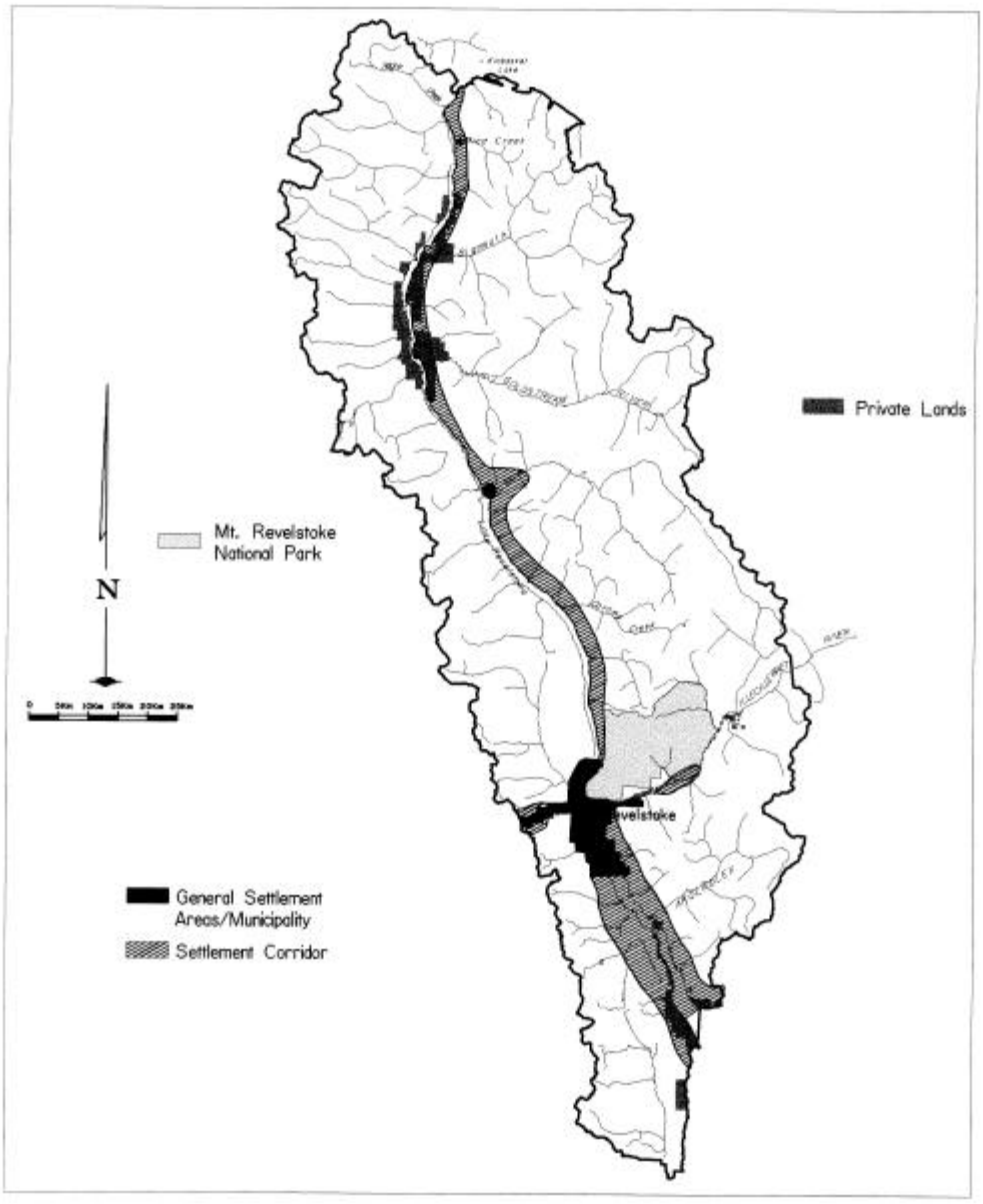
B. 3.11.2 Spatial Application of the Guidelines

This guideline can apply to any portion of the area. However, to provide understanding where settlement opportunities likely exist, provide assistance to resource managers and provide direction to local level strategic planning, a Settlement Land Map (see Map 6) has been prepared. The map identifies areas likely to be considered for settlement purposes.

There are two types of settlement areas:

Community areas includes those lands within existing municipal boundaries and regional districts as well as areas that have been identified through an Official Community Plan. (This area is differentiated from the settlement corridors on 1:500,000 maps that are available for resource managers as required for further planning and decision-making. The scale of maps included in these guidelines makes these areas too small to usefully depict.) Within the community areas there is a relatively high percentage of private land. Most of the existing population resides in or near these locations and the limited Crown land in these areas often has a high value for a variety of settlement uses. Community plans provide direction about the kind of land uses that are expected. The community areas exclude large blocks of land (greater than 250 hectares) that have been identified through Official Community Plans as being for natural resource values only.

These lands often also contain significant value for a variety of provincially managed resources. While resource management will continue on Crown lands within the community areas, it is recognized that some of these lands will, in time, be converted into settlement uses. Long term commitment to resource activities should recognize the potential for human settlement and take appropriate measures to integrate resource use activities.



Map B6. Settlement Areas

Settlement corridors are areas between existing community areas. While the majority of the 8,500 local population is located in the community areas, the settlement corridors identify lands adjacent to transportation routes where there is already extensive private lands or where specific settlement opportunities are known. Crown lands within the settlement corridors are often important to support adjacent communities for a range of activities, including landfills or quarries, that do not fit into the more intensely utilized community areas.

The amount of Crown land within the settlement corridors varies from 25-75%. This is a significantly higher percentage than that in the community areas. As a result, resource management for a range of ongoing and long term commitments occurs within these areas. Consultation with the appropriate provincial and municipal government agencies is appropriate with respect to long term resource commitments.

B. 3.11.3 Operational Guidelines

The Province is under no obligation to accept or approve any application for settlement use. Programs and procedures change on an ongoing basis to reflect enhanced management and government policy.

Land applications will continue to be received from eligible applicants for community, commercial and industrial settlement uses throughout the land base, although the majority will be located within one of the two types of settlement areas.

Proactive identification of opportunities to provide residential, recreational, commercial and industrial lands in conjunction with communities and stakeholders will continue. While the entire land base may be considered for settlement purposes, most proposals will be in the community areas, with some in the settlement corridors. Efforts will also be made to avoid or accommodate the requirements for regionally significant biodiversity connectivity corridors (see 3.2) and wildlife habitats. Allocations of Crown lands for settlement purposes will also consider official community plans and rural land use bylaws.
Planning initiatives may further identify specific Crown lands that should be considered for allocation and add or remove lands to the settlement areas.

(a) Consultation

In carrying out assessment of applications or of government-initiated proposals for settlement uses, there is a commitment to consultation with all interested government agencies. In addition, new uses that are proposed for the Crown land are advertised so the general public has an opportunity to provide input.

(a) Decision-making

In making land use decision, the Province relies on the feedback received from agencies and stakeholders and the following principles:

1. identifying the most suitable use for a parcel of land
2. minimizing conflicts and incompatibility
3. using land efficiently and effectively
4. contributing to the provincial economy
5. supporting community development, public works and institutional uses
6. maintaining a high quality environment
7. protecting important physical and biological features
8. allocating Crown lands responsibly
9. recognizing and respecting First Nations interests
10. conserving and managing aquatic lands
11. cooperating with other government agencies
12. allocating and using Crown lands fairly
13. administering Crown lands fairly
14. retaining options for future land use
15. maintaining consistency with Growth Management Strategies
16. consideration of regional district and municipal official community plans and regional district rural land use bylaws.

Decisions rely on the information received from referrals to achieve the above principles. The data available in this strategy will enhance decision-making.

B. 3.12 Subsurface Resources Guidelines

B. 3.12.1 Introduction

(a) Guideline Intent

To describe the management of subsurface resources and recognize the need for flexibility in all resource management guidelines, based on the unique nature of subsurface resources. Exploration for these hidden resources requires access to as much land as possible. However, advanced exploration and development activities occur over a relatively small area. Therefore, consistent with government's March 1995 KBLUP decision, these recommendations confirm the acceptability of access for, and activities related to, subsurface resource exploration and development on all Crown lands outside of protected areas[1]. Access to mineral tenures is also endorsed by statute in the *Mining Rights Amendment Act*, which complements the *Mining Right of Way Act*. Access on mineral tenures is regulated by the *Mineral Exploration Code*.

Exploration and development activities will be managed to mitigate impacts on t known sensitive values, and to honour the intent of non-mining resource management guidelines, through specific permitting conditions. A flexible approach by all resource managers will be required to achieve the land use plan objectives.

For the purposes of this Guideline, subsurface resources are defined as bedrock and placer minerals, coal, oil, natural gas, coalbed methane and geothermal resources. The definition does not include groundwater resources. Also, for the purposes of this Guideline, references to permitting processes are intended to be generic and cover all application review and approval processes for subsurface resources (e.g., inter-agency referrals; project review processes managed by the Mine Development Review Committee and the Environmental Assessment Office).

Large-scale development proposals, including mines, processing facilities and pipelines, are reviewed through a process coordinated by the Environmental Assessment Office (EAO). The EAO process will evaluate the degree of compatibility of a development proposal with the specific resource management objectives and guidelines in this plan and relevant to the vicinity of the development. The March 1995 KBLUP decision by government confirms that such development proposals are an acceptable land use on all Crown Lands outside of protected areas.

[1] This includes, for example (and without limitation), old growth management areas, no-harvest areas, riparian management areas, stream and lake shore management zones, forest ecosystem networks, wildlife habitat areas, wildlife and biodiversity corridors, environmentally sensitive areas, roadless areas, wilderness areas, community and domestic watersheds, forest recreation sites and trails, and any areas with identified visual quality objectives, biodiversity emphasis options, or recreational opportunity designations.

(b) General Management Approach

Through the March 1995 KBLUP decision, government committed to provide certainty of access to subsurface resources for exploration and development activities. As noted earlier, the hidden nature of subsurface resources poses particular challenges to managing other resources relative to subsurface resources. Mineral deposits, for example, cannot be moved, consequently exploration or development activities can not be transferred to other sites. This constraint requires that the management of all other resources and activities at these sites must be sufficiently flexible to accommodate subsurface resource activities.

Permit applications will be reviewed to ensure consistency with the direction provided through the government's March 1995 KBLUP decision regarding access and these recommendations, and will be implemented through existing regulations. For mineral exploration, the *Mineral Exploration Code* is the main mechanism for implementing such decisions. For energy resources, the normal tenure review process and activity referral processes will be utilized. Using these various procedures to ensure a streamlined and efficient permitting system delivers another key commitment in government's March 1995 KBLUP decision.

In the early stages of exploration, activities cover a very extensive land base and usually involve minimal impacts to other resources. Advanced exploration and development activities may result in impacts to other resource values. However, such impacts are concentrated on a small area, often over a relatively short period of time. In such circumstances, all resource users and managers equally share the responsibility of accommodating the work. Permits for this work will address mitigation of the short-term impacts, and ensure long-term reclamation.

The resource value maps and guidelines in this strategy are available to explorationists to identify site-specific management concerns in advance of planning work and submitting permit applications. The permitting and approval processes for subsurface resource activities administered by the Ministry of Energy and Mines (MEM) will also identify these concerns through well-established inter-agency referral processes. MEM decision makers will consider the sensitive values and associated guidelines, and apply appropriate approval/permit conditions.

MEM will provide up-to-date subsurface resource information to other agencies during landscape level planning and in response to routine referrals for land use proposals (for example, *Land Act* applications for commercial recreation tenures). This information will be provided to ensure that subsequent land-use decisions do not unduly restrict subsurface resource activities, and maintain consistency with the government's March 1995 KBLUP decision and these recommendations.

B. 3.12.2 Spatial Application of the Guidelines

These guidelines apply to all Crown land outside of parks and protected areas.

In the Revelstoke planning area the following resource values are considered sensitive, and require consideration in preparing and assessing permit applications for subsurface resource activities:

- high and intermediate biodiversity emphasis areas;
- defined riparian management areas in Bigmouth Creek, Goldstream Creek, Downie Creek and Akolkolex River; and riparian areas required on other streams;
- defined high quality caribou habitat;
- critical habitat areas for grizzly bears;
- water quality in defined fish bearing streams;
- defined critical winter range habitat for listed ungulates (deer, elk, sheep, moose);
- Class 1 viewscapes; and
- domestic or community watersheds.

Subsurface resource exploration and development activities are allowed in areas with these values. Exploration and development activities may, however, require specific permit conditions to mitigate adverse impacts.

In areas with these values, access for exploration activities will conform with the *Access Management Guidelines Section 3.10* and may involve the use of enhanced referrals (defined in *Section 3.10.3*) and permitting conditions. Small no-staking reserves (for minerals) may be considered for some sensitive sites. These sites will be identified through local level strategic planning and will involve MEM and full industry consultation.

In the remaining area**,** the permit application review processes described in the Operational Guidelines (below) will be utilized.

B. 3.12.3 Operational Guidelines

All applications for exploration and development projects will be dealt with in a timely and efficient manner. The objective of the various permitting processes is to determine appropriate permit conditions under which the project will be carried out. All relevant information in government's March 1995 KBLUP decision and these recommendations will be used in the permitting review process.

Various statutory multi-agency review procedures apply to subsurface resource projects which seek to identify and mitigate impacts and ensure reclamation of disturbed sites. In the case of mineral and coal projects, these include Mines Act permit applications, whether through the Notice of Work referral process or the South Central Mine Development Review Committee. Site-specific Mines Act permit conditions, including appropriate reclamation security, together with inspections by MEM staff and, when appropriate by staff of other agencies, will ensure appropriate management of mineral or coal exploration and development.

The following are hypothetical examples of site-specific measures to mitigate impacts to the above-listed sensitive values:

- High and intermediate biodiversity emphasis areas:
  Plan and implement mineral exploration in old growth management areas (OGMAs) so that the fewest number of trees are felled. In the event that mineral development results in significant removal of the OGMA, a replacement will be located or, if necessary, recruited.
- Riparian management areas:
  Utilize the setbacks for exploration activities specified in the *Mineral Exploration Code*. Keep forest openings for drill sites, trenches, bulk sample sites and camps to the minimum size necessary. Where practicable, avoid extensive new exploration access roads.
- Defined caribou habitat:
  Ensure that intensive mechanized exploration is conducted in a way that does not disturb the reproductive habits of caribou (e.g., avoid areas and times for rutting, calving and nursing).
- Critical habitat areas for grizzly bears:
  Incorporate grizzly bear habitat management practices identified by the Ministry of Environment for critical areas (defined in the *Grizzly Bear Management Guidelines, Section 3.3* including areas such as avalanche chutes and riparian areas), and for access management.
- Water quality in fish-bearing streams:
  Incorporate in-stream work window guidelines and conform to the federal Fisheries Act.
- Defined critical ungulate winter range:
  Conduct intensive mechanized activities in a way that limits disturbance to over-wintering herds.
- Class 1 viewscapes:
  Keep forest openings for drill sites, trenches, bulk sample sites and camps to the minimum size necessary. Consider established points of view when designing the layout of mine developments. Use topographic breaks, berms and trees to screen disturbances.
- Domestic or community watersheds:
  Conduct exploration activities in manner that minimizes impacts to water quality, quantity and timing of flow. (Note: provisions of the *Mineral Exploration Code* are sufficient for activities in community watersheds. For domestic watersheds use the *Watershed Management Guidelines, Section 3.6*).

In general, timber harvesting deferrals do not apply to incidental timber harvesting for the purpose of subsurface resource exploration and development. Tree cutting that is authorized by

mining legislation (e.g., claim staking under the *Mineral Tenure Act*; line cutting under the *Mineral Exploration Code*) continues to be exempt from these Guidelines.

An enhanced referral (see *Section 3.10.3*) may be utilized for activities proposed to occur at sensitive sites. Specifically for access-related activities proposed for such areas, the *Access Management Guidelines Section 3.10* outline the referral process. An enhanced referral may involve some combination of: wider than normal range of referees; public notification and consultation; pre-approval site inspections; and an expectation that enhanced mitigation measures may be required. In the case of proposals for new road access in sensitive areas, the enhanced referral may involve a regional committee of technical experts from appropriate government agencies.

In the case of major new mines, or major expansions of existing mining operations, which exceed thresholds defined in the Reviewable Projects Regulation, the Environmental Assessment Office process will be applied, prior to projects proceeding to the permitting stage.

For subsurface energy resources, the Oil and Gas/Geothermal Tenure Review Process and Activity Referral Process will be utilized. The Environmental Assessment Office process applies to processing facilities and pipelines under Provincial jurisdiction that exceed the threshold defined in the Reviewable Projects Regulation.

Chapter B Resource Management

Section 4. Landscape Unit Objectives and Strategies

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This section includes detailed information about the resource values and recommended management practices for the Revelstoke area.

B. 4.1 Landscape Unit Boundaries

In the CORE process, the entire Kootenay-Boundary region was divided into CORE polygons to create areas of land with similiar resource values to facilitate definition of resource management objectives for the landbase. The Negotiating Committee refined the CORE polygons for their work. The Advisory Committee used the revised polygon boundaries for much of its work. In the later stages of the process it was clear that landscape units, which usually follow defined geographic drainages, would be the next planning level, so the polygon information was recompiled for landscape unit areas.

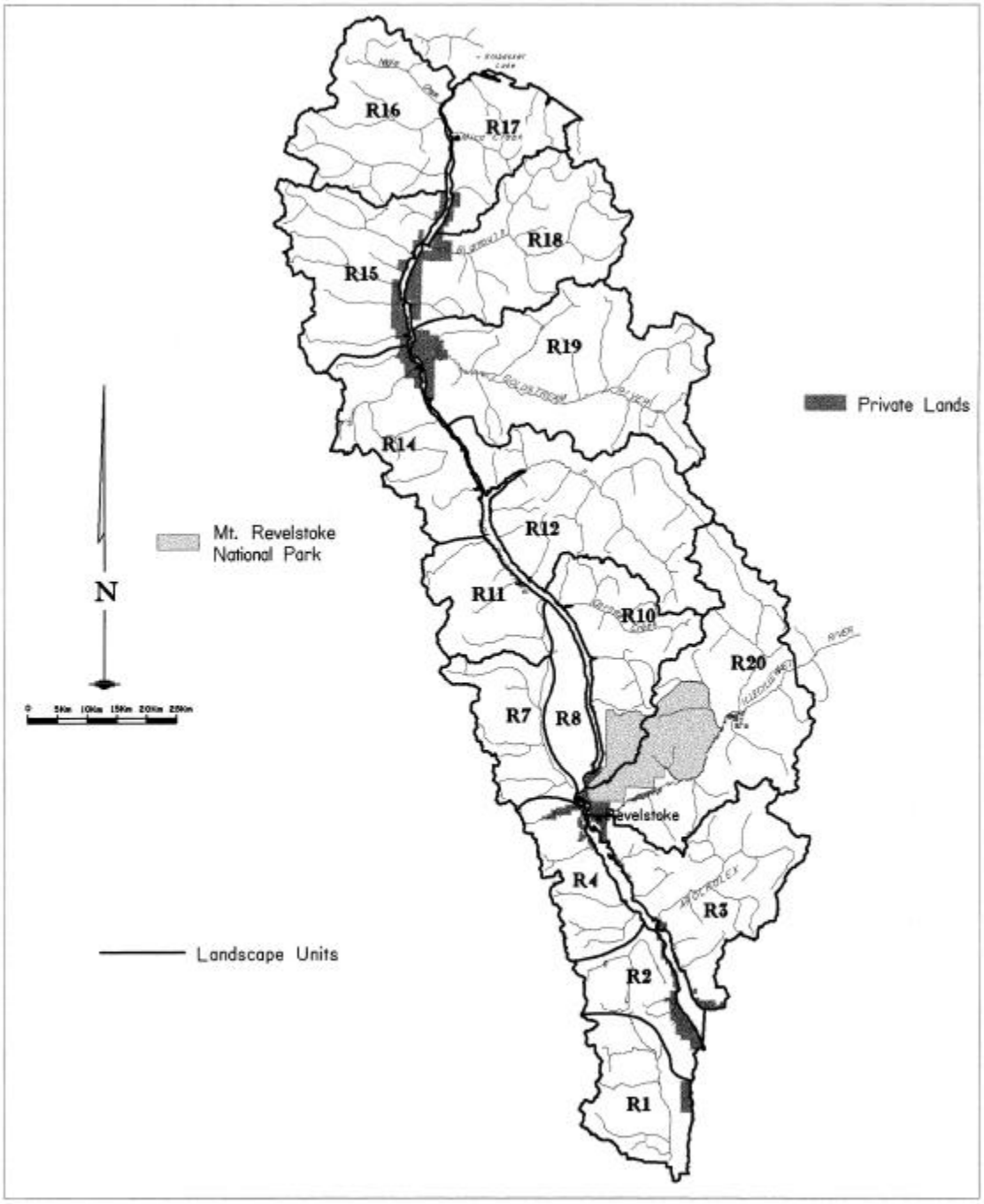
Map B8. shows the location and boundaries of each landscape unit. A more detailed map is available from the Columbia Forest District (250 837-7611)

B. 4.2 Landscape Unit Information

The following information is provided for each landscape unit:

- total area and forested area on Crown land
- general description of the location of the landscape unit
- description of the resource values in the area including:
  - in the left column, the source of the value notations indicating where enhanced management is required for non-industrial values and where key commercial values are located. The following abbreviations are used:
    - CORE indicates the value was identified during the CORE process
    - LOCAL indicates it was identified by the Negotiating Committee
    - H indicates high commercial value for the associated resource
    - M indicates moderate commercial value for the associated resource
  - a brief description of the resources such as the area of habitat, types of use, tenures, etc. Note that if a resource is not listed in the landscape unit values this indicates there has not been any identification of this resource or indication that it is significant in the unit.
- resource management objectives and strategies for each value which apply to the particular landscape unit in addition to the general direction and guidelines

Note: The numbers of hectares included in this section are estimates based on currently available inventory information. These will be refined and finalized for landscape unit planning.



Map B8. Landscape Unit Locations and Boundaries

B. 4.3 Landscape Unit Values, Objectives and Strategies

Landscape Unit R1 (Odin/Pingston Creeks)

Note: Northern landscape unit boundary to be refined for final landscape unit planning.

Total area: 34,792 hectares Forested area: 17,089 hectares

Location - West of the Columbia River including Pingston Creek, Odin Creek and Ledge Creek drainages

Values

Source	Value description
LOCAL	• **General biodiversity**: Natural Disturbance Type 1 at higher elevations and Type 2 at lower elevations; regional biodiversity corridor along the west shore of the Columbia River
LOCAL	• **Fisheries**: Pingston Creek - rainbow trout, kokanee; Columbia River/Arrow Lake - rainbow trout, bull trout, kokanee, white sturgeon, mountain whitefish
CORE	• **Mountain caribou**: approximately 15 – 20 animals from the Monashee range use Mount Hall in late winter; increased snowmobiling on Mount Hall may potentially reduce the habitat quality in this area
	• **Ungulates**: 3,728 hectares of critical winter range, primarily used by deer, along the Columbia River
CORE/ LOCAL	• **Grizzlies/wide-ranging carnivores**: grizzly bears, black bears, cougars, lynx, wolverine, marten, mink, otters and fishers
CORE	• **Recreation**: Arrow Lakes, Paint Lake and Pingston Lake trails; upland mountainous areas activities include high quality mountaineering, skiing in a remote area, with access to Monashee Park, hiking, snowmobiling, ATV use, hunting, horseback riding, canoeing, fishing and boating; identified alpine values
	• **Commercial tourism** (H):heli-skiing and scenic air tours (Canadian Mountain Holidays); canoeing (Grizzly Tours)
CORE	• **Viewscapes**: viewed from Highway 23 South, Shelter Bay and Galena Bay Ferry
	• **Timber** (H): 11,303 hectares operable area; substantial past harvesting under TFL 23 now owned by Pope and Talbot, Small Business Forest Enterprise Program operating area; small area of timber licenses held by Riverside; areas outside biodiversity corridors and ungulate winter range are candidates for intensive management
	• **Minerals** (M-H): documented metallic and industrial mineral occurrences, including the Big Ledge silver-lead-zinc deposit; some tenures; geology has good economic potential

Landscape Unit R1 (Odin/Pingston Creeks) (continued)

Objectives	Strategies
General biodiversity 1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.1 Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2*. . 1.2 Low biodiversity emphasis for the remainder of the area.
2. Maintain the regional connectivity corridor along the Columbia River to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal For further information see *Resource Management - General Direction and Guidelines*	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2*. 2.2 Connectivity between the Columbia and Arrow Forest Districts will be addressed in the landscape unit planning process.
Fisheries 1. Maintain existing fish stocks and habitat for fish species in Pingston Creek and its tributaries See *Resource Management - General Direction and Guidelines*	1.1 Develop hydrological stability assessment procedures then assessments of all fish-bearing streams in the Pingston drainage to identify hydrological stability thresholds. Development along these streams will occur within the limits of hydrological stability. 1.2 Avoid development that degrades the water quality in the other streams to the level that fish habitat is negatively impacted.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population For further information see *Resource Management – General Direction and Guidelines*	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Monitor motorized winter recreation use on Mount Hall and, if necessary, develop and implement a winter recreation plan similar to the plan for Frisby Ridge for the critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. Restrict motorized winter recreation use in upslope caribou habitat. 1.3 Development is to be consistent with strategies for the Monashee portion of this herd's range.

Landscape Unit R1 (Odin/Pingston Creeks) (continued)

Objectives	Strategies
Ungulates	
1. Maintain adequate critical winter range to maintain viable populations of mule deer, elk, moose, and white-tail deer, in this order of priority	1.1 Apply Ungulate Winter Range Guidelines to critical deer-leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4.* 1.2 Refine mapping of critical winter range areas.
For further information see *Resource Management - General Direction and Guidelines*	
Grizzlies/wide-ranging carnivores	
1. Minimize bear/human interactions at recreation sites	1.1 Reduce bear attractants at recreation sites.
2. Maintain sufficient seasonal bear habitat to achieve population target levels	2.1 Apply Grizzly Bear Management Guidelines in *Resource Management Guidelines section 3*.
3. Maintain viable cougar population	3.1 Maintain ungulate prey species. 3.2 Maintain sport harvest within sustainable levels.
For further information see *Resource Management - General Direction and Guidelines*	
Recreation	
1. Maintain a range of recreation settings, features and facilities	1.1 Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Upland alpine and sub-alpine areas to provide semi-primitive non-motorized experience. 1.3 Pingston Lake to continue as a walk-in lake. Trail to Pingston Lake to be maintained. .
For further information see *Resource Management - General Direction and Guidelines*	

Landscape Unit R1 (Odin/Pingston Creeks) (continued)

Objectives	Strategies
Heritage See *Resource Management - General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activity, logging and mining development on Crown land For further information see *Resource Management - General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development.
Viewscapes 1. Design of timber harvesting, forest management and mineral exploration is to reflect the importance of the visual quality of areas visible from designated viewpoints on Highway 23 South For further information see *Resource Management - General Direction and Guidelines*	1.1 Apply the Frontcountry Visual Management Guidelines as indicated on Map 5 in *Resource Management Guidelines section 7* to meet Class 3 objectives for areas visible from designated viewpoints on Highway 23 South. 1.2 Designate scenic areas as indicated on Map 5 in *Resource Management Guidelines section 7* as Known Scenic Areas under the Forest Practices Code. 1.3 Examine opportunities for rehabilitation cutting to meet viewscape management objectives, and implement where feasible.
Timber See *Resource Management - General Direction and Guidelines*	
Minerals See *Resource Management - General Direction and Guidelines*	

Landscape Unit R2 (Cranberry Creek/Gold Range)

Note: Landscape unit boundary to be refined for final landscape unit planning.

Total area: 23,234 hectares Forested area: 18,049 hectares

Location - West of the Columbia River from the Cranberry Creek drainage to just south of Shelter Bay including Coursier Lake. Highway 23 South passes through the area to the ferry terminal at Shelter Bay.

Values

Source	Value description
CORE/ LOCAL	• **General biodiversity**: Natural Disturbance Type 1 at higher elevations and 2 at lower elevations; regional biodiversity corridor along the west shore of the Columbia River
LOCAL	• **Fisheries**: Columbia River/Arrow Lake - rainbow trout, bull trout, kokanee, white sturgeon, mountain whitefish
CORE/ LOCAL	• **Mountain caribou**: approximately 15 - 20 animals from the Monashee range use the area along the divide and on Mount Hall in late winter; increased snowmobiling on Mount Hall may potentially reduce the habitat quality in this area
	• **Ungulates**: 6,435 hectares of critical winter range, primarily used by deer, along the Columbia River
CORE/ LOCAL	• **Grizzlies/wide-ranging carnivores**: grizzly bears, black bears, cougars, lynx, wolverine, marten, mink, otter and fishers
	• **Water**: licensed domestic users near Shelter Bay
CORE	• **Recreation**: Arrow Lakes, Coursier Lake, Arrow Lake Provincial Park at Shelter Bay, Eagle Bay Recreation Site; upland mountainous areas activities include mountaineering, hiking, snowmobiling, horseback riding, canoeing, snowmobiling and ATV use, fishing and boating; identified alpine values
	• **Commercial tourism** (H):heli-skiing and scenic air tours (Canadian Mountain Holidays); canoeing (Grizzly Tours)
CORE	• **Viewscapes**: viewed from Highway 23 South Shelter Bay and Galena Bay Ferry
	• **Timber** (M-H): 15,461 hectares operable area; substantial past harvesting under TFL 23 now owned by Pope and Talbot, Small Business Forest Enterprise Program operating area; areas outside biodiversity corridors, caribou habitat and ungulate winter range are candidates for intensive management
	• **Minerals** (M): documented metallic and industrial mineral occurrences, including sub-economic uranium-thorium deposits; geology has good economic potential

Landscape Unit R2 (Cranberry Creek/Gold Range) (continued)

Objectives	Strategies
General biodiversity 1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.1 Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2* . 1.2 Low biodiversity emphasis for the remainder of the area.
2. Maintain the regional connectivity corridor along the Columbia River to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal For further information see *Resource Management - General Direction and Guidelines*	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2.*
Fisheries 1. Maintain existing fish stocks and habitat for fish species in small creeks draining into the Columbia River For further information see *Resource Management - General Direction and Guidelines*	1.1 Avoid development that degrades the water quality in the small streams to the level that fish habitat is negatively impacted. 1.2 Avoid disturbance to spawning and rearing areas in the small streams draining into the Columbia River.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population For further information see *Resource Management – General Direction and Guidelines*	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Monitor motorized winter recreation use on Mount Hall and, if necessary, develop and implement a winter recreation plan similar to the plan for Frisby Ridge for the critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. Restrict motorized winter recreation use in upslope caribou habitat. 1.3 Development is to be consistent with strategies for the Monashee portion of this herd's range.

Landscape Unit R2 (Cranberry Creek/Gold Range) (continued)

Objectives	Strategies
Ungulates 1. Maintain adequate critical winter range to maintain viable populations of mule deer, elk and white-tail deer, in this order of priority, For further information see *Resource Management – General Direction and Guidelines*	1.1 Apply Ungulate Winter Range Guidelines to critical deer-leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4.* 1.2 Refine mapping of critical winter range areas.
Grizzlies/wide-ranging carnivores 1. Minimize bear/human interactions at recreation sites 2. Maintain sufficient seasonal bear habitat to achieve population target levels 3. Maintain viable cougar populations outside of rural areas For further information see *Resource Management - General Direction and Guidelines*	1.1 Reduce bear attractants at recreation sites. 2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3)* to grizzly bear. 2.2 Minimize and mitigate impacts of transportation corridor. 3.1 Maintain ungulate prey species. 3.2 Maintain sport harvest within sustainable levels.
Water 1. Maintain water quality and quantity in creeks with licensed water users	1.1 When timber companies or the Ministry of Forests propose operations in watersheds with licensed users they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.2 Licensed water users will be notified by advertisement of opportunities to review forest development plans.
For further information see *Resource Management - General Direction and Guidelines*	

Landscape Unit R2 (Cranberry Creek/Gold Range) (continued)

Objectives	Strategies
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management - General Direction and Guidelines*	1.1 Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.1 Upland alpine and sub-alpine areas to provide semi-primitive non-motorized experience 1.2 Drive-in (4-wheel) access to continue to Coursier Lake. .
Heritage See *Resource Management - General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activity, logging and mining development on Crown land For further information see *Resource Management - General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development.
Viewscapes 1. Design of timber harvesting, forest management and mineral exploration is to reflect the importance of the visual quality of areas visible from designated viewpoints on Highway 23 South For further information see *Resource Management - General Direction and Guidelines*	1.2 Apply the Frontcountry Visual Management Guidelines as indicated on Map 5 in *Resource Management Guidelines section 7* to meet Class 3 objectives for areas visible from designated viewpoints on Highway 23 South. 1.3 Designate scenic areas as indicated on Map 5 in *Resource Management Guidelines section 7* as Known Scenic Areas under the Forest Practices Code. 1.4 Examine opportunities for rehabilitation cutting to meet viewscape management objectives and implement where feasible.

Landscape Unit R2 (Cranberry Creek/Gold Range) (continued)

Objectives	Strategies
Timber See *Resource Management - General Direction and Guidelines*	
Minerals See *Resource Management - General Direction and Guidelines*	
Settlement See *Resource Management - General Direction and Guidelines*	

Landscape Unit R3 (Mount Mackenzie/ Akolkolex)

Total area: 60,949 hectares Forested area: 32,717 hectares

Location - Mount Mackenzie and the area on the east side of the Columbia River including the Akolkolex, Drimmie, and Crawford drainages

Values

Source	Value description
LOCAL	• **General biodiversity**: Natural Disturbance Type 1 with Type 2 at lower elevations; regional biodiversity connectivity corridor along the Columbia River to Montana Creek; substantial wetlands known as the 'greenbelt' provide staging area for migratory birds and nesting area
LOCAL	• **Fisheries**: Columbia River/Arrow Lake - rainbow trout, bull trout, kokanee, white sturgeon, mountain whitefish; regionally significant: Akolkolex River - cutthroat trout; Pulley Creek/Holyk Creek/Stanford Creek (all tributaries to Akolkolex) - cutthroat trout; Drimmie Creek - rainbow trout, strain of large kokanee; Crawford Creek - bull trout
	• **Mountain caribou**: no documented current use
	• **Ungulates**: 8,138 hectares critical winter range, primarily used by deer, at low elevations along the Columbia River and in the Akolkolex drainage
CORE/ LOCAL	• **Grizzlies/wide-ranging carnivores**: grizzly bears, black bears, cougars, lynx, wolverine, marten, mink, otter and fishers; access in the Akolkolex drainage reduces the habitat quality in this area
	• **Water**: a number of licensed domestic water users
CORE	• **Recreation**: Upper Arrow Lakes and shoreline are heavily used by local residents; upland mountainous areas, Ghost Peak; Akolkolex River and Falls; Echo Lake; hiking and all types of skiing, mountaineering, hunting, fishing, cycling, snowmobiling, ATV use, mountain biking, bird watching, boating, fishing and canoeing; trails to McCrae Lake, Sproat Mt. Lookout, Mt. Cartier trail; identified alpine values
CORE	• **Heritage**: Mount Cartier trail and Forestry Lookout; Arrowhead Townsite, Columbia River
	• **Commercial tourism** (H): downhill ski hill (Powder Springs/Mt. MacKenzie), cat-skiing (Cat Powder Skiing), heli-skiing (Selkirk Tangiers south of the Akolkolex/Canadian Mountain Holidays north of the Akolkokex); fishing tours (Arrow Lakes)
CORE	• **Viewscapes**: portions viewed from Highway 1, the City of Revelstoke, Highway 23 South, and the Galena Bay Ferry
	• **Timber** (H-M): 20,294 hectares operable area; primarily Downie Timber operating area, with Bell Pole along the Columbia River south of Akolkolex, and Small Business Forest Enterprise Program along the river north of Akolkolex; one woodlot license at Drimmie Creek; areas outside biodiversity corridors and ungulate winter range are candidates for intensive management
	• **Minerals** (H): documented metallic and industrial mineral occurrences; some tenures; geology has good economic potential
	• **Grazing**: one hay permit and one grazing license

Landscape Unit R3 (Mount Mackenzie/Akolkolex) (continued)

Values (continued)

Source	Value description
	• **Settlement**: includes part of the City of Revelstoke and residential areas at the base of Mt. Mackenzie and along the Columbia River

Objectives	Strategies
General biodiversity	
1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.1 Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2.* 1.2 Low biodiversity emphasis for the remainder of area.
2. Maintain the regional connectivity corridor along the Columbia River to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2*. 2.2 Connectivity between the Columbia and Arrow Forest Districts will be addressed in the landscape unit planning process.
3. Increase water bird brood production and water bird use as migration stopover	3.1 Investigate habitat enhancement opportunities through cooperative agreements.
4. Increase habitat for cavity nesters and deciduous old-growth dependent species	4.1 List cottonwood as acceptable species in riparian areas. 4.2 Restore cottonwood presence within its historic range.
For further information see *Resource Management - General Direction and Guidelines*	

Landscape Unit R3 (Mount Mackenzie/Akolkolex) (continued)

Objectives	Strategies
Fisheries	
1. Maintain existing fish stocks and habitat for fish species in the Akolkolex River and its tributaries, as well as Drimmie and Crawford Creeks	1.1 Develop hydrological stability assessment procedures then conduct assessments of all fish-bearing streams in the Akolkolex and Drimmie drainages to identify hydrological stability thresholds. Development along these streams will occur within the limits of hydrological stability. 1.2 Avoid development that degrades the water quality in the other streams to the level that fish habitat is negatively impacted. 1.3 Avoid disturbance to spawning and rearing areas in the lower reaches and mouth of Drimmie Creek and other streams draining into the Columbia River. 1.4 Maintain marsh habitats along the Columbia River/Arrow Lakes.
For further information see *Resource Management - General Direction and Guidelines*	
Ungulates	
1. Maintain adequate critical winter range to maintain viable populations of mule deer, elk and white-tail deer, in this order of priority	1.1 Apply Ungulate Winter Range Guidelines to critical deer-leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4*. 1.2 Refine mapping of critical winter range areas.
For further information see *Resource Management - General Direction and Guidelines*	
Grizzlies/wide-ranging carnivores	
1. Minimize bear/human interactions in settled areas and at recreation sites	1.1 Develop and implement Local Bear Plan. 1.2 Reduce bear attractants.
2. Maintain sufficient seasonal bear habitat to achieve population target levels	2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*).
3. Minimize grizzly bear displacement from the Akolkolex drainage	3.1 Develop and implement Access Management Plans for the Akolkolex drainage. Spring and summer access will be restricted, if necessary, to achieve grizzly bear management objectives.

Landscape Unit R3 (Mount Mackenzie/Akolkolex) (continued)

Objectives	Strategies
Grizzlies/wide-ranging carnivores (continued) 4. Maintain viable cougar populations outside residential and rural areas For further information see *Resource Management - General Direction and Guidelines*	4.1 Maintain ungulate prey species. 4.2 Maintain sport harvest within sustainable levels.
Water 1. Maintain water quality and quantity in creeks with licensed water users For further information see *Resource Management - General Direction and Guidelines*	1.1 When timber companies or the Ministry of Forests propose operations in watersheds with licensed users they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.2 Licensed water users will be notified by advertisement of opportunities to review forest development plans.
Recreation 1. Maintain a range of recreation settings, features and facilities	1.1 Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Non-roaded upland alpine and sub-alpine areas to provide semi-primitive non-motorized summer experiences and semi-primitive motorized winter experiences 1.3 Continue restrictions on summer motorized use to protect alpine meadows in the Mt. MacKenzie area. 1.4 Mt. Cartier, McCrae Lake and Sproat Mtn. trails will be maintained as BC Forest Service trail systems 1.5 Backcountry campsite at McCrae Lake to be maintained and enhanced by the BC Forest Service 1.6 Echo Lake and Akolkolex Falls to continue as BC Forest Service day use recreation sites

Landscape Unit R3 (Mount Mackenzie/Akolkolex) (continued)

Objectives	Strategies
Recreation (continued) For further information see *Resource Management - General Direction and Guidelines*	
Heritage See *Resource Management - General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land For further information see *Resource Management - General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development.
Viewscapes 1. Design of timber harvesting, forest management and mineral exploration is to reflect the importance of the visual quality of areas visible from designated viewpoints on Highway 1 and Highway 23 South and within the City of Revelstoke For further information see *Resource Management - General Direction and Guidelines*	1.1 Apply the Frontcountry Visual Management Guidelines as indicated on Map 5 in *Resource Management Guidelines section 7* to meet Class 1 objectives for areas viewed from designated viewpoints on Highway 1 and within the City of Revelstoke and Class 3 objectives for areas viewed from designated viewpoints on Highway 23 South. 1.2 Designate scenic areas as indicated on Map 5 in *Resource Management Guidelines section 7* as Known Scenic Areas under the Forest Practices Code. 1.3 Examine the opportunities for rehabilitation cutting to meet viewscape management objectives and implement where feasible.
Timber See *Resource Management - General Direction and Guidelines*	
Minerals See *Resource Management - General Direction and Guidelines*	

Landscape Unit R3 (Mount Mackenzie/Akolkolex) (continued)

Objectives	Strategies
Grazing See *Resource Management – General Direction and Guidelines*	
Settlement 1. Maintain opportunities for settlement-oriented uses and expansion on Crown land within existing settlement areas and corridors 2. Recognize environmental, conservation and other land use and resource management objectives when making decisions on the allocation of Crown land for settlement purposes For further information see *Resource Management – General Direction and Guidelines*	1.1 Continue to make small parcels of suitable Crown land available for settlement-oriented purposes within the existing settlement corridor on Map 6 in the *Resource Management Guidelines section 11* when consistent with resource management objectives. 2.1 In considering proposals to allocate Crown land for settlement purposes, make efforts to direct dispositions into suitable areas away from regionally significant connectivity corridors and habitats, as determined through referrals to resource agencies. Settlement areas are to be in general conformance with approved, local level strategic land use plans.

Landscape Unit R4 (Blanket/Mulvehill/Gold Range)

Note: Landscape unit boundary to be refined for final landscape unit planning.

Total area: 28,704 hectares Forested area: 17,692 hectares

Location - West of the Columbia River from just north of Highway 1 south to the Blanket Creek drainage. Highway 23 South passes through the area, carrying on to the ferry terminal at Shelter Bay.

Values

Source	Value description
CORE/ LOCAL	• **General biodiversity**: Natural Disturbance Type 1 in upslope areas and Type 2 at lower elevations; regional biodiversity corridor along the west shores of the Columbia River
CORE/ LOCAL	• **Fisheries**: Columbia River/Arrow Lake - rainbow trout, bull trout, kokanee, white sturgeon, mountain whitefish; Tonkawatla (TumTum) Creek – yellow fin rainbow trout, bull trout, kokanee, brook trout
CORE/ LOCAL	• **Mountain caribou**: approximately 15 - 20 animals from the Monashee range use the area along the divide in late winter
	• **Ungulates**: 4,141hectares of critical winter range, primarily used by deer, along the Columbia River
CORE/ LOCAL	• **Grizzlies/wide-ranging carnivores**: grizzly bears, black bears, cougars, lynx, wolverine, marten, mink, otter and fishers
	• **Water**: Dolan Creek is Big Eddy community watershed; a number of licensed domestic users on other creeks
CORE	• **Recreation**: Arrow Lakes, Blanket Creek Class A Provincial Park; upland mountainous areas include Mt. Begbie, with trails on Mt.Begbie; Begbie Falls and associated trails, bluffs and canyons; Mount McPherson multi-use trails and Demonstration Forest; activities include skiing, mountaineering, sport climbing, camping, hiking, snowmobiling, ATV use, cycling, bird watching, canoeing, fishing and boating; identified alpine values; heavy use due to proximity to Revelstoke and highway access
CORE	• **Heritage**: Columbia River
	• **Commercial tourism** (H): extensive tourism operators including commercial canoeing businesses (Grizzly Tours), riverboating, fishing tours (Arrow Lakes), hiking and backcountry skiing lodge (Blanket Glacier Chalet), heli-skiing and base for scenic air tours (Canadian Mountain Holidays), trail rides (Nelles Ranch), lodge (Mulvehill Retreat), alpine mountaineering, guiding and heli-picnicking (Revelstoke Alpine Adventure Company), campgrounds and motels along Trans-Canada Highway; railroad
CORE	• **Viewscapes**: viewed from the City of Revelstoke, Highway 1, Highway 23 South and Blanket Creek Recreation Area; backcountry viewscapes from Blanket Glacier Lodge
	• **Timber** (M): 8,473 hectares operable area; substantial past harvesting; TFL 23 owned by Pope and Talbot, with Small Business Forest Enterprise Program operating area; Small Business Forest Enterprise Program operating area on Mt. Macpherson; Bell Pole area in Begbie Falls and Boulder Mountain; Pope and Talbot timber license south of Begbie Falls; possible woodlot license area; areas outside biodiversity corridors, caribou habitat and ungulate winter range are candidates for intensive management

Landscape Unit R4 (Blanket/Mulvehill/Gold Range) (continued)

Values (continued)

Source	Value description
	• **Minerals** (M)**:** documented metallic and industrial mineral occurrences including uranium and gemstone deposits, a producing stone quarry; and producing and potential gravel pits • **Settlement**:: part of the City of Revelstoke and some residences along Highway 23S

Objectives	Strategies
General biodiversity	
1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	*1.1* Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2.* 1.2 Low biodiversity emphasis for the remainder of the area.
2. Maintain the regional connectivity corridor along the Columbia River to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2.*
3. Increase habitat for cavity nesters and deciduous old-growth dependent species	3.1 List cottonwood as acceptable species in riparian areas. 3.2 Restore cottonwood presence within its historic range.
For further information see *Resource Management - General Direction and Guidelines*	
Fisheries	
1. Maintain existing fish stocks and habitat for fish species in Tonkawatla (TumTum) Creek, as well as Blanket, Mulvehill, Wells, and Begbie Creeks	1.1 Avoid development that degrades the water quality in these streams to the level that fish habitat is negatively impacted. 1.2 Avoid disturbance to spawning and rearing areas in the lower reaches of streams draining into the Columbia River. 1.3 Maintain marsh habitats along Lake Revelstoke.
For further information see *Resource Management - General Direction and Guidelines*	

Landscape Unit R4 (Blanket/Mulvehill/Gold Range) (continued)

Objectives	Strategies
Mountain caribou	
1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Restrict motorized winter recreation use in upslope caribou habitat. 1.3 Development is to be consistent with strategies for the Monashee portion of this herd's range.
For further information see *Resource Management – General Direction and Guidelines*	
Ungulates	
1. Maintain adequate critical winter range to maintain viable populations of mule deer,white-tail deer, in this order of priority,	1.1 Apply Ungulate Winter Range Guidelines to critical deer-leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4* 1.2 Refine mapping of critical winter range areas.
2. Achieve the objectives of the Begbie Falls Integrated Resources Plan	2.1 Recreation and timber development to be consistent with the ungulate requirements of the Begbie Falls Integrated Resources Plan.
For further information see *Resource Management - General Direction and Guidelines*	
Grizzlies/wide-ranging carnivores	
1. Minimize bear/human interactions in settled areas, at recreation sites and at the private lodges	1.1 Implement the Local Bear Plan. 1.2 Reduce bear attractants in settled areas and recreation sites. 1.3 Private lodge owners are encouraged to thoroughly incinerate or remove garbage from lodges regularly.
2. Maintain sufficient seasonal bear habitat to achieve population target levels	2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3)*. 2.2 Minimize and mitigate impacts of transportation corridor.

Landscape Unit R4 (Blanket/Mulvehill/Gold Range) (continued)

Objectives	Strategies
Grizzly bears/wide ranging carnivores (continued) 3. Maintain viable cougar populations outside of rural areas For further information see *Resource Management - General Direction and Guidelines*	3.1 Maintain ungulate prey species. 3.2 Maintain sport harvest within sustainable levels.
Water 1. Maintain water quality and quantity in Dolan Creek and creeks with licensed water users For further information see *Resource Management – General Direction and Guidelines*	1.1 Review and revise the Dolan Creek Integrated Watershed Management Plan to ensure consistency with the Code and the Community Watershed guidebook. 1.2 When timber companies or the Ministry of Forests propose operations in watersheds with licensed users they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.3 Licensed water users will be notified by advertisement of opportunities to review forest development plans.
Recreation 1. Maintain a range of recreation settings, features and facilities	1.1 Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Mt. MacPherson trails to provide all-season multi-activity use. Restrictions on some recreational activities may be required to reduce conflicts between recreation uses. 1.3 Mt. Begbie trail to be maintained by the BC Forest Service. 1.4 Mt. Begbie area (north of Mulvehill Creek) to be maintained for public recreation with no structures other than trail facilities. 1.5 Blanket Creek Provincial Park to continue as overnight and day use during the summer months.

Landscape Unit R4 (Blanket/Mulvehill/Gold Range) (continued)

Objectives	Strategies
Recreation (continued) 2. Achieve the objectives of the Begbie Falls Integrated Resources Plan For further information see *Resource Management - General Direction and Guidelines*	2.1 Recreation development to be consistent with the Begbie Falls Integrated Resources Plan. 2.2 Drive-in access to continue to Begbie Falls campsite and the area will be managed as a day use facility by the BC Forest Service.
Heritage See *Resource Management - General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activity, logging and mining development on Crown land For further information see *Resource Management - General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development.
Viewscapes 1. Design of timber harvesting, forest management and mineral exploration is to reflect the importance of the visual quality of areas visible from designated viewpoints on Highway 1 and Highway 23S, and within the City of Revelstoke For further information see *Resource Management - General Direction and Guidelines*	1.1 Apply the Frontcountry Visual Management Guidelines as indicated on Map 5 in *Resource Management Guidelines section 7* to meet Class 1 objectives for areas visible from designated viewpoints on Highway 1 and within the City of Revelstoke, and Class 3 objectives for areas visible from designated viewpoints on Highway 23 South. 1.2 Designate scenic areas as indicated on Map 5 in *Resource Management Guidelines section 7* as Known Scenic Areas under the Forest Practices Code. 1.3 Examine opportunities for rehabilitation cutting to meet viewscape management objectives and implement where feasible.

Landscape Unit R4 (Blanket/Mulvehill/Gold Range) (continued)

Objectives	Strategies
Timber 1. Achieve objectives of Begbie Falls Integrated Resources Plan See *Resource Management - General Direction and Guidelines*	1.1 Timber management is to be consistent with the Begbie Falls Integrated Resources Plan.
Minerals See *Resource Management – General Direction and Guidelines*	
Settlement 1. Maintain opportunities for settlement-oriented uses and expansion on Crown land within existing settlement areas and corridors 2. Recognize environmental, conservation and other land use and resource management objectives when making decisions on the allocation of Crown land for settlement purposes For further information see *Resource Management - General Direction and Guidelines*	1.1 Continue to make small parcels of suitable Crown land available for settlement-oriented purposes within the existing settlement corridor on map 6 in *Resource Management Guidelines section 11* when consistent with resource management objectives. 2.1 In considering proposals to allocate Crown land for settlement purposes, make efforts to direct dispositions into suitable areas away from regionally significant connectivity corridors and habitats, as determined through referrals to resource agencies. Settlement areas are to be in general conformance with approved, local level strategic land use plans.

Landscape Unit R7 (Jordan)

Note: Landscape unit boundary to be refined for final landscape unit planning.

Total area: 31,482 hectares | Forested area: 13,089 hectares

Location - North of Highway 1 to the height of land north of the Jordan River, west of Frisby Ridge to the boundary of the Columbia Forest District

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the Columbia River
CORE	· **Fisheries**: regionally significant fisheries: Jordan River and its tributaries provide spawning beds for Arrow Lakes fishery including rainbow trout, bull trout, cutthroat trout, kokanee; Copeland Creek - bull trout, cutthroat trout, rainbow trout; Kirkup Creek – cutthroat trout; Columbia River - rainbow trout, bull trout, kokanee, white sturgeon
	• **Mountain caribou**: approximately 50 animals range through small area of primary habitat in this area, as well as Frisby Ridge and Big Eddy; historical range includes Kirkup, Hiren and Boulder Mountain area; increased snowmobiling may potentially reduce habitat quality
	• **Ungulates**: 836 hectares critical winter range primarily used by deer, and 1763 hectares critical winter range primarily used by moose, along the Jordan River
CORE	· **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverine, marten and fishers
	• **Water**: licensed domestic users along Westside Road
CORE	· **Recreation:** upland mountainous areas and meadows, Jordan River, hiking, mountain biking, horseback riding, mountaineering, snowmobiling (including hut), backcountry skiing, whitewater canoeing/kayaking and other river recreation; identified alpine values
	• **Heritage**: Big Eddy in Columbia River and Revelstoke Power Station which is now underwater, Copeland mine
	• **Commercial tourism** (H): poor weather heli-skiing area (Canadian Mountain Holidays), guide outfitters (Monashee Big Game Outfitters); applications submitted for commercial snowmobile tenures (Peaks Snowmobile Tours, Revelstoke Snowmobile Tours, Great Canadian Snowmobile Tours), Highway 1; railroad
CORE	· **Viewscapes:** visible from Highway 1, and the City of Revelstoke
	• **Timber harvesting** (H): 3,147 hectares operable area; primarily Downie Timber operating area with small Bell Pole area at south end; Kirkup Creek is a candidate area for intensive management
	• **Minerals** (H): several documented metallic and industrial mineral occurrences including the past producer Copeland Mine; several tenures
	• **Settlement:** Big Eddy area of the City of Revelstoke and potential development areas

Landscape Unit R7 (Jordan) (continued)

Objectives	Strategies
General biodiversity	
1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.1 High and intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2*. 1.2 Low biodiversity emphasis throughout the area.
2. Maintain the regional connectivity corridor along the west side of Lake Revelstoke to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through high biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2*.
For further information see *Resource Management - General Direction and Guidelines*	
Fisheries	
1. Maintain existing fish stocks and habitat for fish species in the Jordan River and its tributaries	1.1 Develop hydrological stability assessment procedures then conduct assessments of all fish-bearing streams in the Jordan River system to identify hydrological stability thresholds. Development along these streams will occur within the limits of hydrological stability. 1.2 Avoid disturbance to spawning and rearing areas in the lower reaches and mouth of the Jordan River.
For further information see *Resource Management - General Direction and Guidelines*	
Mountain caribou	
1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*.
2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	2.1 Commercial Backcountry Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5*. 2.2 Develop winter recreation plan which defines acceptable snowmobile use (time of year, trail location, type of users), similar to the plan for Frisby Ridge. Access will be restricted, if necessary, to achieve caribou management objectives.

Landscape Unit R7 (Jordan) (continued)

Objectives	Strategies
Mountain caribou (continued) 3. Maintain balanced predator/prey relationship in critical caribou habitat	3.1 Monitor cougar and wolf population levels in critical caribou habitat.
For further information see *Resource Management - General Direction and Guidelines*	
Ungulates 1. Maintain adequate critical winter range to maintain a viable population of mule deer, 2. Maintain adequate critical winter range to maintain a viable population of moose For further information see *Resource Management - General Direction and Guidelines*	1.1 Apply Ungulate Winter Range Guidelines to deer leading critical winter range areas identified on Map 3 in *Resource Management Guidelines section 4*. 2.1 Apply Ungulate Winter Range Guidelines to moose leading critical winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.
Grizzlies/wide-ranging carnivores 1. Minimize conflicts with grizzly and black bears at recreation sites 2. Maintain sufficient seasonal bear habitat to achieve population target levels For further information see *Resource Management - General Direction and Guidelines*	1.1 Store garbage at informal recreation sites securely so it is not accessible to bears. 2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*).
Water 1. Maintain water quality and quantity in creeks with licensed water users For further information see *Resource Management - General Direction and Guidelines*	1.1 When timber companies or the Ministry of Forests propose operations in watersheds with licensed users they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.2 Licensed water users will be notified by advertisement of opportunities to review forest development plans.

Landscape Unit R7 (Jordan) (continued)

Objectives	Strategies
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management - General Direction and Guidelines*	1.1 Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories.
Heritage See *Resource Management - General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activity, logging and mining development on Crown land See *Resource Management - General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development.
Viewscapes 1. Design of timber harvesting, forest management and mineral exploration is to reflect the importance of the visual quality of areas visible from designated viewpoints on Highway 1 and within the City of Revelstoke For further information see *Resource Management - General Direction and Guidelines*	1.1 Apply the Frontcountry Visual Management Guidelines as indicated on Map 5 in *Resource Management Guidelines section 7* to meet Class 1 objectives for areas viewed from designated viewpoints on Highway 1 and within the City of Revelstoke. 1.2 Designate scenic areas as indicated on Map 5 in *Resource Management Guidelines section 7* as Known Scenic Areas under the Forest Practices Code. 1.3 Examine the opportunities for rehabilitation cutting to meet viewscape management objectives and implement where feasible.
Timber harvesting See *Resource Management – General Direction and Guidelines*	

Landscape Unit R7 (Jordan) (continued)

Minerals See *Resource Management - General Direction and Guidelines*	
Settlement 1. Maintain opportunities for settlement-oriented uses and expansion on Crown land within existing settlement areas and corridors 2. Recognize environmental, conservation and other land use and resource management objectives when making decisions on the allocation of Crown land for settlement purposes For further information see *Resource Management - General Direction and Guidelines*	1.1 Continue to make small parcels of suitable Crown land available for settlement-oriented purposes within the existing settlement corridor on map 6 in *Resource Management Guidelines section 11* when consistent with resource management objectives. 2.1 in considering proposals to allocate Crown land for settlement purposes, make efforts to direct dispositions into suitable areas away from regionally significant connectivity corridors and habitats, as determined through referrals to resource agencies. Settlement areas are to be in general conformance with approved, local level strategic land use plans.

Landscape Unit R8 (Frisby)

Note: Landscape unit boundary to be refined for final landscape unit planning.

Total area: 16,835 hectares | Forested area: 13,465 hectares

Location - Frisby Ridge west of Lake Revelstoke and north of the City of Revelstoke

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the west side of Lake Revelstoke
	• **Fisheries:** Columbia River/Lake Revelstoke - white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish
CORE	• **Mountain caribou**: approximately 50 animals range in this area, Jordan and Big Eddy; historical range includes Kirkup, Hiren and Boulder Mountain area; extensive snowmobiling use of this area potentially reduces the quality of this habitat
CORE	• **Ungulates**: 1,336 hectares of critical winter range used primarily by deer at the south end of the area, and 3,052 hectares of critical winter range used primarily by moose along Lake Revelstoke
CORE	• **Grizzlies/wide-ranging carnivores**: grizzly bears, black bears, cougars, lynx, wolverine, marten and fishers; unrestricted access on the east-side of Frisby Ridge reduces the habitat quality
	• **Water**: a number of licensed users
CORE	• **Recreation**: Frisby Ridge, snowmobiling and hut, hunting, berry picking; identified alpine values
	• **Heritage**: Little Dallas Canyon, Revelstoke Dam, Columbia River
	• **Commercial tourism** (H): heli-skiing (Canadian Mountain Holidays), snowmobiling (Revelstoke Snowmobile Tours/Peaks Snowmobile Tours, Great Canadian Snowmobile Tours), guide outfitting (Monashee Big Game Outfitters)
CORE	• **Viewscapes**: visible from Highway 1, the City of Revelstoke, Mt. Revelstoke National Park and Martha Creek Provincial Park
	• **Timber harvesting** (H): 4,853 hectares operable area; primarily Small Business Forest Enterprise Program operating area with small Bell Pole area in southwest corner
	• **Minerals** (M): a few documented metallic mineral deposits; geology has good economic potential

Landscape Unit R8 (Frisby) (continued)

Objectives	Strategies
General biodiversity	
1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.1 High biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2*. 1.2 Low biodiversity emphasis for the remainder of the area.
2. Maintain the regional connectivity corridor along the west side of Lake Revelstoke to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through high biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2*.
For further information see *Resource Management – General Direction and Guidelines*	
Fisheries	
1. Maintain existing fish stocks and habitat for fish species in the small streams draining into Lake Revelstoke	1.1 Avoid development that degrades the water quality in these streams to the level that fish habitat is negatively impacted. 1.2 Avoid disturbance to spawning and rearing areas in the lower reaches and mouth of streams draining into Lake Revelstoke. 1.3 Maintain marsh habitats along Lake Revelstoke.
For further information see *Resource Management - General Direction and Guidelines*	
Mountain caribou	
1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Intermediate biodiversity emphasis to be applied in remaining caribou habitat identified on Map 4 in *Resource Management Guidelines section 5*.
2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	2.1 Commercial Backcountry Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5*. 2.2 Continue and monitor the effectiveness of the access plan currently in place for snowmobiling on Frisby Ridge.
3. Maintain balanced predator/prey relationship in critical caribou habitat	3.1 Monitor cougar and wolf population levels in critical caribou habitat.

Landscape Unit R8 (Frisby) (continued)

Objectives	Strategies
Mountain caribou (continued) For further information see *Resource Management - General Direction and Guidelines*	
Ungulates	
1. Maintain adequate critical winter range to maintain viable populations of mule deer, elk and white-tail deer, in this order of priority	1.1 Apply Ungulate Winter Range Guidelines to deer leading critical winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.
2. Maintain adequate critical winter range to maintain a viable population of moose	2.1 Apply Ungulate Winter Range Guidelines to moose leading critical winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.
For further information see *Resource Management - General Direction and Guidelines*	
Grizzlies/wide ranging carnivores	
1. Minimize conflicts with grizzly and black bears at recreation sites	1.1 Store garbage at informal recreation sites securely so it is not accessible to bears.
2. Maintain sufficient seasonal bear habitat to achieve population target levels	2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*).
3. Minimize grizzly bear displacement from this area	3.1 Develop and implement an Access Management Plan for the eastside of Frisby Ridge which is accessible by ferry only. Access will be restricted to commercial users only to achieve grizzly bear management objectives.
For further information see *Resource Management - General Direction and Guidelines*	
Water	
1. Maintain water quality and quantity in creeks with licensed water users	1.1 When timber companies or the Ministry of Forests propose operations in watersheds with licensed users they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.2 Licensed water users will be notified by advertisement of opportunities to review forest development plans.

Landscape Unit R8 (Frisby) (continued)

Objectives	Strategies
Water (continued) For further information see *Resource Management - General Direction and Guidelines*	
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management - General Direction and Guidelines*	1.1 Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Update and implement the for recreation and commercial tourism on Lake Revelstoke.
Heritage See *Resource Management - General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activity, logging and mining development on Crown land See *Resource Management - General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Viewscapes 1. Design of timber harvesting, forest management and mineral exploration is to reflect the importance of the visual quality of areas visible from designated viewpoints on Highway 1 and within the City of Revelstoke	1.1 Apply the Frontcountry Visual Management Guidelines as indicated on Map 5 in *Resource Management Guidelines section 7* to meet Class 1 objectives for areas viewed from designated viewpoints on Highway 1 and within the City of Revelstoke. 1.2 Designate scenic areas as indicated on Map 5 in *Resource Management Guidelines section 7* as Known Scenic Areas under the Forest Practices Code. 1.3 Examine the opportunities for rehabilitation cutting to meet viewscape management objectives and implement when feasible.

Landscape Unit R8 (Frisby) (continued)

Objectives	Strategies
Viewscapes (continued) For further information see *Resource Management – General Direction and Guidelines*	
Timber harvesting See *Resource Management – General Direction and Guidelines*	
Minerals See *Resource Management – General Direction and Guidelines*	
Settlement See *Resource Management – General Direction and Guidelines*	

Landscape Unit R10 (LaForme/Carnes)

Total area: 46,421hectares Forested area: 23,172 hectares

Location – All drainages into Lake Revelstoke/Columbia River on the east side from slightly north of Revelstoke northward south of the Mars Creek drainage, including Martha, Laforme and Carnes Creek drainages

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the east side of Lake Revelstoke
CORE/ LOCAL	• **Fisheries**: Carnes Creek – kokanee, bull trout, mountain white fish, rainbow trout; LaForme Creek – bull trout, rainbow trout, kokanee; Lake Revelstoke – white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish
CORE	• **Mountain caribou**: approximately 100 animals range from the Columbia River east to Glacier National Park and from Highway 1 north to Carnes Creek and the Tangiers drainage; increased snowmobiling use on Sale Mountain will potentially reduce the quality of this habitatl
CORE	• **Ungulates**: 3,267 hectares critical winter range, primarily used by deer along Lake Revelstoke; restricted access in Carnes Creek for mountain goats
CORE	• **Grizzlies/wide-ranging carnivores**: grizzly bears, black bears, cougars, lynx, wolverines, marten and fishers; unrestricted access in Carnes Creek reduces the grizzly bear habitat quality
	• **Water**: a number of licensed users
CORE	• **Recreation**: Sale Mountain hut; upland mountainous areas and meadows, mountaineering, skiing, hunting, mountain biking, berry picking and snowmobiling; identified alpine values; lakeshore recreation on Lake Revelstoke including Carnes Creek and 5 Mile recreation sites and Martha Creek Provincial Park
CORE	• **Heritage:** Mastodon, Carnes-Kelly-Burke trail, Columbia River, Revelstoke Dam
	• **Commercial tourism** (H): backcountry skiing and hiking lodge (Selkirk Mountain Experience Durrand Glacier Chalet), heli-skiing (Selkirk Tangiers), guide-outfitting (Selkirk Big Game Outfitters), bus tours (Martha Creek); viewpoint kiosk (Columbia View)
CORE	• **Viewscapes**: visible from Revelstoke Dam Columbia Viewpoint, Lake Revelstoke, Highway 23 North, Durrand Glacier Chalet
	• **Timber** (H): 9,931 hectares operable area; Joe Kozek Sawmills operating area in Carnes Creek and Downie Timber area elsewhere, with small area of Revelstoke Community Forest Corporation TFL 56 in north; immature forests are candidate for intensive management outside biodiversity corridors, caribou habitat and ungulate winter range
	• **Minerals** (H-VH): numerous documented metallic and industrial mineral deposits, including some past producing mines (Mastodon, Carnes Creek placer gold); geology has good economic potential; some tenures

Landscape Unit R10 (LaForme/Carnes) (continued)

Objectives	Strategies
General biodiversity	
*1.1*Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.2Intermediate biodiversity emphasis for the area identified on Map 1 *in Resource Management Guidelines section 2*. 1.2 Low biodiversity emphasis for the remainder of the area.
2. Maintain the regional connectivity corridors along Lake Revelstoke to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2.*
For further information see *Resource Management – General Direction and Guidelines*	
Fisheries	
1. Maintain existing fish stocks and habitat for fish species in Carnes and LaForme Creeks, as well as small creeks draining into Lake Revelstoke	1.3Develop hydrological stability assessment procedures then conduct assessments of LaForme Creek and its tributaries to establish hydrological stability thresholds. Development along these streams will occur within the limits of hydrological stability. 1.4Avoid development that degrades the water quality in the other streams to the level that fish habitat is negatively impacted. 1.5Avoid disturbance to spawning areas in the lower reaches and mouths of these streams. 1.6Maintain marsh habitats along Lake Revelstoke.
For further information see *Resource Management – General Direction and Guidelines*	
Mountain caribou	
1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5.*

Landscape Unit R10 (LaForme/Carnes) (continued)

Objectives	Strategies
Mountain caribou (continued)	
2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	*1.7*Commercial Backcountry Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5.* 1.8Monitor winter recreation use on the Sale Mountain Area and, if necessary, develop and implement a winter recreation plan which defines acceptable snowmobile use (time of year, trail location, type of users), similar to the plan for Frisby Ridge. Access will be restricted, if necessary, to achieve caribou management objectives.
3. Discourage cougar presence in critical caribou habitat	3.1 Monitor cougar population levels in critical caribou habitat. 3.2 Encourage hunter harvest of cougars in critical caribou habitat.
For further information see *Resource Management – General Direction and Guidelines*	
Ungulates	
1. Maintain adequate critical winter range to maintain viable populations of mule deer, moose and white-tail deer, in this order of priority	*1.9*Apply Ungulate Winter Range Guidelines to critical deer-leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4.*
2. Minimize disturbance to mountain goats in Carnes Creek.	2.1 Develop and implement an Access Management Plan for Carnes Creek. Access will be restricted, if necessary, to achieve mountain goat management objectives. 2.2 Minimize and mitigate impacts of transportation corridor.
For further information see *Resource Management – General Direction and Guidelines*	
Grizzlies/wide-ranging carnivores	
1. Minimize conflicts between humans and grizzly or black bears at recreation facilities	1.1 Store garbage at Martha Creek and other informal campsites securely so it is not accessible to bears.
2. Maintain sufficient seasonal bear habitat to achieve population target levels	2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*).
3. Minimize grizzly bear displacement from Carnes Creek	3.1 Develop and implement an Access Management Plan for Carnes Creek. Access will be restricted, if necessary, to achieve grizzly bear management objectives.

Landscape Unit R10 (LaForme/Carnes) (continued)

Objectives	Strategies
Grizzlies/wide-ranging carnivores (continued) For further information see *Resource Management – General Direction and Guidelines*	
Water 1.10Maintain water quality and quantity in creeks with licensed water users For further information see *Resource Management – General Direction and Guidelines*	1.11When timber companies or the Ministry of Forests propose operations in watersheds with licensed users they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.12Licensed water users will be notified by advertisement of opportunities to review forest development plans.
Recreation 1. Maintain a range of recreation settings, features and facilities 2. Restrict road access adjacent to National Parks boundaries For further information *see Resource Management – General Direction and Guidelines*	1.13Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8),* primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.14BC Parks to continue to maintain Martha Creek Provincial Park for overnight and day use during summer season. 1.15Martha Creek trail is to be maintained by the BC Forest Service. 1.16Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke. 2.1 Develop and implement recreation oriented access management strategies for boundary areas (ie. Sale Mtn. Snowmobile area) considering all users and caribou habitat requirements. 2.2 Park boundaries are to be visibly signed.

Landscape Unit R10 (LaForme/Carnes) (continued)

Objectives	Strategies
Heritage See *Resource Management – General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activity, logging and mining development on Crown land For further information see *Resource Management – General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber See *Resource Management – General Direction and Guidelines*	
Minerals See *Resource Management – General Direction and Guidelines*	
Settlement See *Resource Management – General Direction and Guidelines*	

Landscape Unit R11 (Big Eddy)

Total area: 31,430 hectares Forested area: 9,691 hectares

Location – From Frisby Creek north to the height of land south of Seymour Creek, from the western boundary of the Columbia Forest District to Frisby Creek and Lake Revelstoke

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the west shore of Lake Revelstoke
CORE	• **Fisheries**: Frisby Creek – sculpin (genetically isolated), kokanee, rainbow trout, bull trout; Big Eddy Creek – bull trout, mountain white fish, cutthroat trout, rainbow trout, kokanee; Lake Revelstoke – white sturgeon, rainbow trout, bull trout, kokanee, mountain white fish
	• **Mountain caribou**: approximately 50 animals range through habitat along Lake Revelstoke in this area, as well as habitat in the Frisby Ridge and Jordan areas; habitat along Lake Revelstoke connects Frisby herd with the main population in the north
	• **Ungulates**: 1,752 hectares critical moose winter range along Lake Revelstoke
CORE	· **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverine, marten and fishers; unrestricted access will potentially reduce the habitat quality for grizzly bears
CORE	· **Recreation**: upland mountainous areas and lake shore of Lake Revelstoke, lake shore recreation, mountaineering, backcountry skiing, snowmobiling; identified alpine values
	• **Commercial tourism** (H): heli-skiing (Canadian Mountain Holidays in the south/Selkirk Tangiers in the north); guide outfitters (Monashee Big Game Outfitters)
CORE	· **Viewscapes:** visible from Lake Revelstoke, Highway 23 North, Keystone hut
	• **Timber harvesting** (H): 2,313 hectares operable area; Downie Timber operating area excepting Small Business Forest Enterprise Program along the edge of Lake Revelstoke
	· **Minerals** (H): two documented industrial mineral occurrences; geology has good economic potential

Objectives	Strategies
General biodiversity	
1.17Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.18High biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2*. 1.2 Low biodiversity emphasis for the remainder of area.

Landscape Unit R11 (Big Eddy) (continued)

Objectives	Strategies
General biodiversity (continued) 2. Maintain the regional connectivity corridors along Lake Revelstoke to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal For further information see *Resource Management – General Direction and Guidelines*	2.1 Connectivity function to be achieved through high biodiversity emphasis and connectivity guidelines along the connectivity corridors identified on Map 1 in *Resource Management Guidelines section 2*.
Fisheries 1. Maintain existing fish stocks and habitat for fish species in Frisby and Big Eddy Creeks as well as the smaller creeks draining into Lake Revelstoke For further information see *Resource Management – General Direction and Guidelines*	1.19Avoid development that degrades the water quality in these streams to the level that fish habitat is negatively impacted. 1.20Avoid disturbance to spawning and rearing areas in the lower reaches and mouths of these streams. 1.3 Maintain marsh habitats along Lake Revelstoke.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population 2. Maintain balanced predator/prey relationship in critical caribou habitat For further information see *Resource Management – General Direction and Guidelines*	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 *Resource Management Guidelines section 5*. 1.21Monitor cougar and wolf population levels in critical caribou habitat.
Ungulates 1. Maintain adequate critical winter range to maintain a viable population of moose For further information see *Resource Management – General Direction and Guidelines*	1.1 Apply Ungulate Winter Range Guidelines to critical moose – leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.

Landscape Unit R11 (Big Eddy) (continued)

Objectives	Strategies
Grizzlies/wide-ranging carnivores 1. Maintain sufficient seasonal bear habitat to achieve population target levels 1.23Minimize grizzly bear displacement from this area For further information see *Resource Management – General Direction and Guidelines*	1.22Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*). 2.1 Develop and implement an Access Management Plan for the area. Access will be restricted to commercial users only to achieve grizzly bear management objectives.
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines*	1.24Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land For further information see *Resource Management – General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber harvesting See *Resource Management – General Direction and Guidelines*	

Landscape Unit R11 (Big Eddy) (continued)

Objectives	Strategies
Minerals See *Resource Management – General Direction and Guidelines*	

Landscape Unit R12 (Downie/Sorcerer Creeks and Keystone/ Standard Basin)

Total area: 80,956 hectares Forested area: 47,691 hectares

Location – The Mars, Downie and Sorcerer Creek drainages, and Keystone/Standard area

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the east shore of Lake Revelstoke, the length of Downie Creek and along Sorcerer Creek to Tangiers and Gold Rivers and Batchelor Creek; local connectivity to Pettipiece Pass; major riparian values in Downie Creek drainage
CORE	• **Fisheries**: Downie Creek has critical spawning areas for kokanee, cutthroat and rainbow trout/Downie Arm has highly productive, critical fish habitat, including sturgeon, kokanee, bull trout, rainbow trout and mountain whitefish, which contribute to the Lake Revelstoke fishery; Lake Revelstoke – white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish; Sorcerer Creek – bull trout; Standard Creek – rainbow trout, bull trout, kokanee
CORE/ LOCAL	• **Mountain caribou**: approximately 40 animals range from the Columbia River east into the Downie/Sorcerer drainage and the Keystone area; increased snowmobiling in the Keystone/Standard area may potentially reduce the habitat quality
CORE	• **Ungulates**: 1,548 hectares critical deer winter range along Lake Revelstoke south of Downie Loop, and 6,098 hectares of critical moose winter range north of Downie Loop along Lake Revelstoke as well as Downie and Sorcerer Creeks
CORE	• **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverines, marten and fishers; unrestricted access potentially reduces habitat quality
	• **Water**: domestic water license for Downie RV Park
CORE	• **Recreation**: lakeshore recreation on Lake Revelstoke; Keystone Standard Basin alpine and sub alpine meadows complex and cabin; Downie Undeveloped Lands; upland mountainous areas, Downie Creek, Downie Arm, mountaineering, hiking, backcountry skiing, snowmobiling, ATV use, mountain biking, berry picking, hunting and river recreation including canoeing and kayaking; identified alpine values
CORE	• **Heritage**: Columbia River; Standard Group; Keystone Group Lode Gold Mines, two Ktunaxa/Kinbasket archeological sites (EiQo –1 and EiQo-2)
	• **Commercial tourism** (H): guide outfitter camp (Selkirk Big Game Outfitters), heli-skiing (Selkirk Tangiers); commercial campground and recreational vehicle park/ snowmobiling operation (Downie RV Park); backcountry ski touring and hut (Selkirk Mountain Experience)
CORE	• **Viewscapes:** viewed from Downie RV Park, Highway 23 North and Lake Revelstoke

Landscape Unit R12 (Downie/Sorcerer Creeks and Keystone/Standard Basin) (continued)

Values (continued)

Source	Value description
	• **Timber** (H): 14,690 hectares operable area; Revelstoke Community Forest Corporation TFL 56 with very small sliver of Joe Kozek Sawmills operating area in southern portion of Keystone/Standard Basin and top of Tangiers drainage; Pass and Nightmare/Daydream Creeks are candidates for intensive management • **Minerals** (H): several documented metallic and industrial mineral occurrences; placer gold potential; several tenures; geology has good economic potential

Objectives	Strategies
General biodiversity	
1.25Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	*1.26*Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2.* 1.1 Low biodiversity emphasis for the remainder of area.
1.27Maintain the regional connectivity corridors along Lake Revelstoke as well as Downie and Sorcerer Creeks to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridors identified on Map 1 in *Resource Management Guidelines section 2.*
3. Retain riparian and wet land values	3.1 Implement Forest Practices Code riparian protection provisions.
4. Minimize disturbance to wildlife, habitat damage and wildlife harvest concentration	4.1 Continue vehicle access hunting closure on Downie Road.
For further information see *Resource Management – General Direction and Guidelines*	

Landscape Unit R12 (Downie/Sorcerer Creeks and Keystone/Standard Basin) (continued)

Objectives	Strategies
Fisheries 1.28Maintain existing fish stocks and habitat for fish species in Downie Creek and its tributaries, Sorcerer Creek, Standard Creek and small creeks draining into Lake Revelstoke For further information see *Resource Management – General Direction and Guidelines*	1.29Develop hydrological stability assessment procedures then conduct assessments of Downie Creek and its tributaries to establish hydrological stability thresholds. Development along these streams will occur within the limits of hydrological stability. 1.30Avoid development that degrades the water quality in these streams to the level that fish habitat is negatively impacted. 1.31Avoid disturbance to spawning areas in the lower reaches and mouth of streams draining into Lake Revelstoke. 1.32Maintain marsh habitats along Lake Revelstoke.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population 2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	*1.33*Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5.* *1.34*Intermediate biodiversity emphasis to be applied to the remainder of caribou habitat identified on Map 4 in *Resource Management Guidelines section 5.* 2.1 Commercial Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5.* 2.2 The Keystone-Standard Local Resource Use Plan is to include a winter recreation plan including restrictions which define acceptable snowmobile use (time of year, trail location, type of users), similar to the plan for Frisby Ridge. Access will be restricted, if necessary, to achieve caribou management objectives. 2.3 Develop and implement a winter access management plan which defines acceptable snowmobile use (time of year, trail location, type of users, number of users, enforcement and monitoring approaches) for the south end of Caribou Basin/Ridge. Access will be restricted from the south end of the basin, if necessary, to achieve caribou management objectives. Access will be restricted from the northern portion of the area to achieve caribou management objectives.

Landscape Unit R12 (Downie/Sorcerer Creeks and Keystone/Standard Basin) (continued)

Objectives	Strategies
Mountain caribou (continued) 3. Discourage cougar presence in critical caribou habitat For further information see *Resource Management – General Direction and Guidelines*	 3.1 Monitor cougar and wolf population levels in critical caribou habitat. 3.2 Encourage hunter harvest of cougars in critical caribou habitat .
Ungulates 1. Maintain adequate critical winter range to maintain viable populations of mule deer, elk, and white-tail deer, in this order of priority 2.Maintain adequate critical winter range to maintain a viable population of moose For further information see *Resource Management – General Direction and Guidelines*	 *1.35*Apply Ungulate Winter Range Guidelines to critical deer-leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4.* 2.1 Apply Ungulate Winter Range Guidelines to critical moose leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4.*
Grizzlies/wide-ranging carnivores 1.36Minimize human conflicts with grizzly and black bears at recreation facilities 2. Maintain sufficient seasonal bear habitat to achieve population target levels 1.39Minimize grizzly bear displacement from the Downie and Sorcerer drainages	 1.37Store garbage at informal recreation sites and Keystone Cabin securely so it is not accessible to bears. *1.38*Private recreation site owner is encouraged to store garbage at Downie Loop commercial facility securely so it is not accessible to bears. . 2.1 Apply Grizzly Bear Management Guidelines *(Resource Management Guidelines section 3*). 2.2 Minimize and mitigate impacts of transportation corridor . 3.1 Develop and implement Access Management Plans for the Downie River and Sorcerer Creek drainages. Summer access will be restricted, if necessary, to achieve grizzly bear management objectives.

Landscape Unit R12 (Downie/Sorcerer Creeks and Keystone/Standard Basin) (continued)

Objectives	Strategies
Grizzlies/wide-ranging carnivores (continued) For further information see *Resource Management – General Direction and Guidelines*	
Water 1.40Maintain water quality and quantity in creeks with licensed water users For further information see *Resource Management – General Direction and Guidelines*	1.41When timber companies or the Ministry of Forests propose operations in watersheds with licensed users they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.42Licensed water users will be notified by advertisement of opportunities to review forest development plans.
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines*	1.43Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines *(Resource Management Guidelines section 8),* primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.44Implement the Keystone/Standard Basin Local Resource Use Plan to address activity conflicts and recreation management issues. 1.45Keystone Standard Basin trail is to be maintained by the BC Forest Service. 1.46Restrictions for summer motorized use are to be maintained. 1.47Implement road deactivation prescriptions for road networks that are not designated for Keystone-Standard Basin recreational access. *1.48*Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke*.*

Landscape Unit R12 (Downie/Sorcerer Creeks and Keystone/Standard Basin) (continued)

Objectives	Strategies
Heritage See *Resource Management – General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Commercial tourism (continued) See *Resource Management – General Direction and Guidelines*	
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber 1.49Minimize conflicts with caribou management and recreation use in the Keystone/Standard Basin area For further information see *Resource Management – General Direction and Guidelines*	1.1 Implement timber harvesting consistent with the Keystone/Standard Basin Local Resource Use Plan.
Minerals See *Resource Management – General Direction and Guidelines*	
Settlement See *Resource Management – General Direction and Guidelines*	

Landscape Unit R14 (Fissure/Liberty Creeks)

Total area: 44,433 hectares Forested area: 25,423 hectares

Location – West side of Lake Revelstoke, from the Seymour Creek drainage in the south to Sibley Creek drainage in the north, bordered on the west by the western boundary of the Columbia Forest District; including Kirbyville/Liberty/Fissure/Forty-nine Creek drainages

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the west side of Lake Revelstoke and through Kirbyville Lakes and Seymour River to the Perry/Shuswap Rivers
CORE/ LOCAL	• **Fisheries**: Lake Revelstoke – white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish; Seymour / Fissure Creeks – rainbow trout, kokanee, bull trout; Kirbyville Creek – rainbow trout, bull trout, kokanee, sculpin
CORE/ LOCAL	• **Mountain caribou**: approximately 200 caribou range through high quality primary habitat in this area as well as Nicholls, Liberty, Hoskins, Caribou Ridge and Lower Goldstream; connectivity to the west and northwest populations provided through Kirbyville Lakes and Pettipiece Pass; large area of young forest in Managed Tree Farm is not currently suitable habitat; unrestricted access and snowmobiling reduces habitat quality
CORE	• **Ungulates**: 6,063 hectares critical moose winter range along Lake Revelstoke and up Kirbeyville Creek
CORE	· **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverine, marten and fishers; unrestricted access may potentially reduce habitat quality
CORE	· **Recreation:** lakeshore recreation on Lake Revelstoke; upland mountainous areas, Kirbyville Lakes, Pettipiece Pass, mountaineering, snowmobiling; hunting; fishing; identified alpine values
CORE	· **Heritage**: Seymour Pass, Pettipiece Pass (not in original inventory); Kirbyville Placer Creek
	• **Commercial tourism** (H): heli-skiing (Canadian Mountain Holidays); guide outfitting (Monashee Big Game Outfitters); snowmobiling (Downie RV Park)
CORE	• **Viewscapes**: visible from Lake Revelstoke, Downie RV Park and Highway 23 North
	· **Timber harvesting** (H): 10,971 hectares operable area; Downie Timber operating area; area of private Managed Tree Farm along west side of Lake Revelstoke at northern end
	• **Minerals** (M): several documented metallic and industrial mineral occurrences; some tenures; geology has good economic potential

Landscape Unit R14 (Fissure/Liberty Creeks) (continued)

Objectives	Strategies
General biodiversity 1.50Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level 2. Maintain the regional connectivity corridor along the west side of Lake Revelstoke, through Kirbyville Lakes and along Seymour Creek to the Perry and Seymour Rivers to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal For further information see *Resource Management – General Direction and Guidelines*	*1.51*High and intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 1.* 1.52Low biodiversity emphasis for the remainder of the area. 2.1 Connectivity function to be achieved through high and intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 *Resource* Management *Guidelines section 2*.
Fisheries 1. Maintain existing fish stocks and habitat for fish species in Fissure, Seymour, and Kirbyville Creeks as well as the smaller streams and creeks draining into Lake Revelstoke For further information see *Resource Management – General Direction and Guidelines*	1.53Avoid development that degrades the water quality in streams to the level that fish habitat is negatively impacted. 1.54Avoid disturbance to spawning areas in streams draining into Lake Revelstoke. 1.3 Maintain marsh habitats along Lake Revelstoke.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.55Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Improve information on caribou habitat use in this area.

Landscape Unit R14 (Fissure/Liberty Creeks) (continued)

Objectives	Strategies
Mountain caribou (continued)	
2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	1.56Commercial Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5*. 2.2 Public road access will not be permitted through Pettipiece Pass or Kirbyville Pass/Kirbyville Lakes. Industrial roads will be gated. 2.3 Develop and implement a winter recreation plan which defines a snowmobile access route from the west-side to Bourne Glacier. Access will be restricted elsewhere to achieve caribou management objectives.
3. Maintain balanced predator/prey relationship in critical caribou habitat For further information see *Resource Management – General Direction and Guidelines*	3.1 Monitor cougar and wolf population levels in critical caribou habitat.
Ungulates	
1. Maintain adequate critical winter range to maintain a viable moose population For further information see *Resource Management – General Direction and Guidelines*	1.57Apply Ungulate Winter Range Guidelines to critical moose – leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.
Grizzlies/wide-ranging carnivores	
1. Maintain sufficient seasonal bear habitat to achieve population target levels	1.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*).
1.58Minimize grizzly bear displacement from this area For further information see *Resource Management – General Direction and Guidelines*	2.1 Develop and implement an Access Management Plan for this area. Access will be restricted to commercial users to achieve grizzly bear management objectives.

Landscape Unit R14 (Fissure/Liberty Creeks) (continued)

Objectives	Strategies
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines*	1.59Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.60Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke. 1.61Kirbyville Lakes are to provide semi-primitive non-motorized experiences. No permanent roads to be built within 1 kilometer of the lakes. Road deactivation is required after resource development.
Heritage See *Resource Management – General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land See *Resource Management – General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Viewcapes See *Resource Management – General Direction and Guidelines*	
Timber harvesting 1. No development on the unstable areas of the Downie Slide For further information see *Resource Management – General Direction and Guidelines*	1.62Downie Slide development moratorium is to be continued. Any development must take into account existing instrumentation and highly unstable slopes 1.2 Monitoring of slide movement should be continued.

Landscape Unit R14 (Fissure/Liberty Creeks) (continued)

Objectives	Strategies
Minerals See *Resource Management – General Direction and Guidelines*	

Landscape Unit R15 (Hoskins/Horne/Scrip Creeks)

Total area: 55,653hectares Forested area: 21,082 hectares

Location – Hoskins, Horne and Scrip Creek drainages from Lake Revelstoke to the height of land

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the west side of Lake Revelstoke connecting to Kinbasket Lake in the northeast and Kirbyville in the southwest, as well as along Scrip Creek
CORE/ LOCAL	• **Fisheries**: Lake Revelstoke – white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish; Ruddock Creek – bull trout, kokanee; Hoskins Creek – bull trout, rainbow trout, sculpin, kokanee; Scrip Creek – rainbow trout, kokanee, bull trout; Horne Creek – rainbow trout, mountain whitefish, kokanee
CORE/ LOCAL	• **Mountain caribou**: approximately 100 caribou range through primary habitat along Lake Revelstoke; ; large area of young forest in Managed Tree Farm is not currently suitable habitat;
	• **Ungulates**: 5,027 hectares critical moose winter range along Lake Revelstoke and up Scrip Creek
CORE	· **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverine, marten and fishers; unrestricted access limits habitat quality
CORE	· **Recreation**: lakeshore of Lake Revelstoke; fishing; upland mountainous areas; hunting; identified alpine values
CORE	• **Heritage**: trails and cabins from Big Bend Gold Rush
	• **Commercial tourism** (H): heli-skiing (Canadian Mountain Holidays), guide outfitting camp (Monashee Big Game Outfitters)
CORE	· **Viewscapes:** visible from Lake Revelstoke and Highway 23 North
	• **Timber harvesting** (H): 5,383 hectares operable area; Downie Timber operating; large area of private land in Managed Tree Farm along the lakeshore*;* candidates for intensive management outside biodiversity corridors, caribou habitat and ungulate winter range
	· **Minerals** (M):one documented mineral occurrence; an important deposit (Ruddock Creek) lies immediately west; geology is poorly known; some recent staking

Landscape Unit R15 (Hoskins/Horne/Scrip Creeks) (continued)

Objectives	Strategies
General biodiversity	
1.63 Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.64High and Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2*. 1.65Low biodiversity emphasis for the remainder of the area.
2. Maintain the regional connectivity corridor along Lake Revelstoke to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines on the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2*.
For further information see *Resource Management – General Direction and Guidelines*	
Fisheries	
1. Maintain existing fish stocks and habitat for fish species in Hoskins Creek, Ruddock Creek, Scrip Creek, Horne Creek and the smaller streams draining into Lake Revelstoke	1.66Avoid development that degrades the water quality in these streams to the level that fish habitat is negatively impacted. 1.67Avoid disturbance to spawning areas in streams draining into Lake Revelstoke. 1.3 Maintain marsh habitats along Lake Revelstoke.
For further information see *Resource Management – General Direction and Guidelines*	
Mountain caribou	
1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.68Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 *Resource Management Guidelines section 5*. 1.2 Improve information on caribou habitat use in this area.
2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	1.69Commercial Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 *Resource Management Guidelines section 5*.
3. Maintain balanced predator/prey relationship in critical caribou habitat	3.1 Monitor cougar and wolf population levels in critical caribou habitat.

Landscape Unit R15 (Hoskins/Horne/Scrip Creeks) (continued)

Objectives	Strategies
Mountain caribou (continued) For further information see *Resource Management – General Direction and Guidelines*	
Ungulates 1. Maintain adequate critical winter range to maintain a viable moose population For further information see *Resource Management – General Direction and Guidelines*	1.70Apply Ungulate Winter Range Guidelines to critical moose – leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.
Grizzlies/wide-ranging carnivores 1. Minimize human conflicts with grizzly and black bears at the guide outfitter camp 2. Maintain sufficient seasonal bear habitat to achieve population target levels 3. Minimize grizzly bear displacement from the west-side of Lake Revelstoke For further information see *Resource Management – General Direction and Guidelines*	1.1 Private lodge owners are encouraged to thoroughly incinerate or remove garbage from the lodge regularly. 2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*). 3.1 Develop and implement an Access Management Plan for the west-side of Lake Revelstoke. Access will be restricted to commercial users only to achieve grizzly bear management objectives.
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines*	1.71Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.

Landscape Unit R15 (Hoskins/Horne/Scrip Creeks) (continued)

Objectives	Strategies
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land See *Resource Management – General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber harvesting See *Resource Management – General Direction and Guidelines*	
Minerals See *Resource Management – General Direction and Guidelines*	

Landscape Unit R16 (Nagle/Soards/Pat Creeks)

Total area: 57,322 hectares Forested area: 26,845 hectares

Location – Nagle, Soards and Pat Creek drainages from Lake Revelstoke to the height of land

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along the western shore of Lake Revelstoke as well as north across the low pass at Pat Creek
CORE	• **Fisheries**: Pat Creek – rainbow trout, kokanee, bull trout; Soards Creek – bull trout, rainbow trout, kokanee; Nagle Creek – sculpin, rainbow trout, bull trout; Lake Revelstoke – white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish
CORE	• **Mountain caribou**: approximately 100 animals range through a small area of primary habitat in this area as well as east through the valley bottoms to Bigmouth and Mica Creeks
	• **Ungulates**: 3,709 hectares critical moose winter range along Lake Revelstoke and up Pat, Nagle and Soards Creeks
CORE	· **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverine, marten and fishers; unrestricted access limits habitat quality
	· **Recreation**: lakeshore of Lake Revelstoke, fishing, upland mountainous areas; dispersed recreation; identified alpine values
CORE	· **Heritage**: trails and cabins from Big Bend Gold Rush
	• **Commercial tourism** (H): heli-skiing (Canadian Mountain Holidays); guide outfitting (Monashee Big Game Outfitters)
CORE	· **Viewscapes:** viewed from Lake Revelstoke, Mica Creek townsite and Highway 23 North
	• **Timber harvesting** (H)**:** 9,116 hectares operable area; Downie Timber operating area in the south and Small Business Forest Enterprise Program operating area in the north; candidate for intensive management on front face excepting Dutchman Ridge where stability concerns exist due to the Mica Dam, as well as Pat and Soards Creeks
	· **Minerals** (L): no documented mineral occurrences geology appears to be unfavourable, but is very poorly known

Landscape Unit R16 (Nagle/Soards/Pat Creeks) (continued)

Objectives	Strategies
General biodiversity 1.72Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level For further information see *Resource Management – General Direction and Guidelines*	*1.73*High and intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2.* 1.74Low biodiversity emphasis for the remainder of the area.
Fisheries 1. Maintain existing fish stocks and habitat for fish species in Soards, Nagle and Pat Creeks and the smaller creeks draining into Lake Revelstoke For further information see *Resource Management – General Direction and Guidelines*	1.75Avoid development that degrades the water quality in Soards, Nagle, and Pat Creeks to the level that fish habitat is negatively impacted. 1.76Avoid disturbance to spawning areas in the streams draining into Lake Revelstoke 1.77Maintain marsh habitats along Lake Revelstoke.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population 2. Minimize caribou disturbance from recreation activities in areas designated for caribou management 3. Maintain balanced predator/prey relationship in critical caribou habitat For further information see *Resource Management – General Direction and Guidelines*	1.78Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Improve information on caribou habitat use in this area. 2.1 Commercial Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 *Resource Management Guidelines Section 5.* 3.1 Monitor cougar and wolf population levels in critical caribou habitat.

Landscape Unit R16 (Nagle/Soards/Pat Creeks) (continued)

Objectives	Strategies
Ungulates 1. Maintain adequate critical winter range to maintain a viable moose population For further information see *Resource Management – General Direction and Guidelines*	1.1 Apply Ungulate Winter Range Guidelines to critical moose – leading winter range areas identified on Map 3 *Resource Management Guidelines section 4*.
Grizzlies/wide-ranging carnivores 1. Maintain sufficient seasonal bear habitat to achieve population target levels 1.80Minimize grizzly bear displacement from this area For further information see *Resource Management – General Direction and Guidelines*	1.79Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*). 2.1 Develop and implement an Access Management Plan for the area that is only accessible by ferry. Access will be restricted to commercial users to achieve grizzly bear management objectives.
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines* **Heritage** See *Resource Management – General Direction and Guidelines*	1.81Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land See *Resource Management – General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.

Landscape Unit R16 (Nagle/Soards/Pat Creeks) (continued)

Objectives	Strategies
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber harvesting 1. No development on the unstable areas of the Dutchman Slide northwest of the dam For further information see *Resource Management – General Direction and Guidelines*	1.82Dutchman Slide development moratorium is to be continued. Any development must take into account existing instrumentation and highly unstable slopes 1.2 Monitoring of slide movement should be continued.
Minerals See *Resource Management – General Direction and Guidelines*	

Landscape Unit R17 (Mica Creek)

Total area: 33,944 hectares Forested area: 19,441 hectares

Location –East of Lake Revelstoke from Mica Creek drainage north to Kinbasket Lake

Values

Source	Value description
CORE/ LOCAL	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along Lake Revelstoke and Kinbasket Lake; ecological reserve at Goose Grass Creek to the east of this landscape unit
CORE/ LOCAL	• **Fisheries**: Lake Revelstoke – white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish; Mica Creek – high value kokanee spawning stream as well as bull trout, rainbow trout, mountain white fish; Birch Creek/ Kinbasket Creek – kokanee, bull trout, sculpin; Pitt Creek – bull trout, rainbow trout, kokanee, sculpin; Yellow Creek – bull trout
CORE/ LOCAL	• **Mountain caribou**: approximately 100 animals range from Scrip and Soards creeks in the west to Bigmouth and Mica creeks; increased snowmobiling may reduce the habitat quality in Fred Laing ridge area
	• **Ungulates**: 3,660 hectares critical moose winter range along Lake Revelstoke and Kinbasket Lake
CORE	• **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverines, marten and fishers
	• **Water**: domestic water license for the Mica Creek townsite
CORE	• **Recreation**: lakeshore of Lake Revelstoke; Sprague Bay and Potlatch Creek Recreation Sites; upland mountainous areas and meadows; Fred Laing Ridge trail; the lake shore of Lake Kinbasket; camping, fishing, hunting and hiking; identified alpine values
CORE	• **Heritage**: Mica Dam; trails and cabins from Big Bend Gold Rush; David Thompson route
	• **Commercial tourism** (H): heli-skiing lodge at Mica Creek (Canadian Mountain Holidays), heli-skiing, guide outfitting and camp (Monashee Big Game Outfitters); potential for tourist use of BC Hydro Hotel
CORE	• **Viewscapes:** viewed from Lake Revelstoke, Mica Dam, Mica townsite, Highway 23 North
	• **Timber** (H): 9,202 hectares operable area, Evans Forest Products TFL 55 in southern portions with Bell Pole and the Small Business Forest Enterprise Program areas along Kinbasket Lake; candidate for intensive management along Kinbasket Lake, outside of biodiversity corridor and ungulate winter range
	• **Minerals** (M): several documented industrial and metallic mineral occurrences; some tenures on boundary of plan area; geology is poorly known
	• **Settlement**: Mica Creek townsite

Landscape Unit R17 (Mica Creek) (continued)

Objectives	Strategies
General biodiversity 1.83Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level 2. Maintain the regional connectivity corridor along Lake Revelstoke and Kinbasket Lake to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal For further information see *Resource Management – General Direction and Guidelines*	1.84Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2*. 1.85Low biodiversity emphasis for the remainder of the area. 2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 *Resource Management Guidelines section 2*.
Fisheries 1. Maintain existing fish stocks and habitat for fish species in Mica, Pitt, Yellow and Birch/Kinbasket Creeks as well as the smaller creeks draining into Lake Revelstoke For further information see *Resource Management – General Direction and Guidelines*	1.86Avoid development that degrades the water quality in Mica, Pitt, Yellow and Birch/ Kinbasket Creeks to the level that fish habitat is negatively impacted. 1.87Avoid disturbance to spawning areas in the streams draining into Lake Revelstoke. 1.88Maintain marsh habitats along Lake Revelstoke.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.89Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Improve information on use of caribou habitat in this area

Landscape Unit R17 (Mica Creek) (continued)

Objectives	Strategies
Mountain caribou (continued)	
2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	1.90Commercial Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5*. 2.2 Monitor winter recreation use of the Mica Creek and Fred Laing Ridge area and, if necessary, develop and implement a winter recreation plan which defines acceptable snowmobile use (time of year, trail location, type of users), similar to the plan for Frisby Ridge. Access will be restricted, if necessary, to achieve caribou management objectives.
3. Maintain balanced predator/prey relationship in critical caribou habitat	3.1 Monitor cougar and wolf population levels in critical caribou habitat.
For further information see *Resource Management – General Direction and Guidelines*	
Ungulates	
1. Maintain adequate critical winter range to maintain a viable moose population	1.91Apply Ungulate Winter Range Guidelines to critical moose – leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.
For further information see *Resource Management – General Direction and Guidelines*	
Grizzlies/wide-ranging carnivores	
1. Minimize human conflicts with grizzly and black bears	1.1 Store garbage at the Mica townsite, lodge, and hunting camp so it is not accessible to bears.
2. Maintain sufficient seasonal bear habitat to achieve population target levels	2.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*). 2.2 Minimize and mitigate impacts of transportation corridor.
For further information see *Resource Management – General Direction and Guidelines*	

Landscape Unit R17 (Mica Creek) (continued)

Objectives	Strategies
Water 1.92Maintain water quality and quantity in creeks with licensed water users For further information see *Resource Management – General Direction and Guidelines*	1.93When timber companies or the Ministry of Forests propose operations in watersheds with licensed users, they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.94Licensed water users will be notified by advertisement of opportunities to review forest development plans.
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines*	1.95Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.96Fred Laing Ridge trail to be maintained from BC Hydro microwave to Gorge Lake by BC Forest Service. 1.97Continue development of the campsite at Sprague Bay and maintain as BC Forest Service Recreation Site in conjunction with BC Hydro. 1.98Maintain Pitt Creek and Potlatch Creek as BC Forest Service Recreation Sites. 1.5 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Heritage See *Resource Management – General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of the commercial recreation tenure holder with logging and mining development on Crown land	1.1 The appropriate resource agencies will work with the tourism tenure holder to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.

Landscape Unit R17 (Mica Creek) (continued)

Objectives	Strategies
Commercial tourism (continued) For further information see *Resource Management – General Direction and Guidelines*	
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber See *Resource Management – General Direction and Guidelines*	
Minerals See *Resource Management – General Direction and Guidelines*	
Settlement 1. Maintain opportunities for settlement-oriented uses and expansion on Crown land within existing settlement areas and corridors 2. Recognize environmental, conservation and other land use and resource management objectives when making decisions on the allocation of Crown land for settlement purposes For further information see *Resource Management – General Direction and Guidelines*	1.1 Continue to make small parcels of suitable Crown land available for settlement-oriented purposes within the existing settlement corridor as identified on Map 6 in *Resource Management Guidelines section 11* when consistent with resource management objectives. 2.1 In considering proposals to allocate Crown land for settlement purposes, make efforts to direct dispositions into suitable areas away from regionally significant connectivity corridors and habitats, as determined through referrals to resource agencies. Settlement areas are to be in general conformance with approved, local level strategic land use plans.

Landscape Unit R18 (Bigmouth/Louis Lee Creeks)

Total area: 66,684 hectares Forested area: 32,551 hectares

Location – Bigmouth and Louis Lee Creek drainages, including plateau area between Old Camp Creek and Bigmouth Creek

Values

Source	Value description
CORE/ LOCAL	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridor along east side of Lake Revelstoke connecting to Kinbasket Lake, also along Bigmouth Creek to Louis Lee Creek; riparian areas at the mouth of Bigmouth Creek
CORE/ LOCAL	• **Fisheries**: Bigmouth Creek – kokanee, bull trout, mountain white fish, sculpin; tributaries to Bigmouth Creek are important bull trout producers; Louis Lee Creek/ Argonaut Creek – bull trout; Nicholls Creek – rainbow trout, bull trout and kokanee
CORE	• **Mountain caribou**: approximately 100 animals range from Scrip and Soards creeks in the west to Bigmouth and Mica creeks; large area of young forest at low elevation on Managed Tree Farm is not currently suitable habitat; increased snowmobiling use may potentially reduce habitat quality
	• **Ungulates**: 5,220 hectares critical moose winter range along Lake Revelstoke, Bigmouth and Louis Lee Creeks
CORE	• **Grizzlies/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverines, marten and fishers;unrestricted access limits habitat quality
CORE	• **Recreation**: upland mountainous areas, Bigmouth Creek, mountaineering, fishing, skiing and hunting; lakeshore of Lake Revelstoke; identified alpine values
CORE	• **Heritage**: trails and cabins from Big Bend Gold Rush
	• **Commercial tourism** (M):heli-skiing (Canadian Mountain Holidays), guide outfitting (Monashee Big Game Outfitters)
CORE	• **Viewscapes**: viewed from Lake Revelstoke and Highway 23 North
	• **Timber** (H): 13,713 hectares operable area; Small Business Forest Enterprise Program operating in the back drainages of Bigmouth Creek, Downie Timber areas in Louis Lee Creek and Evans Forest Products TFL 55 along the front face; extensively harvested private Managed Tree Farm along Lake Revelstoke; candidate for intensive management outside biodiversity corridor, caribou habitat and ungulate winter range
	• **Minerals** (L): one documented mineral occurrence (mica)
	• **Settlement**: Bigmouth airport

Landscape Unit R18 (Bigmouth/Louis Lee Creeks) (continued)

Objectives	Strategies
General biodiversity	
1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.99Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2.* 1.100Low biodiversity emphasis for the remainder of the area.
2. Maintain the regional connectivity corridor along Lake Revelstoke and in the riparian areas at the mouth of Bigmouth Creek to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through high and intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridors identified on Map 1 *Resource Management Guidelines section 2.*
For further information see *Resource Management – General Direction and Guidelines*	
Fisheries	
1. Maintain existing fish stocks and habitat for fish species in Bigmouth Creek, Nicholls Creek, tributaries to Bigmouth Creek and small streams draining into Lake Revelstoke	1.101Develop hydrological stability assessment procedures then conduct assessments of Bigmouth Creek and its tributaries to establish hydrological stability thresholds. Development along these streams will occur within the limits of hydrological stability. 1.102Avoid development that degrades the water quality in other streams to the level that fish habitat is negatively impacted. 1.103Avoid disturbance to spawning areas in the lower reaches and mouth of Bigmouth Creek and other streams draining into Lake Revelstoke. 1.4 Maintain marsh habitats along Lake Revelstoke.
For further information see *Resource Management – General Direction and Guidelines*	
Mountain caribou	
1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population	1.104Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5*. 1.2 Improve information on caribou habitat use in this area.

Landscape Unit R18 (Bigmouth/Louis Lee Creeks) (continued)

Objectives	Strategies
Mountain caribou (continued)	
2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	1.105Commercial Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5*. 2.2 Monitor winter recreation use, particularly in Nicholls Creek, and, if necessary, develop and implement a winter recreation plan which defines acceptable snowmobile use (time of year, trail location, type of users), similar to the plan for Frisby Ridge. Access will be restricted, if necessary, to achieve caribou management objectives.
3. Maintain balanced predator/prey relationship in critical caribou habitat	3.1 Monitor cougar and wolf population levels in critical caribou habitat.
For further information see *Resource Management – General Direction and Guidelines*	
Ungulates	
1. Maintain adequate critical winter range to maintain a viable moose population	1.1 Apply Ungulate Winter Range Guidelines to critical moose – leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4*.
For further information see *Resource Management – General Direction and Guidelines*	
Grizzlies/wide-ranging carnivores	
1. Maintain sufficient seasonal bear habitat to achieve population target levels	1.106Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*). 1.107Minimize and mitigate impacts of transportation corridor.
1.108Minimize grizzly bear displacement from this area	2.1 Develop and implement an Access Management Plan for this area. Access will be restricted, if necessary, to achieve grizzly bear management objectives.
For further information see *Resource Management – General Direction and Guidelines*	

Landscape Unit R18 (Bigmouth/Louis Lee Creeks) (continued)

Objectives	Strategies
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines*	1.109Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.110Mechanized use restrictions may be required for wildlife management. 1.3 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Heritage See *Resource Management – General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land See *Resource Management – General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber See *Resource Management – General Direction and Guidelines*	
Minerals See *Resource Management – General Direction and Guidelines*	
Settlement See *Resource Management – General Direction and Guidelines*	

Landscape Unit R19 (Goldstream/Stitt Creek)

Total area: 100,996 hectares Forested area: 48,636 hectares

Location – Goldstream, French, Camp, and Brewster Creek drainages

Values

Source	Value description
CORE	• **General biodiversity**: Natural Disturbance Type 1; regional connectivity corridors along Lake Revelstoke connecting to Kinbasket Lake and Goldstream River and Stitt Creek to Windy Creek; major riparian area at the mouth of the Goldstream River and French Creek; local connectivity to the Kirbyville corridor
CORE/ LOCAL	• **Fisheries**: Goldstream River – mountain white fish, lake chub, sculpin, sucker; Norman Wood Creek – west-slope cutthroat trout, Old Camp/McCullough/French Creeks – west-slope cutthroat trout; Stitt Creek – mountain white fish; Lake Revelstoke – white sturgeon, kokanee, bull trout, rainbow trout, mountain whitefish
CORE	• **Mountain caribou**: approximately 200 animals range through primary habitat in the lower reaches of the Goldstream River, Caribou Ridge, Nicholls, Hoskins, Liberty and Fissure Ceeks; large area of young forest at low elevation on east side of Lake Revelstoke is not currently suitable habitat; access conflicts with caribou in Brewster Creek and Big Fish Cr. Road areas; increasing snowmobiling use reduces habitat quality, particularly on Caribou Ridge
LOCAL	• **Ungulates**: 11,076 hectares critical moose winter range along Lake Revelstoke and in the Goldstream River bottomlands; additional high quality moose winter range in French Creek
CORE	• **Grizzly/wide-ranging carnivores:** grizzly bears, black bears, cougars, lynx, wolverines, marten and fishers; unrestricted access reduces habitat quality, especially in the Brewster drainage and Caribou Ridge
	• **Water**: licensed users
	• **Recreation**: lakeshore of Lake Revelstoke; upland mountainous areas, the Goldstream River, river recreation including canoeing (canoe route), kayaking and fishing, mountaineering, hiking, fishing, backcountry skiing and hunting; Groundhog Basin; snowmobiling; extensive alpine meadow complex; identified alpine values
CORE	• **Heritage**: McCullough Creek Placer Mining Area; Groundhog Basin, Goldstream Ranch, French Creek Townsite
	• **Commercial tourism** (H): heli-skiing/heli-hiking lodges (Canadian Mountain Holidays Gothics and Adamants Lodge), guide outfitting (Monashee Big Game Outfitters)
CORE	• **Viewscapes:** viewed from Canadian Mountain Holidays Adamants Lodge, Gothics Lodge, Lake Revelstoke and Highway 23 North

Landscape Unit R19 (Goldstream/Stitt Creek) (continued)

Values (continued)

Source	Value description
	• **Timber** (H): 17,380 hectares operable area; Evans Forest Products TFL 55 north of Goldstream; Revelstoke Community Forest Corporation TFL 56 south of Goldstream; extensively harvested Managed Tree Farm at the mouth of Goldstream River; immature forests on Lookout Mountain are candidates for intensive management, provided caribou habitat requirements can be met; areas outside biodiversity corridors and ungulate winter range are also candidates for intensive management, particularly Brewster and Norman Wood Creeks • **Minerals** (H-VH)**:** western half of unit has numerous documented metallic and industrial mineral occurrences including past producer Goldstream mine; placer gold in Old Camp, McCullough and French creeks; proposed Stitt Creek placer development for garnets; many tenures

Objectives	Strategies
General biodiversity	
1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.111Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management Guidelines section 2*. 1.2 Low biodiversity emphasis for the remainder of area.
2. Maintain the regional connectivity corridor along the east side of Lake Revelstoke to Kinbasket Lake and east to Kirbyville and from Lake Revelstoke to the major riparian areas at the mouth of the Goldstream River, and along the Goldstream River and Stitt Creek to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 *Resource Management Guidelines section 2*.
3. Retain habitat for threatened (red-listed) bat	3.1 Conduct research to identify habitat.
4. Retain cottonwoods as wildlife trees adjacent to riparian areas and restore cottonwood component in logged areas	4.1 List cottonwood as an acceptable crop tree. 4.2 Leave cottonwood as wildlife trees.
5. Retain existing riparian and wetland values and restore damaged riparian areas	5.1 Develop and implement a restoration plan for riparian areas in the Goldstream valley.

Objectives	Strategies
General biodiversity (continued) For further information see *Resource Management – General Direction and Guidelines*	
Fisheries 1. Maintain existing fish stocks and habitat for fish species in Goldstream River and its tributaries as well as Old Camp Creek and small streams draining into Lake Revelstoke For further information see *Resource Management – General Direction and* Guidelines	1.112Develop hydrological stability assessment procedures then conduct assessments of all fish-bearing streams in the Goldstream drainage to identify hydrological stability thresholds. Development along these streams will occur within the limits of hydrological stability. 1.113Avoid development that degrades the water quality in the other streams to the level that fish habitat is negatively impacted. 1.114Avoid disturbance to spawning areas in the lower reaches and mouth of Goldstream River and other streams draining into Lake Revelstoke. 1.4 Maintain marsh habitats along the Goldstream River and Lake Revelstoke.
Mountain caribou 1. Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population 2. Minimize caribou disturbance from recreation activities in areas designated for caribou management	*1.115*Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5.* 1.2 Improve information on caribou habitat use in this area. 1.116Commercial Recreation proposals will recognize and respect critical caribou habitat identified on Map 4 in *Resource Management Guidelines section 5*. 2.2 Develop and implement a winter access management plan which defines acceptable snowmobile use (time of year, trail location, type of users, number of users, enforcement and monitoring approaches) for the south end of Caribou Basin/Ridge. Access will be restricted, if necessary, to achieve caribou management objectives. Access will be restricted elsewhere on Caribou Ridge to achieve caribou management objectives. 2.3 Develop and implement a winter access management plan similar to the Frisby Ridge plan which defines acceptable snowmobile use (time of year, trail location, type of users) for the lower portions of the Goldstream drainage and Lookout Mountain. Access will be restricted, if necessary, to achieve caribou management objectives.

Landscape Unit R19 (Goldstream/Stitt Creek) (continued)

Objectives	Strategies
Caribou (continued) 3. Maintain balanced predator/prey relationship in critical caribou habitat For further information see Resource *Management – General Direction and Guidelines*	3.1 Monitor cougar and wolf population levels in critical caribou habitat.
Ungulates 1. Maintain adequate critical winter range to maintain a viable moose population For further information see *Resource Management – General Direction and Guidelines*	*1.117*Apply Ungulate Winter Range Guidelines to critical moose – leading winter range areas identified on Map 3 in *Resource Management Guidelines section 4.*
Grizzlies/wide-ranging carnivores 1. Minimize human conflicts with grizzly and black bears 2. Maintain sufficient seasonal bear habitat to maintain populationstarget levels 1.118Minimize grizzly bear displacement from the Goldstream drainage For further information see *Resource Management – General Direction and Guidelines*	1.1 Private lodge owners are encouraged to thoroughly incinerate or remove garbage from the lodge regularly. 2.1 Apply Grizzly Bear Management Guidelines *(Resource Management Guidelines section 3*). 2.2 Minimize and mitigate impacts of transportation corridor. 3.1 Develop and implement Access Management Plans for the Goldstream drainage. Access will be restricted, if necessary, to achieve grizzly bear management objectives.
Water 1.119Maintain water quality and quantity in creeks with licensed water users	1.120When timber companies or the Ministry of Forests propose operations in watersheds with licensed users, they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.121Licensed water users will be notified by advertisement of opportunities to review forest development plans.

Landscape Unit R19 (Goldstream/Stitt Creek) (continued)

Objectives	Strategies
Water (continued) For further information see *Resource Management – General Direction and Guidelines*	
Recreation 1. Maintain a range of recreation settings, features and facilities For further information see *Resource Management – General Direction and Guidelines*	1.122Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (Resource Management Guidelines section 8), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.123Motorized vehicles confined to existing roads. 1.124Goldstream River is to be managed for non-mechanized recreation. 1.125Ground Hog Basin is to provide semi-primitive motorized recreation experiences. 1.5 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Heritage See *Resource Management – General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land For further information see *Resource Management – General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development. 1.2 Update and implement the lower level plan for recreation and commercial tourism on Lake Revelstoke.
Viewscapes See *Resource Management – General Direction and Guidelines*	
Timber See *Resource Management – General Direction and Guidelines*	

Landscape Unit R19 (Goldstream/Stitt Creek) (continued)

Objectives	Strategies
Minerals See *Resource Management – General Direction and Guidelines*	
Settlement See *Resource Management – General Direction and Guidelines*	

Landscape Unit R20 (Illecillewaet/Tangier River drainages)

Total area: 99,728 hectares Forested area: 35,475 hectares

Location – Illecillewaet River drainage, including the Tangier River and other creeks

Values

Source	Value description
CORE/ LOCAL	• **General biodiversity**: Natural Disturbance Type 1 with a minor amount of 2 in the Greeley Creek drainage; regional connectivity corridor along the Tangier River and between the Illecillewaet River and the Mt. Revelstoke National Park boundary; frequent disturbance of important harlequin duck nesting area on the Illecillewaet River threatens this value
CORE	• **Fisheries**: regionally significant: Illecillewaet River/Albert Creek- bull trout, rainbow trout, cutthroat trout, kokanee, mountain whitefish; Bridge Creek – kokanee; Woolsey Creek/Twin Creek – bull trout
CORE/ LOCAL	• **Mountain caribou:** approximately 100 animals range north of Highway 1 into Mount Revelstoke and Glacier National Parks; no current recorded use south of Highway 1
	• **Ungulates**: 3,192 hectares critical winter range, primarily used by deer between Mt. Revelstoke National Park and Highway 1
CORE	• **Grizzlies/wide-ranging carnivores**: grizzly bears, black bears, cougars, lynx, wolverine, marten and fishers; unrestricted access reduces habitat quality in the Tangier River and Woolsey Creek drainages
	• **Water**: Greeley, Bridge and Hamilton Creeks are community watersheds for the City of Revelstoke; water supply for Canyon Hot Springs; license for Selkirk Springs water bottling plant; a few licensed domestic users
CORE	• **Recreation**: Upland mountainous areas, whitewater kayaking and river rafting on the Illecillewaet River, highway camping at Tangier River Recreation Site, hiking, backcountry skiing and mountaineering on Twin and Albert Peaks, camping, hunting, snowmobiling; identified alpine values
CORE	• **Heritage**: Illicillewaet River, Albert Canyon
	• **Commercial tourism** (H-M): extensive tourism operations within the community; heli-skiing (Selkirk Tangiers), guide outfitting (Selkirk Big Game Outfitters), backcountry skiing and hiking lodge (Selkirk Lodge*),* river rafting on the Illecillewaet (Apex Whitewater Rafting/Wildwater Rafting), hot springs/campground on private land(Canyon Hot Springs), existing tenure and possible expansion area for cat skiing (Cat Powder Skiing)
CORE	• **Viewscapes**: viewed from Highway 1, and the City of
	• **Timber harvesting** (H): 12,958 hectares operable area; Joe Kozek Sawmills in the Tangier drainage, Small Business Forest Enterprise Program in eastern drainage and Downie Timber area in the remainder; woodlot license north of Highway 1; candidate for intensive management in Twin Creeks

Landscape Unit R20 (Illicillewaet/Tangiers River drainages) (continued)

Values (continued)

Source	Value description
	• **Minerals** (M-H): numerous documented metallic and industrial mineral deposits, including some past producing mines; some mineral tenures • **Settlement**: part of the City of Revelstoke; residences along Highway 1 corridor; a few residences at the base of Greeley Creek

Objectives	Strategies
General biodiversity	
1. Retain forest ecological elements and processes, including species richness, distribution and diversity at a moderate risk level	1.126Intermediate biodiversity emphasis for the area identified on Map 1 in *Resource Management section 2.* 1.127Low biodiversity emphasis for the remainder of the area.
1.128Maintain the regional connectivity corridor along the north side of the Illecillewaet River to contribute to ecosystem representation and to serve as habitat linkage for seasonal migration, gene pool exchange and population dispersal	2.1 Connectivity function to be achieved through intermediate biodiversity emphasis and connectivity guidelines along the connectivity corridor identified on Map 1 in *Resource Management Guidelines section 2.*
1.129Decrease barriers to animal movement, reduce roadkills and increase connectivity across the highway	3.1 Cooperate initiatives by MoE, MoTH and CPR to improve construction and operating design of transportation corridors.
4. Maintain harlequin duck nesting productivity	4.1 Avoid disturbance to nesting harlequin ducks by preventing river recreation during early season nesting.
For further information see *Resource Management – General Direction and Guidelines*	
Fisheries	
1.130Maintain existing fish stocks and habitat for fish species in the Illecillewaet River and its tributaries, as well as Bridge Creek and Woolsey Creek	1.131Avoid development that degrades the water quality in these streams to the level that fish habitat is negatively impacted. 1.132Avoid disturbance to spawning and rearing areas in the lower reaches and mouth of the Illecillewaet River and its tributaries. 1.133Maintain marsh habitats along the Illecillewaet River. .

Landscape Unit R20 (Illicillewaet/Tangier River drainages) (continued)

Objectives	Strategies
Fisheries (continued) For further information see *Resource Management – General Direction and Guidelines*	
Mountain caribou 1.134Maintain sufficient seasonal habitat in areas designated for caribou management to retain the existing mountain caribou population, particularly in linkage areas between habitat in Mt. Revelstoke and Glacier National Parks 2. Discourage cougar presence in critical caribou habitat 3. Minimize and mitigate impacts of transportation corridor For further information see *Resource Management – General Direction and Guidelines*	1.1 Apply Mountain Caribou Management Guidelines in critical habitat identified on Map 4 in *Resource Management Guidelines section 5.* 2.1 Monitor cougar population levels in critical caribou habitat. 2.2 Encourage hunter harvest of cougars in critical caribou habitat. 3.1 Cooperative initiatives by MoE, MoTH and CPR to improve construction and operating design of transportation corridors.
Ungulates 1.135Maintain adequate critical winter range to maintain viable populations of mule deer, elk and white-tail deer, in this order of priority For further information see *Resource Management – General Direction and Guidelines*	1.136Apply Ungulates Winter Range Guidelines to critical deer-leading winter range areas identified on Map *3 in Resource Management Guidelines section 4.*
Grizzlies/wide-ranging carnivores 1. Discourage use by carnivores in the developed areas along Highway 1 and the City of Revelstoke 2. Minimize conflicts with grizzly and black bears at the commercial lodge and campground	1.137Develop and implement Local Bear Plan. 1.2 Reduce bear attractants. 2.1 Private lodge owners and campground operators are encouraged to thoroughly incinerate or remove garbage from the lodges and campgrounds regularly.

Landscape Unit R20 (Illicillewaet/Tangier River drainages) (continued)

Objectives	Strategies
Grizzlies/wide-ranging carnivores (continued)	
3. Maintain sufficient seasonal bear habitat in the remaining area to achieve population target levels	3.1 Apply Grizzly Bear Management Guidelines (*Resource Management Guidelines section 3*).
4. Minimize and mitigate impacts of transportation corridor	4.1 Cooperative initiatives by MoE, MoTH and CPR to improve construction and operating design of transportation corridors.
5. Minimize grizzly bear displacement from the Tangier and Woolsey drainages	5.1 Develop and implement an Access Management Plan for the Tangier River and Woolsey Creek drainages. Access will be restricted, if necessary, to achieve grizzly bear management objectives.
6. Maintain viable cougar populations outside residential areas	6.1 Maintain ungulate prey species. 6.2 Maintain sport harvest within sustainable levels.
For further information see *Resource Management – General Direction and Guidelines*	
Water	
1. Maintain water quality and quantity in Greeley, Bridge and Hamilton Creeks and creeks with licensed water users	1.1 Apply the Forest Practices Code Community Watershed Guidebook to Greeley, Bridge and Hamilton Creeks. 1.2 When timber companies or the Ministry of Forests propose operations in watersheds with licensed users, they will advise licensed water users of proposed operations and offer the water licensees the opportunity to participate in preparing a written contingency plan. 1.3 Licensed water users will be notified by advertisement of opportunities to review forest development plans.
For further information see *Resource Management – General Direction and Guidelines*	
Recreation	
1. Maintain a range of recreation settings, features and facilities	1.1 Recreation settings are to be consistent with the Backcountry Recreation Management Guidelines (*Resource Management Guidelines section 8*), primarily in the Semi-Primitive Non-Motorized and Roaded Resource Land Categories. 1.2 Maintain the Tangier River campground as a BC Forest Service Recreation Site.
2. Restrict access adjacent to National Park boundaries	2.1 Complete and implement an Access Management Plan.

Landscape Unit R20 (Illicillewaet/Tangiers Rivers; Greeley/Albert Creeks) (continued)

Objectives	Strategies
Recreation (continued) For further information see *Resource Management - General Direction and Guidelines*	
Heritage See *Resource Management - General Direction and Guidelines*	
Commercial tourism 1. Integrate the needs of commercial recreation tenure holders with public recreation activities, logging and mining development on Crown land For further information see *Resource Management - General Direction and Guidelines*	1.1 The appropriate resource agencies will work with commercial recreation tenure holders to develop statements of concern and interest including Crown land areas of particular interest and approaches to resource development.
Viewscapes 1. Design of timber harvesting, forest management and mineral exploration is to reflect the importance of the visual quality of areas visible from designated viewpoints on Highway 1 and within the City of Revelstoke For further information see *Resource Management - General Direction and Guidelines*	1.1 Apply the Frontcountry Visual Management Guidelines as indicated on Map 5 in *Resource Management Guidelines section 7* to meet Class 1 objectives for viewscapes from designated viewpoints on Highway 1 and within the City of Revelstoke. 1.2 Designate scenic areas as indicated on Map 5 in *Resource Management Guidelines section 7* as Known Scenic Areas under the Forest Practices Code.
Timber 1. No development on unstable CPR moratorium area in the Illecillewaet River valley For further information see *Resource Management - General Direction and Guidelines*	1.1 CPR moratorium on timber development on unstable slopes above the rail lines should be continued.
Minerals See *Resource Management - General Direction and Guidelines*	

Landscape Unit R20 (Illicillewaet/Tangiers Rivers; Greeley/Albert Creeks) (continued)

Objectives	Strategies
Settlement	
1. Maintain opportunities for settlement-oriented uses and expansion on Crown land within existing settlement areas and corridors	1.1 Continue to make small parcels of suitable Crown land available for settlement-oriented purposes within the existing settlement corridor on map 6 in *Resource management Guidelines section 11* when consistent with resource management objectives.
2. Recognize environmental, conservational and other land use and resource management objectives when making decisions on the allocation of Crown land for settlement purposes	2.1 In considering proposals to allocate Crown land for settlement purposes, make efforts to direct dispositions into suitable areas away from regionally significant connectivity corridors and habitats, as determined through referrals to resource agencies. Settlement areas are to be in general conformance with approved, local level strategic land use plans.
For further information see *Resource Management - General Direction and Guidelines*	

Chapter C Impact Assessment

Section 1. Timber Supply Analysis

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C. 1.1 Introduction

Timber is currently harvested from four distinct management units in the Revelstoke area. Figure 1 illustrates the location of these units..

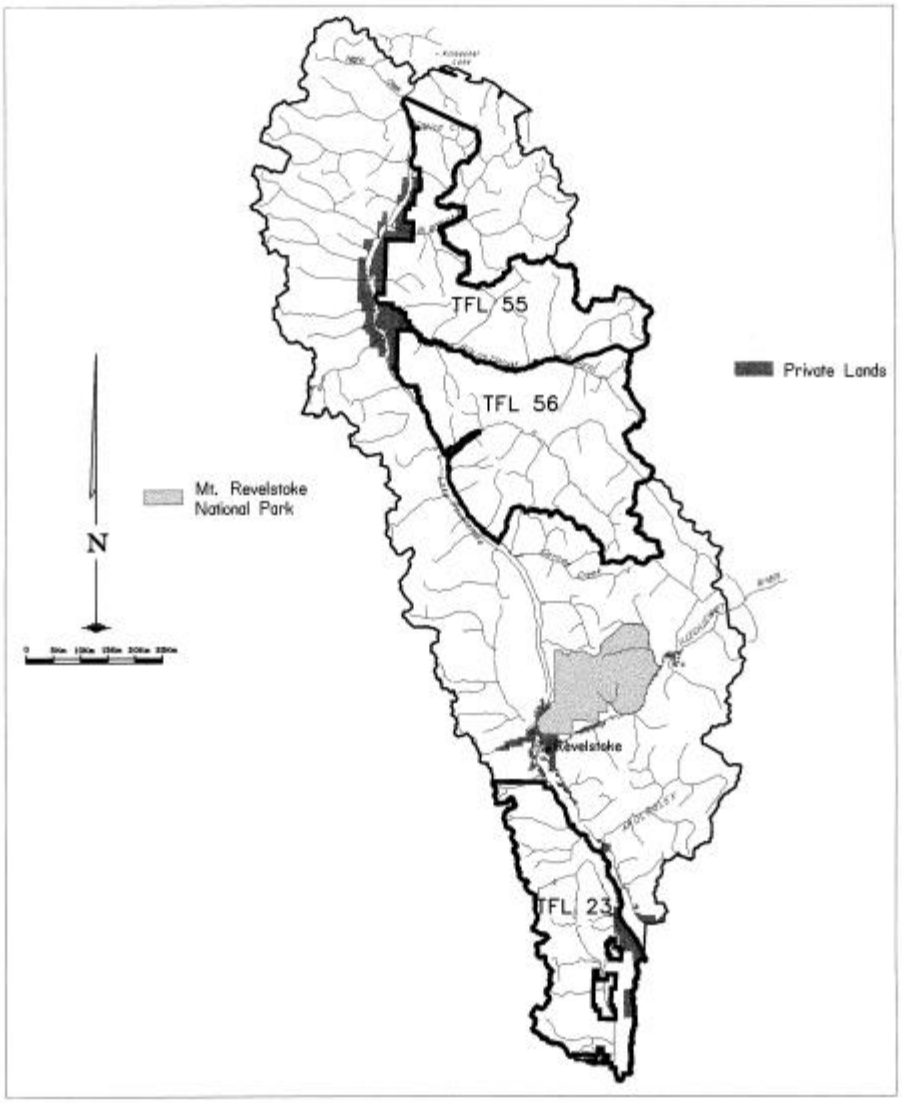

Figure 1. Forest management units in the Revelstoke area

As the allowable annual cut is decided separately for each of these units, separate analyses were conducted to estimate the available timber supply from each of the units.

Timber supply analysis uses computer models to predict the amount of timber that is available for harvesting in 10-year periods based on the following factors:

- the amount of area that is suitable and available for harvesting
- the age and type of current forests
- estimates of how fast the forest will grow,
- the management practices that are applied to achieve different management objectives
- controls on the rate of change of harvesting level

As trees take many decades to become suitable for harvesting, these analyses assess timber supply over a long period of time - usually 250 years. Analyses over this time period, using the best available information about the forest and how it grows, provide the most reliable forecasts of the timber supply implications of management practices that can be produced currently. However, these forecasts are only as good as the data that is used in the analysis, and the reliability of the forecasts for later periods is much less than for the short-term.

C. 1.2 Analysis of Draft MAC Strategy

After the initial regional analysis indicated the potential of a 40% timber supply reduction in the next 10 years, the local Technical Team undertook independent timber supply analysis to test a broad range of options. The Technical Team presented the results of these analyses to the MAC which, in turn provided the Technical Team with direction on further analyses. In April 1996, the MAC reached preliminary agreement on a strategy. However, in late June 1996, the timber supply analysts expressed concerns about the accuracy of the work, indicating the need to redo the analysis to verify the forecasts.

The reanalysis was completed in January 1997. During the reanalysis it was discovered that the data for TFL 23 was unreliable and could not be used for this process. It was decided that an annual harvest of 37,700 cubic meters would be used for this analysis to estimate supply for the first two decades only.

Figure 2 shows the results of the 1997 reanalysis that was used to prepare the draft MAC strategy which was reviewed by the public in October 1997.

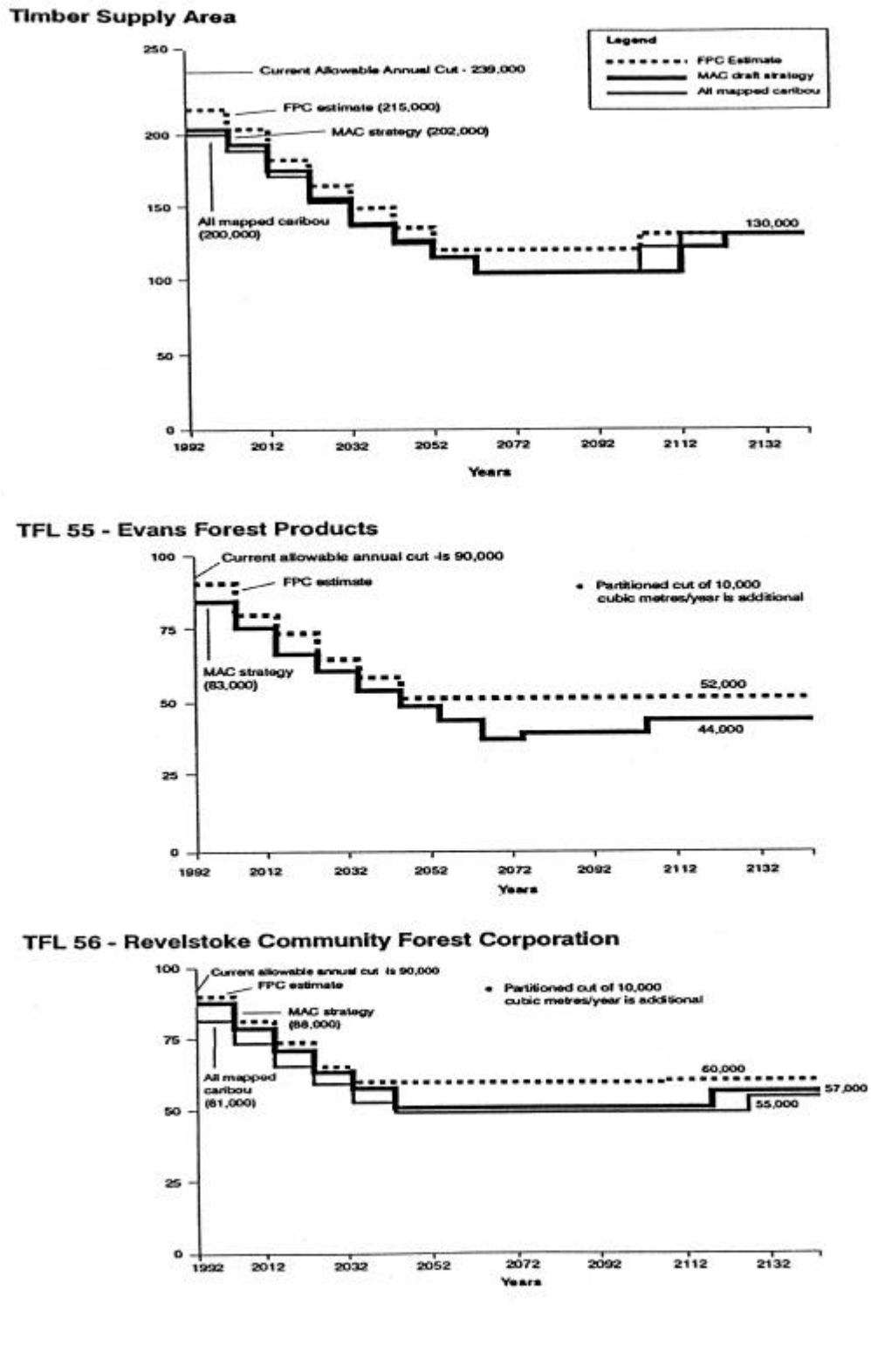

Figure 2. Timber supply forecasts from 1997 reanalysis

C. 1.3 Analysis in Response to Public Input

During the public review, Revelstoke Community Forest Corporation and Evans Forest Products presented the Committee with timber supply analyses which conflicted with the analysis completed for the Committee. There was much public discussion and input about the discrepancies between the analysis, always calling for the need for greater certainty before the Committee prepared its final recommendations for the provincial government.

In November 1997, after considering the new information and public concerns, the Committee directed the Land Use Planning Technical Team to examine ways to improve the timber supply analysis information. Over the past 18 months, a timber supply consultant has worked with the Technical Team and local forest company representatives to develop state-of-the-art analysis for the Community Tree Farm (TFL 56) as a case study area. This work yielded some surprising results with provincial implications for land use planning and timber supply analysis.

The bottom line from this work was that the forecasts originally provided for the draft MAC strategy for the Community Tree Farm had not fully reflected the proposed management practices, and much more substantial timber supply impacts could be expected from the draft strategy. This prompted reconsideration of the management practices to reduce the forecasted impact to an acceptable level. Innovative work by the Technical Team, Revelstoke Community Forest Corporation staff and the timber supply analyst has resulted in new approaches that do not substantially increase the risk to key environmental resources, while achieving a 6% reduction in timber supply during the next 10 years – 4% higher than the forecast for the draft strategy. Figure 2 provides the final timber supply forecast from this analysis. Technical reports are available from Ken Gibson, Columbia Forest District (250 837-7743) which provide the details of these analyses.

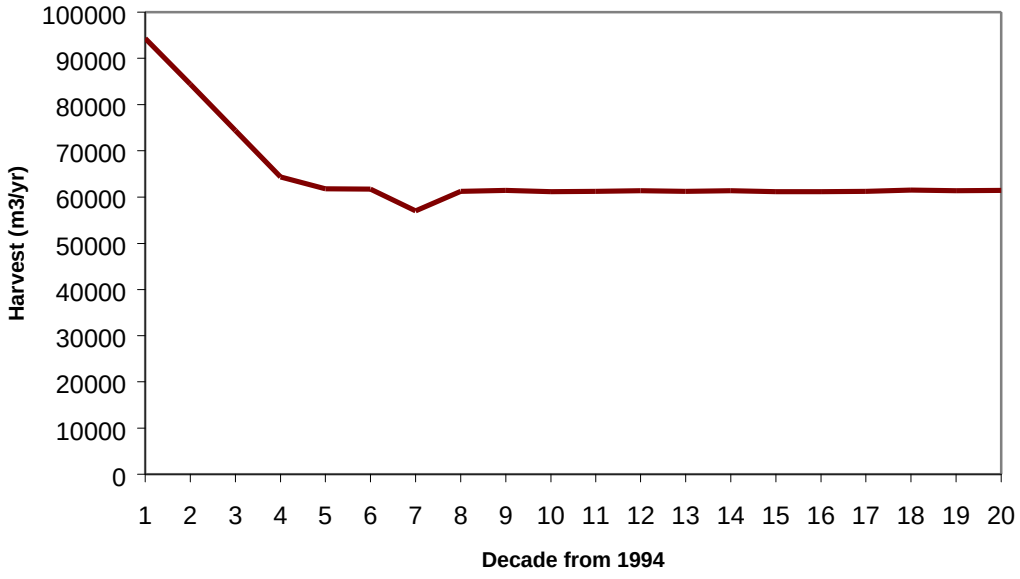

Figure 2. Timber supply forecasts for the final MAC strategy for the Community Tree Farm License

The Community Tree Farm License analysis was extrapolated to the Evans Tree Farm License (TFL 55) and it was decided that implementing the same revised practices on this unit in conjuction with minor modifications to moose winter range and intermediate biodiversity mapping would likely result in a similar timber supply forecast as in the draft strategy (8% reduction for the next 10 years), which was acceptable to MAC.

While this work was being completed locally, the Chief Forester completed a revised analysis of the draft strategy as part of his five year review of timber supply from the Revelstoke Timber Supply Area, which does not include the tree farm licenses. This analysis indicated the draft MAC strategy would not create any timber supply reductions for 40 years (see Figure 3). While the Committee has concerns about the quality of some of the data and the lack of spatially explicit modelling in this analysis, the long timeframe before any expected timber supply reductions occur provides flexibility to adjust if necessary. Consequently the Committee revised its assessment to assume no near term timber supply impacts for the timber supply area. Timber supply review reports are also available from Ken Gibson at the Columbia Forest District Office.

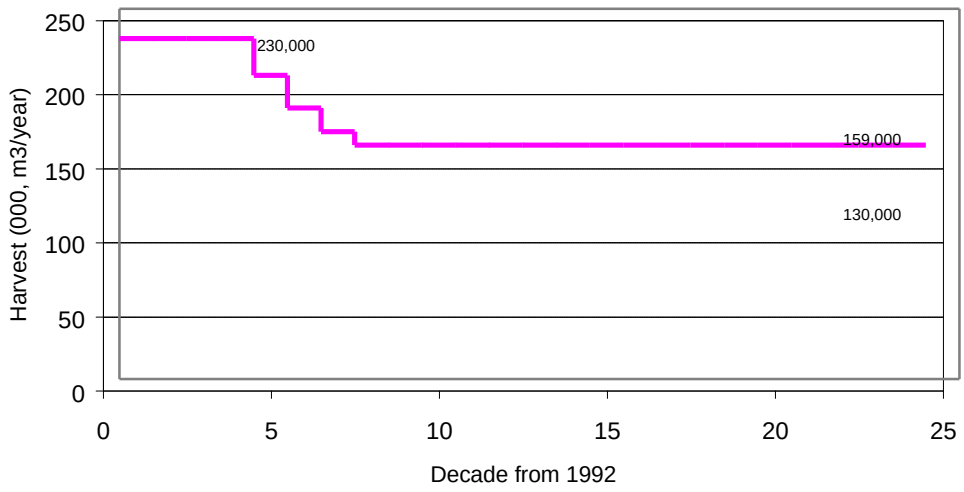

Figure 3. Timber Supply Review analysis of the draft MAC strategy for the Timber Supply Area

Pope and Talbot Ltd. has also been completing timber supply analysis required for the five year management planning process and the timber supply review for their Tree Farm License 23 (on the west side south of town). They have informed MAC that it is possible to at least maintain the harvest level MAC had assumed for the draft strategy, so no revisions were required to the draft management practices for this area.

C. 1.4 Summary of Timber Supply Impacts for the Final Strategy

Table 1 summarizes the estimated changes in timber supply for the next two decades and the longterm. An average timber supply reduction of 3% is now forecast, compared to 12% in the draft strategy.

Table 1. Timber supply estimates for the final strategy

Management Unit	**Estimated Timber Supply** (thousand cubic metres per year)			
	Current	Decade 1	Decade 2	Longterm
TSA	239	239	239	160
TFL 23	37	37	37	37
TFL 55	100	92	83	44
TFL 56	100	94	85	61
Total	476	462	444	302
Average reduction (%)	0	3	7	37

The analyses indicate two general periods of timber supply:

- a number of decades where timber supply is forecast to decline
- the long-term level that is forecast to be continued indefinitely

The timber supply situation in the Revelstoke area is a common dilemma - the area currently supports a relatively large amount of mature forests that are suitable for harvesting, however, in all of the tenures, a timber supply ‘shortfall’ occurs after the existing mature forests are harvested. This occurs because the currently young forests have not yet become mature and suitable for harvesting. This ‘shortfall’ requires careful metering out of the current mature timber in the early decades to avoid catastrophic reductions far into the future. There is basically a fixed amount of mature timber that can be harvested early on or later - but it can only be harvested once.

Final Report

REVELSTOKE AND AREA LAND USE PLANNING RECOMMENDATIONS MULTIPLE ACCOUNTS ANALYSIS

Prepared for
Revelstoke Minister's Advisory Committee

Draft Report prepared by:
The ARA Consulting Group Inc.
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Revelstoke Land Use Planning Technical Team
Revelstoke Land Use Planning Economic Team
Economics Branch, Ministry of Employment and Investment

Final report prepared by:
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Revelstoke Land Use Planning Economic Team

October, 1999

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1. Introduction

A draft impact assessment was prepared in August, 1997 and provided an impact analysis of the Revelstoke Minister Advisory Committee's (MAC's) draft land use. The analysis includes an assessment of the plan on environmental and community values, and the forestry, tourism, recreation and mining sectors. For each of these sectors, the following information is provided:

- profile of current status of sector;
- impact methodology - a discussion of the methodology used to assess impacts of the draft strategy;
- impact analysis of the following 'scenarios':
  - ⇒ Before FPC - the management regimes described in the first Timber Supply Reviews (TSR 1) for the Revelstoke Timber Supply Area (TSA) and Tree Farm Licenses (TFLs) 23, 55 and 56 and other relevant factors affecting the sector;
  - ⇒ Forest Practices Code (FPC) estimate - interpretation of applying the FPC as designed by the MAC (FPC estimate); and
  - ⇒ draft MAC Strategy - which includes incremental management over the FPC estimate, and additional management guidelines to be implemented through the Kootenay/Boundary Land Use Plan

This final report brings the draft report up to date to June 1999. The majority of the changes from the draft report are due the availability of the 1996 census data (1991 data was available for the draft report), changes in the economic sectors since 1997, and the impacts of the final land use strategy.

Impact analyses attempt to determine impacts (positive, negative or neutral) relative to a base case, as this allows for the measurement of the incremental impacts as a result of the draft implementation strategy. The base case includes current and anticipated land and resource management that would occur in the absence of the implementation of a land use plan. The reduced annual allowable cut determined in the first TSR and the impacts which are anticipated to result from this change would be included in the base case. As the FPC is current regulation governing forest practices, it should also be considered 'base case', however, this is complicated by the fact that the implementation of the FPC can be to a large extent guided by the Strategy. Hence under different plans, the impacts of the FPC will differ. In this analysis, an attempt has been made to separate the impacts attributable to the FPC, but it should be recognized the distinction between FPC and the land use plan is not necessarily well defined.

The impact analysis has been designed as a multiple accounts analysis which allows for both qualitative and quantitative analysis of the potential impacts of the draft strategy. This type of analysis presents the impacts on each sector or value separately, so that the reader can examine the trade-offs involved in each strategy being considered. Multiple Accounts Analyses make no attempt to sum up or total the overall impacts of a strategy, as the determination of the preferred outcome is to be made by the reader and not by the analysts.

2. Revelstoke Area — Overview

The Revelstoke area is situated within a spectacular mountainous setting. The Trans-Canada Highway and the CP Rail transportation corridors provide east and west access routes. Highway 23 provides access to Mica Creek and the resources to the north and to the Kootenay Area to the south. Approximately 8,700 persons[1] reside in the area. The population has grown by about 3.6% since the 1991 Census.

Revelstoke began as a transportation and supply centre for the mining industry. This was followed by the construction of the transcontinental railway and the establishment of CP Rail's area maintenance facilities in Revelstoke. At the same time, the timber industry grew to be a major sector for the community's economy. CP Rail opened the area up to tourism by providing travellers with access to the National Parks. In 1962, the Trans Canada Highway was opened through Rogers Pass and the area experienced a second wave of tourism growth. Throughout this time the community of Revelstoke has continued to grow and diversify.

Beginning in 1965, the construction of three hydro-electric facilities and the creation of large reservoirs brought significant economic growth for the area, but also resulted in flooded agricultural and forestry lands and wildlife habitat. The economy faced a significant downturn once the projects were completed in the early 1980s. After that, the community experienced a solid turnaround with the implementation of a community economic development strategy which included a downtown revitalisation project, support for small business development, encouragement of tourism and strengthening of the timber industry.

One recent initiative has been the creation of the Revelstoke Community Forest Corporation. Its goals are to secure access to local wood supplies for local processing through the purchasing of a Tree Farm Licence by a community held company. The outcome of this initiative was an increase in the level of wood processing in Revelstoke - from 4% in 1986 to over 60% in 1996. This helped to diversify the local economy and transform the public mood, stabilize the population base, and generate a general air of confidence in the community's long term future.

However, the area is again going through adjustments within the transportation, mining and forestry sectors, which are discussed in the sections that follow. To address these changes the community has recently undertaken a strategic planning exercise to identify and prioritize economic projects for the area.

Economic Base

In contrast to many other small BC towns, Revelstoke's economic base is quite diversified, including the transportation, forestry, and tourism and public sectors. Using an 'economic base' model, the Ministry of Finance and Corporate Relations has estimated the contribution to employment and income of various 'basic' and 'non-basic' sectors of local economies, based on 1996 Census data.

Basic sector income and employment is generated by income that flows into the community from the outside the area, such as the production of goods and services which are exported from the area. Non-basic sector income and employment is generated via the spending of basic income. Figure 1.1 illustrates the main basic sectors within the area.

[1] Statistics Canada, 1996 Census.

Total employment is estimated at 4,740 in 1996, with about 80% of that employment derived from basic sector industries. The main sectors generating the majority of the area's basic employment are forestry, tourism, public sector and other basic employment, which includes transportation.

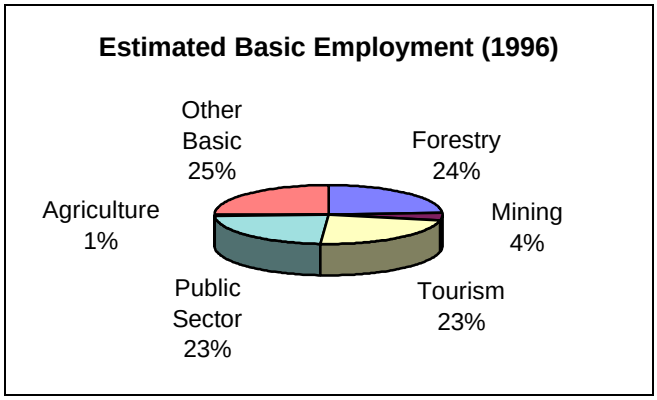
Total area income before tax in 1996 is estimated at $152 million, with about 87% derived from basic sector industries. Almost 66% of basic income is derived from four categories: forestry, 'other' basic sectors (including transportation), tourism, and the public sector. The difference between the income and employment shares is due to the differences in wages between the various sectors and the inclusion of non-employment sectors in the income data.

Non-basic income and employment is that which is generated by the spending of basic income by local residents. Non-basic activity accounts about 20% of total employment and 13% of total income.

As these figures represent the income and employment in 1996, it is likely that the relationship between the sectors has changed somewhat since then. Indeed, in recent years to area has seen a decrease in activity within mining and transportation (as discussed below), and the 1991 - 1998 period has been a time of increased stability in the forest sector compared to the 1980's. In addition, since 1996, there has been increased investment in the forestry and tourism sectors. These factors would result in a relative increase in the share of income and employment generated by these sectors.

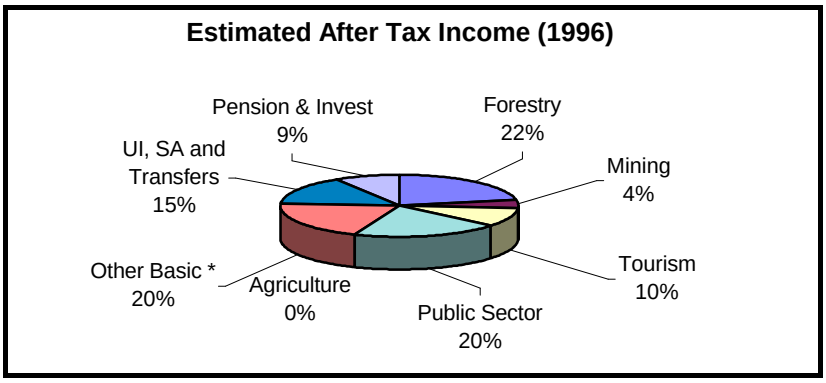
The following is a brief discussion of the current status of the economic sectors which will not for the most part be influenced by the implementation of a land use plan such as the MAC Strategy. The detailed discussion of the values and sectors which could be influenced by the MAC Strategy follows this discussion.

Figure 1.1 Revelstoke Area 1996 Basic and Non-Basic Sector Employment and Income



Note: other basic includes the transportation sector

Total Employment:	4060
Basic Employment:	3810 (80%)
Non-Basic Employment:	930 (20%)



*includes transportation sector

Total After Tax Income:	$128.3 million
Basic Sectors:	$110.8 million (86%)
Non-Basic Sectors:	$17.5 million (14%)

Source: Ministry of Finance and Corporate Relations, Economic Dependency Database, based on 1996 Census data.

Transportation

Historically the rail transportation sector has been a mainstay of the area's economy and has generated the largest and most stable source of high income employment for the area. To remain competitive, CP Rail has undergone major corporate restructuring over the past 5 years which resulted in a reduction in the Revelstoke workforce. However, Revelstoke remains an important centre for CP Rail's operations, as it is a key division point in the BC District Operation, and is a major crewing and major track maintenance centre. CP Rail also remains an important employer in the area. Currently CP Rail employs about 400 people locally, which is a decline from the high of 525 prior to the restructuring.

Highway traffic has grown significantly with the completion of the Rogers Pass section of the Trans-Canada highway in 1962. This provided a major boost to tourist and commercial traffic travelling the highway. Over four million people annually now travel this stretch of the Trans-Canada Highway. A Trans Canada Highway Corridor Management Plan (TCH CMP) is currently under development, a deliverable from which will be a 25 year investment program for the corridor, including short term (1-5 years), medium term (6-15 years) and long term (16 - 25 years) programs. The Plan is expected to be completed by Fall of 1998.

Power Generation

There are several power generating facilities in the area, including three BC Hydro dams (Walter Hardman, Revelstoke and Mica Creek), and the Akolkolex, a private power project. The Revelstoke and Mica Creek hydro-electric production facilities employ about 85 persons, most of whom are residents of Revelstoke (including contract labour). The two dams represent 33% of B.C. Hydro's electrical production within the province. During the construction phase of these facilities employment peaked at 2,800 construction jobs. One legacy of these projects is a large pool of construction industry expertise in the general area. An independent power project in the Pingston area has received government approval.

Other Resource Based Industries

Another resource-based operation is the NAYA Inc. water bottling operation, 40 km east of Revelstoke, which employs up to 74 persons seasonally. There is also a smaller mineral water plant in the area, employing about six people. A very successful local microbrewery, Mt. Begbie Breweries, has recently been established and relies on high quality water.

3. Environmental Resources

3.1 Regional and Historical Context

Regional Context

The Revelstoke Planning Area includes portions of three ecosections: North Kootenay Mountains (NKM formerly NCM or North Columbia Mountains), Central Columbia Mountains (CCM) and Big Bend Trench (BBT). The area is dominated by the NKM, with a significant area of CCM and a very minor portion of BBT (see Table 3.1). The CCM occurs in the main Columbia Valley and Monashee Mountains from Revelstoke south. The BBT occurs at mid and lower elevations northeast of Mica. The remainder of the planning area is in the NKM (see p.12 for further explanations of abbreviations).

The planning area includes over half of the NKM that occurs in the Kootenay/Boundary Region, but only 7% of the BBT and 7% of the CCM. The area includes over 85% of the regional occurrences of the ESSFvc, ICHvk1 and ICHmw3 Biogeoclimatic Units (BEC Units or vegetation zones, see table 1). From a biodiversity perspective, these BEC Units have a high priority for protection and/or low risk management in the area, because they do not occur in significant amounts elsewhere in the region.

In the remainder of the region, outside of the Revelstoke Planning area, the relevant BEC units of the CCM have a moderate level of protected area, except the ICHmw3, which is low. The relevant BBT BEC units have a very low level of protection everywhere. The NKM has a moderate level for BEC units other than the ESSFwc2 and ICHvk1, which are low.

Table 3.1 Distribution of ecosections and BEC units within the Revelstoke Planning Area.

Ecosection	BBT	CCM	NKM	Total	Portion of Total Kootenay/ Boundsry BEC Unit
BEC Unit*			**hectares**		**%**
AT		23502	277993	301495	15
ESSFvc			229388	229388	93
ESSFwc4		23583	31560	55143	7
ESSFwc2			11676	11676	16
ICHvk1	4058		94181	98239	96
ICHwk1	1293	12167	95175	108635	39
ICHmw2		8728		8728	1
ICHmw3		38244	5159	43403	87
Total	5351	106224	745132	856707	
% Total Kootenay/ Boundary Ecosection	7	7	56		

*AT = Alpine Tundra; ESSF = Engelmann Spruce-Subalpine Fir; ICH = Interior Cedar-Hemlock

The region supports a diversity of ungulates and large carnivores, including species such as mountain caribou, mule deer, mountain goat, mountain lion, wolves, coyotes, black bears and grizzly bears. Extensive areas of old growth wet belt forests combined with a relatively large population of mountain caribou make this area unique in the Kootenay/Boundary Region. The rivers and lakes support sizeable fresh water fisheries, including bull trout, rainbow trout, westslope cutthroat, rocky mountain whitefish and kokanee. In addition, the wetlands, rivers and lakes support waterfowl, osprey, bald eagle and blue heron habitat.

Historical Development Impacts on Environmental Resources

Forest harvesting has begun to change the landscape features in two main ways: fragmenting what was an almost continuous forest cover and alteration of seral stage distributions (i.e. reducing old growth and creating an abundance of younger stands). Road construction for timber harvesting has further fragmented the landscape and created significant sediment impacts on streams in a number of locations. Although the most visible alterations to the natural landscape in the planning area are timber harvesting (mainly over the past thirty years), other types of development have had a more profound and long-lasting effect on the environmental resources of the area. The risks indicated in Figure 1 at Year 0 (roughly today or early 1990s) provide an indication of the cumulative impacts associated with past development. The risk maps do not include impacts resulting from dams and/or development in Protected Areas).

Transportation Corridors

Over the past century and a half, significant changes have occurred to the natural landscapes represented within the Revelstoke Planning Area due in part to the development of transportation corridors. In 1885 the Canadian Pacific Railway completed a railway line through Rogers Pass, which has served as a corridor for human access and development ever since. Initially the railway and associated fires served to increase diversity in the landscape, by creating early seral habitat that was rare in the wet old growth stands of the area. With the addition of the Trans-Canada Highway, and further rail line development, the wide transportation corridor serves as a barrier for north-south movement for many species in the area.

In the early portion of the 20th century, settlement in Revelstoke and south along the Columbia River created some disturbance and openings in those areas, however impacts were limited in extent. The major impacts began with dam construction in the 1930's.

Dams and Reservoirs

The construction of the Grand Coulee Dam in Washington State, and the consequent elimination of the upper Columbia salmon runs has had a profound and long-lasting effect on the area. An effective mechanism for transferring a nutrient-rich, high-energy food source from the Pacific Ocean to the southern interior of B.C was erased when the floodgates closed. This had a profound effect on the food chain from micro-organisms to grizzly bears. Beginning in the 1960's local reservoir development further impacted the area.

Limited data was collected on fish and wildlife populations and habitat needs prior to construction of the three dam projects that affect the Revelstoke area - the Arrow, Mica, and Revelstoke. All of these dams have significantly altered fish and wildlife habitats within the region. The range of impacts include:

- loss of lakes and large areas of riparian habitat;
- loss of extensive low elevation productive forest in the ICH;
- displacement of wildlife species due to loss of habitat and disruption of connectivity (i.e. continuity of habitat or the ability for species to move freely between habitat patches);
- loss of spawning area and decline in fish populations due to water level fluctuations and changes in water temperature, sedimentation patterns, water chemistry and feeding habits; and
- creation of barriers to migratory fish.

These historic changes to the environment reduce the ability of ecosystems to withstand further changes resulting from resource use. Natural ecosystems usually have built in redundancies to deal with minor losses (i.e. multiple areas of similar habitat). However, once the natural diversity is reduced, these redundancies disappear, and the significance of the impacts to the environment increases.

3.2 Analysis Methodology

Environmental impact analysis was completed in two stages. The 1996 stage compared proposed management regimes with a low risk Benchmark scenario defined in the B.C. Environment Regional Biodiversity Strategy (9/1/95). In 1997, further analysis compared projected seral stage distributions resulting from the various scenarios with estimated natural distributions as a means of assessing habitat-related risk to environmental values. In 1999, these analyses were updated based on the professional judgement of the Revelstoke Land Use Planning Technical Team. The results of all three stages are summarized here.

The impact analysis has evaluated and compared potential medium and long term impacts (20 to 250+ years) and risks to various environmental values that may result from the implementation of three land management options for the Revelstoke Planning Area, as described in the introduction:

The underlying assumption is that the most appropriate environmental indicators at regional and sub-regional planning levels are measures of habitat extent and quality (Salasan et al. 1996). Simply put, all living things have certain environmental requirements, and if those don't exist, neither will the organisms. The analysis attempts to predict medium and long term potential risks (defined in terms of the likelihood of population viability) of pursuing the various options, by estimating the extent to which necessary habitat elements for healthy terrestrial and aquatic ecosystems will exist in the future, if each management option were to be implemented. The following are additional assumptions on which the analysis is based:

- the initial analyses assumed the Forest Practices Code (including guidebooks) and other guidelines will be implemented as written, without relaxation due to social or economic considerations; there will be no harvesting in the inoperable or operable non-contributing areas – the final assessment takes into account the relaxation of biodiversity guidelines in Tree Farm Licenses 55 and 56, and the increased operable area estimates for all of the management units;
- as the site specific application of access controls and bear attractants will be decided by local planning processes, the analysis has presented two possible impact regimes - with and without effective access and bear attractant management guidelines;
- caribou guidelines to be implemented as part of the plan are roughly equivalent to the BC

Environment Caribou Guidelines included in the Regional Biodiversity Benchmark; and

- the original analysis assumed the ungulate winter ranges guidelines to be implemented as part of the plan are roughly equivalent to the BC Environment Ungulate Winter Range Guidelines included in the Biodiversity Benchmark; the final assessment takes into account the revised mapping of ungulate winter range and revisions to the moose management guidelines for Tree Farm Licenses 55 and 56.

1996 Analysis

In the 1996 analysis, management options were compared to the benchmark or "preferred management regime", which defined low risk management for the values of concern. Comparing the management options to the benchmarks allowed for the risks facing these values to be assessed. The specific components used for the evaluation have been identified in the Kootenay-Boundary Biodiversity Benchmark (9/1/95): Representative Ecosystems/Regional Connectivity, Mountain Caribou, Grizzly Bears, Ungulate Winter Ranges and Regionally Significant Fisheries.

The methods employed for this analysis generally followed those described in the recent Ministry of Environment document, "Review of Environmental Resource Analysis Approaches for LRMP" (Salasan et al. 1996). Habitats for each analysis component of the biodiversity strategy were mapped in various classes of management priority or level of importance. B.C. Environment "preferred management regimes" - those considered to be within the range of low risk management for the value under consideration, were defined for each component. . The benchmarks are then defined by targeted percentages of habitat under specified management regimes. These benchmark management regimes were evaluated and assigned a relative weighting factor based on their likelihood of achieving suitable habitat for the value under consideration (see Table 3.2). The percentages of each management regime identified in the benchmark are then multiplied by the appropriate weighting factor. These results for the benchmarks are totaled and adjusted to fall near the top end of a 120 point Risk Index scale.

Table 3.2 Relative ratings of management regimes and changes to seral stage distribution.

---------- **Management Regimes** ----------						
Protected Areas	MELP Habitat Guidelines	High Emphasis Biodiversity	Moderate Emphasis Biodiversity	Low Emphasis Biodiversity	General TSR1 Forest Management	Private or Dedicated
---------- **Seral Stage Distribution** ----------						
Natural Ranges	------>		Moderate Modifications	------>		Major Modifications
---------- **Increasing Risk to Biodiversity Strategy Components** ---------->						

To evaluate alternative options, GIS overlays of mapped habitats were combined with management regimes under the proposed land use option to determine the percentage of various management regimes

in each habitat category. No distinction was made between operable and inoperable landbase. The percentages of each management regime identified in the proposed option were then multiplied by the appropriate weighting factor as described above and totaled. These are similarly adjusted to fit the 0-120 Risk Index scale for comparison with the benchmarks and between options. Results are summarized by ecosections, BEC units, populations, or other parameters as required.

1997 Analysis

The primary objective of the 1997 analysis was to verify the 1996 analysis results by investigating whether an alternative approach would provide similar results to the methods utilized in 1996.

For the 1997 analysis, changes to seral stage distribution were selected as a measurable indicator of potential risk to wildlife habitat, stream flow and general biodiversity. A simple definition of seral stage distribution would be the relative percentages of forests of different age classes present within an area (i.e. recently burned or harvested areas, young stands, mature or old forests). Under natural disturbance regimes the mix of age classes generally reflects average frequency of fires or other stand-replacing events. Forest harvesting and other management practices can modify the natural distribution, generally increasing the area of younger seral stages and decreasing older ones. As indicated in Table 2, the degree of these changes is assumed to be associated with the relative degree of risk.

The development of the 1997 risk analysis was based on the following key assumptions:

- seral stage distribution is a reasonable indicator of disturbance regime (e.g. forest fire frequency and size), and availability of landscape level habitats.
- risk to biodiversity increases as seral stage distributions move away from natural ranges; the closer timber harvesting practices emulate natural disturbance regimes the less risk there will be to eliminating naturally occurring species and compromising ecosystem function (see Table 2).
- risks to environmental values, including elimination of species and overall disruption of ecosystem function, changes over time. While the impacts of major resource development, such as the past building of dams, are clearly recognized, the analysis must also attempt to consider the long term effects of chronic, cumulative change to the environment.
- risk to species and ecosystem function exists along a continuum which can be difficult to quantify. As a result, professional judgments were necessary to define classes for the sake of comparison and also communication to the public and decision-makers. Five classes of risk from very low to very high risk are defined below.
- thresholds exist which, once crossed, make it impossible for some species to recover and extirpation occurs (i.e. local extinctions); thresholds vary by species and ecosystem, but tend to be more frequent as the degree of environmental change from those conditions a species is adapted to increases.
- risk to environmental values also varies depending on the scale of area being analyzed. As with the timber supply, analysis at a regional scale tends to indicate more moderate results as the more extreme situations are rolled into the larger overall context.

Methodology

Stand-replacement return intervals and calculation methods defined by the FPC Biodiversity Guidebook were used to define natural levels of seral stage distribution. The analysis is conducted by landscape

units (or groups of watersheds) divided into individual vegetation zones (BEC units). The timber analysis, based on modeling of guidelines in the various management scenarios, provided data regarding the areas of young, mature and old stands projected to be present in the land units at selected time intervals (see below). The seral stage distribution changes resulting from the projected timber harvesting activities were then evaluated against the estimated natural distributions expected to result from natural disturbance.

In order to conduct this analysis, the following additional assumptions were made to address factors which are difficult to predict:

- trees are likely to be harvested more quickly on private land than managed Crown land. Also, as there are currently no rules to protect riparian areas or threatened species on private land, the risk for such values is increased;
- the land which is not available for harvesting (the non-contributing land base) is assumed to revert to the natural levels of young, mature and old trees over a 70 year period. This assumption was necessary because the timber analysis outputs do not include potential changes to the non-contributing land base due to natural disturbances (such as forest fires). Instead, the timber analysis assumes such areas continue to grow forever.
- over the long term (100 years) at least 8% of the timber harvesting land base will be permanently removed from forested habitat due to roads and other disturbance
- existing inventories and information generated through the timber analysis are reasonable indicators of present and projected future forest stands with harvesting under the FPC and draft MAC strategy. The environmental analysis uses the timber projections in ways which have previously not been required for timber analysis. Therefore, the limitations in the timber analysis, including the accuracy of the forest inventory and assumptions which were built in to meet the needs of the environmental analysis, affect the overall projections for the environmental values.

Habitat-related risk to biodiversity was assessed at four times: the current situation or year 0, as well as 20, 70 and 250 years into the future. The year 250 analysis is a long-term projection, rather than a particular point in time. The relative risk to habitat values was then mapped for each of the time periods to depiction variation across the study area and through time (see Figures 1-4, colour maps indicate five classes; on black and white maps H = H+VH, L = L+VL). The following definitions provide likely outcomes for the range of risk indicated:

- ***Very low risk***: most populations likely to remain stable, or possibly increase where habitat restoration is successful; likely to be multiple areas of each habitat type which will allow habitats to withstand changes due to all but the most catastrophic natural stand-replacing events (e.g. unusually extensive forest fires); where local extirpations occur, connectivity (continuity of habitats) will likely allow for re-establishment of replacement populations.

- ***Low risk***: some populations likely to remain stable, or possibly increase where habitat restoration is successful; some populations dependent on habitats in short supply may decline; likely to be multiple areas of each habitat types which will allow habitats to withstand changes due to most natural stand-replacing events; where local extirpations occur, connectivity may allow for re-establishment of replacement populations.

- ***Moderate risk***: likely to result in reductions in some local populations with others remaining stable; local extirpations are possible where populations are left vulnerable to predators or other increased stress; may be sufficient redundancy in habitats to withstand changes due to most natural stand-replacing events; where extensive areas of young forest are present, these will create imbalances in habitat over time (e.g. 'boom and bust' feeding areas for grizzly bears); re-establishment of locally extirpated populations may be limited by lack of connectivity.

- ***High risk***: likely to result in significant declines in some populations with some local extirpations due to the lack of mature and old forests; the lack of redundancy in habitats will mean that any changes due to natural forest stand replacing events will likely result in further local extirpations; extensive areas of young forests will create imbalances in habitat over time; may contribute to semi-permanent and/or regional extirpations if risk level is long-lasting and/or covers a significant portion of a given population's range;

- ***Very high risk***: major reductions are likely in populations that are dependent on mature and/or old forest stands; many local extirpations; extensive areas of younger trees will create imbalances in habitat over time (e.g., 'boom and bust' feeding areas for grizzly bears); significant potential for contributing to permanent and/or regional extirpations or extinctions if risk level is long-lasting and/or the area at risk covers a significant portion of a given population's range.

The assessment of the final strategy conducted by the Technical Team followed the same methodology for analyzing biodiversity impacts, however with less extensive numerical analysis. Tree Farm Licence 56 was used as the test case for the new biodiversity management approach, and the seral age distributions created by this approach over time were assessed visually by the Technical Team, and numerically in a preliminary fashion by the analyst. Because of the simlarity of the units, this assessment was also seen to be appropriate for Tree Farm License 55. Assessment of the impacts of the revised moose management guidelines was based on extensive literature research and discussions with moose management specialists. The risk rating categories proposed above were used in the final assessment.

3.3 Results

The blended results of the two original analyses are summarized in the following sections and in Table 3. The maps in Figures 1-4 show the results of the 1997 analysis. The two analysis methods generally provided similar trends of habitat-related risks to biodiversity and other environmental values. However, there were subtle differences, mainly reflecting the differences in approach. The 1997 analysis tended to show lower risks in areas with extensive inoperable (i.e. at higher elevations) forests and higher risks in areas with minimal inoperable forest. The 1997 analysis also demonstrated how risk can change over time as forests mature in some areas and harvesting proceeds in other areas.

Before FPC

Cumulative impacts of past development, lack of management guidelines for seral stage distribution and habitat retention create high to very high risk for environmental values over most of the planning area. Poorly distributed Protected Areas (i.e. Federal Parks) offer the only areas of low risk management.

1. General Biodiversity

a) Representative Ecosystems

The protection of viable representative examples of the natural diversity of ecosystems provides for ecosystem health and maintenance of biodiversity. Under the conditions Before FPC,there is a high to very high risk to general biodiversity in the planning area. The total protected area for the Revelstoke planning area is 5.1 %; however, many of the BEC units are not well represented within the protected areas. All BEC units within the BBT and CCM both have less than 1% protection; the ICH zone within the NKM has 6.0%, the ESSF 8.5% and the AT 11.7%. Reservoirs, forest harvesting, transportation corridors, and settlement areas have resulted in extensive loss of low elevation habitat. Areas outside of protected areas are generally at high risk except visual corridors along Highway 1 and where there are extensive areas of inoperable forests.

b)Regional Connectivity

Regional connectivity provides opportunities for species movement and genetic exchange across a broad distribution of ecosystems, within and between resource management units. Under the 1997 management regime, regional connectivity is limited within the planning area resulting in a very high risk to general biodiversity of the area. Reservoirs, settlement areas, low elevation forest harvesting and highway/railroad corridors severely compromise regional connectivity resulting in a fragmentation and/or isolation of regional ecosystems.

2. Major Wildlife Species Habitat

Mountain caribou, grizzly bears and ungulates are important species to the planning area and the maintenance of their habitat is fundamental to their viability. The 1997 management regime places the habitat of both the Revelstoke and Monashee caribou populations at a very high risk, and grizzly bear habitat-related risk at high to very high risk. In general, there are minimal management guidelines pertaining to grizzly bear or caribou habitat management.

Winter range is the most common limiting factor for ungulate species, such as moose and deer. Under the current regime there is high to very high risk to ungulate winter range habitat. There are minimal guidelines for management of winter range for these species, and significant cumulative impacts due to habitat loss resulting from reservoir flooding.

3. Fisheries

For regionally significant fisheries the focus is on watershed management and stream habitat. Currently there is a high to very high risk to fisheries populations. There are minimal management guidelines, limited riparian protection, no ECA guidelines and significant cumulative impacts due to habitat loss resulting from reservoir flooding.

FPC Estimate

The FPC estimate is an improvement over the Before FPC or the 1997 management regime with respect to the key environmental indicators. However, it does not meet the low risk management objectives for any of the key environmental values determined in the benchmark management regime. Biodiversity and riparian guidelines have improved seral stage distribution and connectivity. The effectiveness of the

FPC is reduced at present by the lack of adequately defined guidelines for a number of environmental habitat values (e.g. retention of coarse woody debris, Identified Wildlife and regionally significant fisheries).

1. General Biodiversity

a) Representative Ecosystems

Under the FPC estimate, the risk to general biodiversity of the planning area is decreased from Before FPC, but still remains moderate to high.

The total protected area for the Revelstoke Planning area remains unchanged from the previous scenario. However, the implementation of the Riparian and Biodiversity Guidelines of the FPC decrease risk in areas outside Protected Areas. Riparian reserves are implemented along major stream corridors, and there are significant improvements in retention of mature and old forests in Intermediate and High emphasis biodiversity areas. Deployment of High and Intermediate biodiversity primarily at lower elevations partially compensates for minimal representation in protected areas. Significant areas of flooded habitats, private land with no management guidelines and Low emphasis biodiversity still contribute to high levels of risk in many areas.

Summary:

- NKM: ICH some High Biodiversity, but also significant private land;
- CCM: ICH some Intermediate Biodiversity;
- ESSF mostly Low Biodiversity, but extensive inoperable
- BBT: some Intermediate Biodiversity management

b) Regional Connectivity

Regional connectivity under the FPC estimate has improved over Before FPC, and therefore reduces the risk to general biodiversity. However, there is still a moderate to high risk in the NKM and CCM due to distribution of Intermediate and Low emphasis biodiversity guidelines and private lands in mapped connectivity areas. In the BBT there is a high risk due to the lack of High emphasis biodiversity.

2. Major Wildlife Species Habitat

With the FPC estimate, the habitat risk to the Monashee caribou population remains at a very high risk. All of the Monashee caribou habitat is managed at Low emphasis biodiversity with no caribou guidelines. The concentration of Intermediate and High emphasis options in the Revelstoke caribou population habitat provides for a moderate to high habitat risk for this population, showing a significant improvement over Before FPC.

Habitat risk for grizzly bear is also reduced in the FPC estimate mainly due to the implementation of the riparian guidelines, biodiversity guidelines and improved seral stage distribution. Lack of access controls and avalanche track management still contribute to a high level of habitat risk.

Under the FPC estimate risk to ungulate winter range is reduced significantly due to improvements in seral stage distribution. Ungulate winter range habitat risk is low to moderate in all of the planning area. The primary limitations are lack of specific guidelines, previous impacts due to flooding of habitat and un-regulated private lands.

3. Fisheries

The implementation of FPC riparian protection, terrain stability assessments and watershed assessments results in moderate risk in most parts of the planning area. Increased retention of mature and old stands resulting from deployment of Intermediate and High biodiversity emphases reduce the risk of extreme flow events and channel instability in some areas. The lack of specific ECA targets, transportation and settlement corridors and significant cumulative impacts due to habitat loss resulting from reservoir flooding still result in high risks in some areas.

Draft MAC Strategy

The draft MAC strategy is a significant improvement over Before FPC with respect to all the key environmental indicators. The draft MAC strategy shows reduced risk compared to the FPC estimate for caribou, grizzly bears and ungulate winter ranges due to improved guideline deployment, but may result in increased risk to general biodiversity in some areas due to the reduced deployment of Intermediate emphasis biodiversity. The draft MAC strategy does not meet the low risk management objectives for any of the key environmental values determined in the benchmark management regime.

The poor distribution of protected areas remains unchanged and this combined with a lack of high emphasis biodiversity management in mapped connectivity corridors still leaves significant risk for some species (e.g. those requiring old growth habitats, regionally connectivity and coarse woody debris). The ultimate risk levels for grizzly bears and other wide ranging carnivores depend on the outcome of access management planning at a local level.

The four habitat risk maps in figures 3.1-3.4 show the geographic distribution of habitat-related risk and changes through time. The maps indicate that most of the risk occurs at the lower elevations, in areas with extensive private land and minimal areas of inoperable forest. Areas of low risk tend to be in areas with protected areas, caribou and/or High emphasis biodiversity guidelines and/or extensive inoperable.

1. General Biodiversity

a) Representative Ecosystems

Under the draft MAC strategy, the risk to general biodiversity of the planning area is decreased from Before FPC, but is unchanged from the FPC, remaining moderate to high. The total protected area for the Revelstoke planning area remains unchanged from Before FPC and FPC at 5.1 %, with a poor distribution.

However, the implementation of the caribou, riparian and a portion of biodiversity guidelines of the FPC decrease risk in areas outside Protected Areas, compared to Before FPC. Riparian reserves are implemented along major stream corridors, and there are significant improvements in retention of mature and old forests in Intermediate and High emphasis biodiversity areas. Deployment of High and Intermediate biodiversity primarily at lower elevations partially compensates for minimal representation in protected areas.

Areas managed for mountain caribou contribute to the maintenance of biodiversity where applied. However, the very limited percentages of Intermediate and High emphasis biodiversity, and their

geographic overlap with caribou guidelines, reduces the potential gains to biodiversity in the draft MAC strategy when compared to the FPC estimate. Significant areas of flooded habitats, private land with no management guidelines and Low emphasis biodiversity still contribute to high levels of risk in many areas. The reduction in Intermediate biodiversity below FPC recommended levels, increases risks to general biodiversity over the FPC estimate in some locations.

Summary by Ecosection:

- NKM: ICH some High Biodiversity, but also significant private land;
- ESSF mostly Low Biodiversity, but extensive inoperable;
- CCM: ICH some Intermediate Biodiversity;
- BBT: some Intermediate Biodiversity management

b) Regional Connectivity

Regional connectivity under the draft MAC strategy has improved over Before FPC, and therefore reduces the risk to general biodiversity. However, there is still a moderate to high risk in the NKM and CCM due to distribution of Low and Intermediate emphasis biodiversity guidelines and private lands in mapped connectivity areas. In the BBT there is a high risk due to the lack of High emphasis biodiversity. Connectivity is reduced in some areas in relation to the FPC estimate due to reduced area of Intermediate biodiversity emphasis.

2. Major Wildlife Species Habitat

With the draft MAC strategy, the application of caribou habitat guidelines (often in combination with Intermediate and High emphasis biodiversity options) provides for a moderate habitat risk for the Revelstoke caribou population, showing a significant improvement over Before FPC and slight increase over the FPC estimate. The ultimate long term level of risk to caribou will also depend on the success of managing access controls and maintaining connectivity between key habits, which could not be adequately assessed in this analysis. Another challenge will be striking a balance between caribou and other ungulates and their associated predators.

Habitat risk to the Monashee caribou population remains at a very high risk, as all this population's habitat within the planning area is being managed at Low emphasis biodiversity with no caribou guidelines. Because most of the Monashee population's habitat is located in the Kamloops Forest Region, an overall assessment of this herd's habitat risk would require further analysis of habitat management in the Kamloops Region. This was outside the scope of this analysis.

Habitat risk for grizzly bear in the draft MAC strategy is greatly reduced over Before FPC, and potentially significantly reduced below the FPC estimate. The long term risk level in this scenario will depend on the outcome of local access management plans. With adequate access management the risk should be low to moderate, but without adequate access management the risk will be moderate to high.

The deployment of regional ungulate winter range guidelines in combination with improved seral stage distribution in the proposed MAC plan has resulted in low risk to ungulate winter range habitat in the majority of the planning area. The only remaining limitations are previous impacts due to flooding of habitat and un-regulated private lands.

3. Fisheries

Within the draft MAC strategy, the implementation of FPC riparian protection, terrain stability assessments and watershed assessments results in moderate risk in most parts of the planning area. Increased retention of mature and old stands resulting from deployment of Intermediate and High biodiversity emphases and caribou guidelines reduce the risk of extreme flow events and channel instability in some areas. The specific recommendations for watershed assessments in the draft MAC strategy should further reduce risk in those areas. However, the lack of specific ECA targets, transportation and settlement corridors and significant cumulative impacts due to habitat loss resulting from reservoir flooding still result in high risks in some areas.

Final MAC Strategy

The final MAC strategy follows the draft strategy with the exception of the following:

- **increased operable area** which means more of the forested landscape will be harvested over time than projected in the 1996 and 1997 analyses

- **revised biodiversity management approaches** for Tree Farm Licenses 55 and 56 which include initial drawdown of the mature and old seral age requirements in the small areas of low emphasis biodiversity in these units, and replacement of the maximum block size, green-up and adjacency restrictions with achievement of the spatial distribution of patch sizes recommended in the *Biodiversity Guidebook*

- **revised ungulate management objectives** from ‘maintaining *current* populations by maintaining winter range’ to ‘maintaining *viable* populations by maintaining *critical* winter range’; this has been accomplished by remapping the winter range to remove non-critical areas, with only minor revisions to deer winter range and more substantial revisions to moose winter range; moose management guidelines for Tree Farm Licenses 55 and 56 have also been revised to require 34% forest cover of trees at least 100 years old, provided the desired habitat attributes are provided, compared to 40% forest cover of trees at least 120 years old in the draft strategy.

Generally the impact assessment for the final MAC strategy follows the assessment for the draft strategy, which indicated a significant improvement over Before FPC with respect to all the key environmental indicators as well as reduced risk compared to the FPC estimate for caribou, grizzly bears and ungulate winter ranges due to improved guideline deployment. There is increased risk to moose in Tree Farm Licenses 55 and 56, however the wide-ranging habits of this species, and their reproductive capacity offsets this risk somewhat.

The poor distribution of protected areas remains unchanged and this combined with a lack of high emphasis biodiversity management in mapped connectivity corridors still leaves significant risk for some species (e.g. those requiring old growth habitats, regional connectivity and coarse woody debris). The ultimate risk levels for grizzly bears and other-wide ranging carnivores depend on the outcome of access management planning at a local level.

1. General Biodiversity

a) Representative Ecosystems

Under the final MAC strategy, the risk to general biodiversity of the planning area remains moderate to high. The total protected area for the Revelstoke planning area remains at 5.1 %, with poor distribution.

However, the implementation of the caribou, riparian and a portion of biodiversity guidelines of the FPC decrease risk in areas outside Protected Areas. Riparian reserves are implemented along major stream corridors, and there are significant improvements in retention of mature and old forests in Intermediate and High emphasis biodiversity areas. Deployment of High and Intermediate biodiversity primarily at lower elevations partially compensates for minimal representation in protected areas. However the very limited percentages of Intermediate and High emphasis biodiversity contribute to high levels of risk in many areas. The addition of inoperable areas to the operable landbase creates further risk, even though these areas are primarily Low emphasis biodiversity. The revised biodiversity management approaches for Tree Farm Licenses 55 and 56 will create some areas of large, aggregated patches, up to 250 hectares, which should permit retention of large areas of mature and old forests, which has the potential to reduce the risk. As this approach is as yet untested, it was not assessed to reduce the risk to general biodiversity below the initial moderate – high risk assessment.

b) Regional Connectivity

Regional connectivity under the final MAC strategy has not changed from the draft startegy, thus the assesment of moderate to high risk provided for the draft MAC strategy stands, primarily due to limited distribution of Intermediate biodiversity emphasis and extensive private lands in mapped connectivity areas.

2. Major Wildlife Species Habitat

As caribou management practices have not been adjusted in the final MAC strategy, the moderate risk assessment from the draft strategy for the Revelstoke herd applies. The expansion of the operable area, often into the high elevation caribou habitat in the ESSF, does increase the risk somewhat, and the current uncertainty about management practices in areas above the 1994 operability creates additional uncertainty. In addition, managing access controls and maintaining connectivity between key habitats remains key to the success of this strategy. The assessment for the Monashee herd remains at high risk, although a full assessment requires examination of the habitat practices in the Kamloops Forest Region, where most of the habitat is located, which was outside the scope of this analysis.

With regard to grizzly bears, the addition of operable area may increase risk somewhat, while the aggregated patch sizes may reduce risk by facilitating access management. The long term risk level continues to depend on the outcome of local access management plans. With adequate access management the risk should be low to moderate, but without adequate access management the risk will be moderate to high.

The reduction in mapped critical deer winter range habitat does not change the change the initial low risk rating because of the very small change in the mapped area. The revised mapping of critical winter ranges, and the reduction in forest cover requirements for moose creates a moderate risk to this species. However the wide-ranging habits of this species, and their reproductive capacity offsets this risk somewhat.

3. Fisheries

As the changes to the final MAC strategy do not affect fisheries management, the moderate risk assessment for the draft strategy applies.

Figure 3.1 Predicted Biodiversity Habitat Risks Resulting from Changes to Seral Stage Distribution – 0 Years

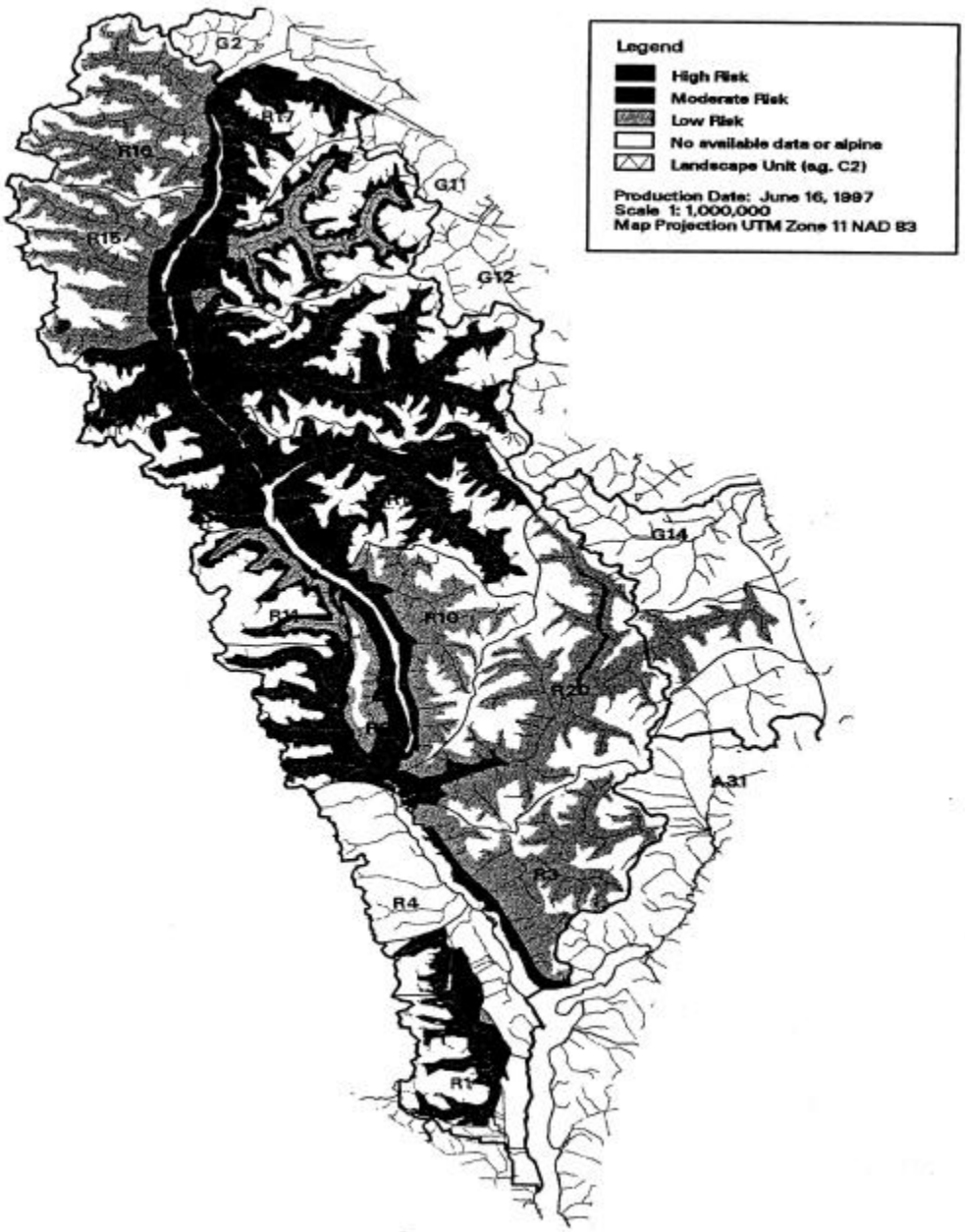


Figure 3.2 Predicted Biodiversity Habitat Risks Resulting from Changes to Seral Stage Distribution – Year 20

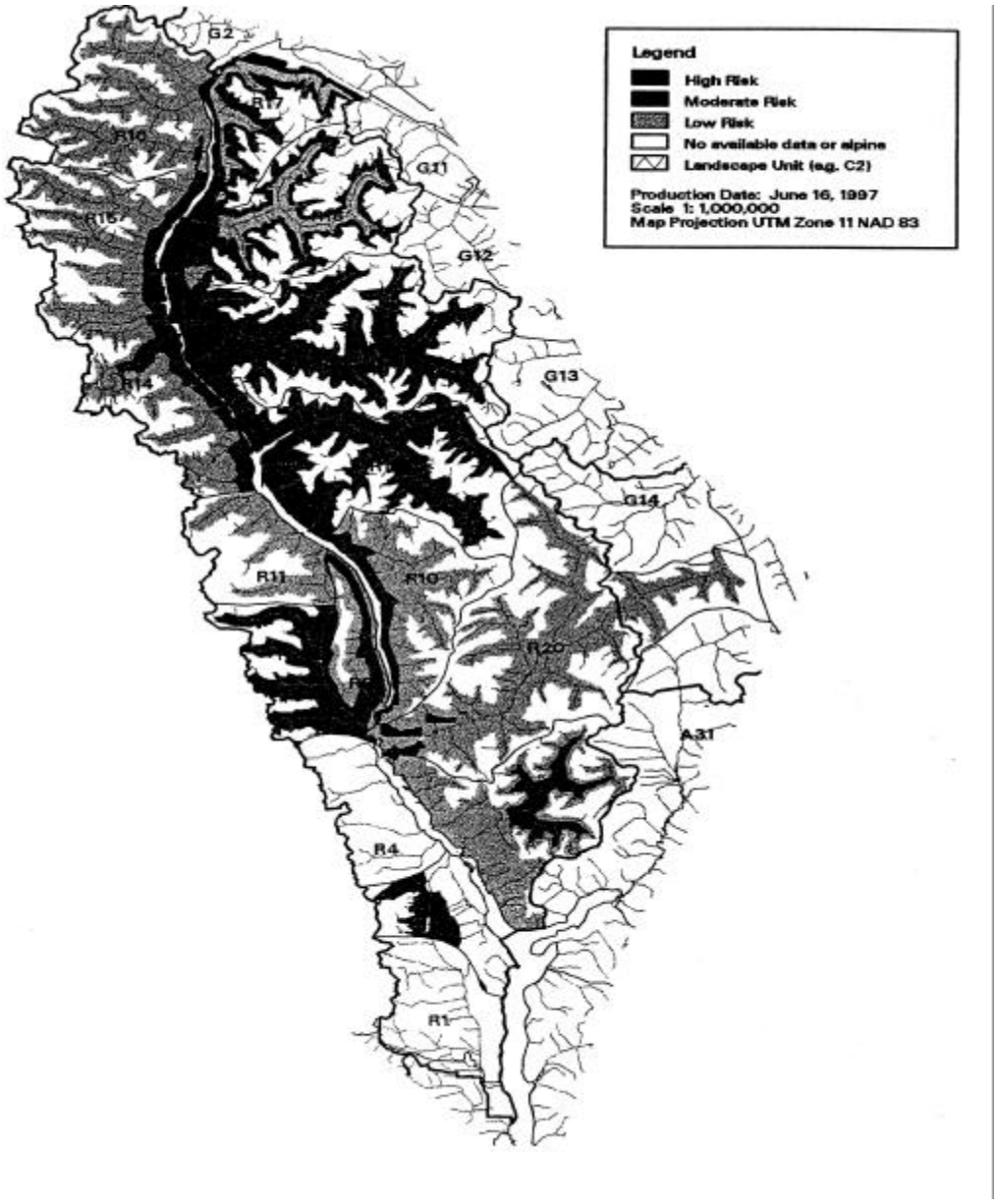


Figure 3.3 Predicted Biodiversity Habitat Risks Resulting from Changes to Seral Stage Distribution – Year 70

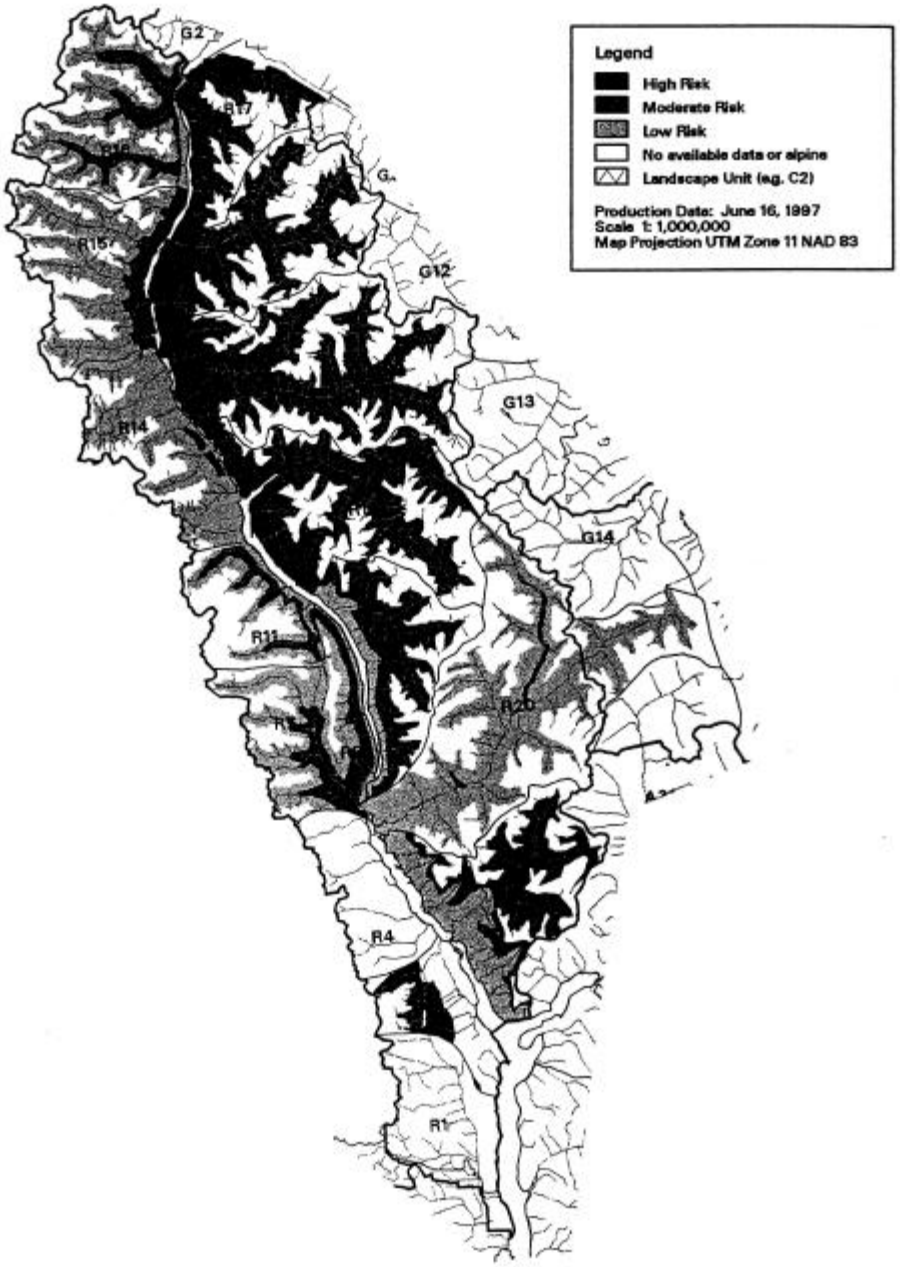
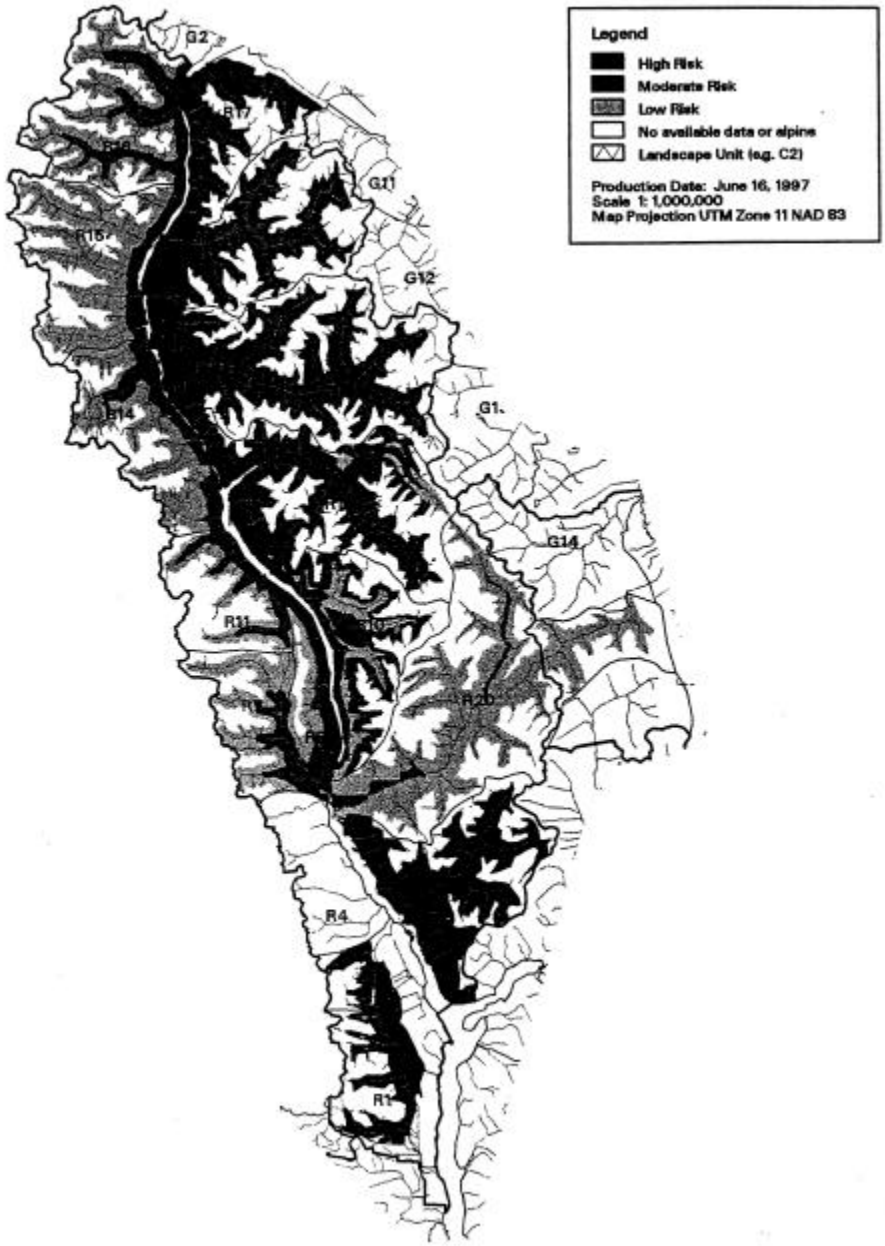


Figure 3.4 Predicted Biodiversity Habitat Risks Resulting from Changes to Seral Stage Distribution – 250 Years



4. Forestry Sector

4.1 Profile of Forest Industry and Employment

Forestry based activities have long been a major component of the Revelstoke economy. Analysis of 1996 Census information by the Ministry of Finance and Corporate Relations indicates that forestry employment, including resource management, logging and wood manufacturing, accounts for 24% of the District's basic employment and 22% of total after tax basic income.

Forestry employment is largely reliant on timber harvested on the District's Crown land base. Harvesting occurs within the Revelstoke Timber Supply Area (TSA), and three tree farm licenses (TFL) under renewable forest licenses and under Small Business Forest Enterprise Program. TFL 23 is held by Pope and Talbot, TFL 55 is held by Evans Forest Products Ltd., and TFL 56 is held by the Revelstoke Community Forest Corporation. In the last Timber Supply Review, the Chief Forester reduced the District's total annual harvest (TSA and TFL) for the next 5 years from about 530,000 cubic metres (m^3) to 467,500 m^3 per year, about a 12% reduction.

Approximately 60% of the District's timber harvest is processed in Revelstoke, and the remaining harvest is processed in saw mills and pulp mills outside the District (e.g. at the Malakwa mill). Presently, there are three saw mills (Downie Timber Ltd., Joe Kozek Sawmills Ltd., and J.D Mills Ltd.) and one pole yard (Bell Pole) based in Revelstoke. Operating at capacity, the Kozak and Downie mills require in the order of 390-440,000 m^3 of fibre (with the Downie operation accounting for approximately 90% of this)[2]. About 270,000 m^3 of the Revelstoke's mill requirements are met by the District harvest. This proportion varies as some of the harvest under the Small Business Program and one half of the TFL 56 harvest is sold competitively. The remainder is brought in from outside the District (e.g. Golden TSA, and Alberta - although there are indications that the latter is no longer an important source).

District harvest is also shipped outside the District for processing. Evans Forest Products Ltd. transports logs from TFL 55 to its Malakwa mill (about 90,000 m^3 including pulp logs). About 25% of the District harvest profile is pulp logs, which are sold to chipping plants and pulp mills for further processing. By-product chips from the local mills are also sold to regional pulp mills.

The District is located in the interior wet belt. Harvesting conditions in the area are more typical of that on the coast, but without the high quality timber of the coastal forests and located further from markets. Over recent years, the industry has been required to shift from ground to cable harvesting systems, which substantially increased logging costs. Concerns have been expressed that, although there have recently been changes to the system, the current stumpage system does not adequately take this higher cost into account.

The cost increase has been compounded in recent years by increasing costs which have affected the entire provincial industry. These increased costs include higher costs of labour and capital, increased

[2] There issalso one shake and shingle and about a half a dozen re-manufacturing operations in the District. Their fibre supply requirements (when operational) are sufficiently small that they could be accommodated within the general range indicated above.

forest management costs, and higher stumpage and royalty charges. A recent study[3] completed for the Ministry of Forest estimated that delivered wood costs had increased on average across the province by some $37/m^3$ between 1992 and 1996 - ranging from a high of $46 on the Coast and a low of $32 in the Southern Interior. Based on data from local operators, between 1992 - 1996 these changes combined with the shift in harvesting practices, resulted in a 65% increase in harvesting costs (from approximately $47.00 to $78.00/m3). Local operators indicate their 1999 costs are 10% higher than the average southern interior costs.

In addition, the industry must also remove pulp logs, growing with valuable sawlogs, which amount to approximately 25% of the timber harvested in the area. These low value pulp logs have been harvested at an $8/cubic metre ($m^3$) average loss during 1992-1995, based on local industry data. For local operators to continue to be profitable, this loss must be covered by profit from the sawlog harvest.

The number of forest industry jobs held by Revelstoke residents which are supported by District and non-District Crown harvest and the employment outside the District supported by the District's harvest, is summarised in Table 4.1. There are some 300 person years of employment involved in harvesting and road building and maintenance. The logging coefficient of 0.44 jobs per thousand cubic metres is based on the average of Downie and Evans contractors and includes harvesting of Downie's forest license in the Golden TSA. Relative to interior operators, the District's harvesting labour coefficient is high (i.e. more labour is required to harvest a thousand cubic metres), which reflects the difficult operating terrain and more labour intensive harvesting methods.

Silviculture and forestry refers to a range of forest management activities such as surveys, site preparation, planting, brushing/weeding, thinning, pruning, etc. Presently, both the ministry and licensees conduct "basic silviculture" on Crown lands. It is estimated that there are some 35 - 60 person years of employment involved in this basic silviculture activities.

Recently, various silviculture, watershed restoration, and training projects have begun, funded by Forest Renewal BC (FRBC). These projects are expected to support in the order of 5 - 15 person years of employment. Most silviculture work is closely related to the number of hectares treated (rather than harvest levels). The area treated corresponding to the current employment level is some 2,500 hectares (most lands will be treated several times). An employment value of 70 person years was used to derive the employment coefficient of 28 person years per 1000 hectares treated.

The District's larger operations are Downie Timber Ltd. (200 persons-years), Kozek (20-person years) and Bell Pole (15 person-years). In addition, there are about 25 person years of employment in several re-manufacturing operations including J.D. Mills. There is also one shake and shingle operation, Cascade Cedar, which do not operate continuously. These re-manufacturing operations meet their lumber needs both from lumber processed in Revelstoke and further afield. Processing of the District's harvest has increased since Downie Timber and Selkirk Specialty Wood constructed and now operate a re-manufacturing plant adjacent to Downie Timber's mill. The plant employs 60 - 70 individuals. There is also two song board plants in operation.

[3] **Financial State of the Forest Industry and Delivered Wood Cost Drivers**, KPMG; Perrin, Thorau & Associates Ltd.; and T.A. Simons. Prepared for B.C. Ministry of Forests, April 1997.

Table 4.1 Summary of Forest Industry Employment

	Current employment[1] (person years)	Person Years/'000 cubic metres harvested
Revelstoke District		
• Harvesting	300	0.44
• Log and chip hauling	30-40	0.05
• Silviculture/Forestry	40 - 75	n/a[2]
• Major processors • small processors	235 25	0.50
Total Employment	**640 - 675[3]**	**0.99**
Rest of Province (supported by District harvest)		
• Malakwa mill	36	0.48
• pulp mills	60	0.3[4]
Total Employment	**96**	**0.78**

1 Includes resident employment relying on Non-District timber

2 Calculated at 28 person- years per 1000 ha. treated,.

3. Does not include employment with the Ministry of Forest district office in Revelstoke of 44 person years.

4. Person years per solid wood equivalent of pulp logs and chips into the pulp mill.

District timber also supports forest industry employment of persons living outside the District, notably at Evans Forest Product's Eagle River cedar mill at Malakwa. Full time mill employment at full capacity is reported to be about 130 persons (110 hourly and 20 salaried). The company presently harvests about 90,000m^3 from TFL 55. The cedar harvest is used by the mill and non-cedar logs are exchanged with mills throughout the interior for cedar. Whole pulp logs are transported to a chipping operation in Cache Creek. District wood volume directly, or indirectly (through trades) accounts for about one third of the mill's input volume. Similarly, pulp logs harvested under other licenses and chips from the District's mills support employment in the pulp industry outside of the district.

Based on the 1996 Census data it is estimated that District's forest industry employees' before tax income is in the order of $29.38 million per year (average forest industry annual after tax income was about $42,400 per person-year in 1995). A significant portion of this income is re-spent in the District creating additional employment in consumer oriented businesses. In addition, forest based businesses purchase local goods and services. Locally, some 260 person years of indirect employment is estimated to be dependent on the District's forest industry. Further, resident spending outside the District supports employment in the rest of province. The spending by employees at the Malakwa mill (indications are that they are not residents of the Revelstoke District) and pulp mills have similar economic ramifications in the respective region and provincially.

The coefficients presented in the right column of Table 4.1 will assist in forecasting the level of employment "at risk", to be discussed later.

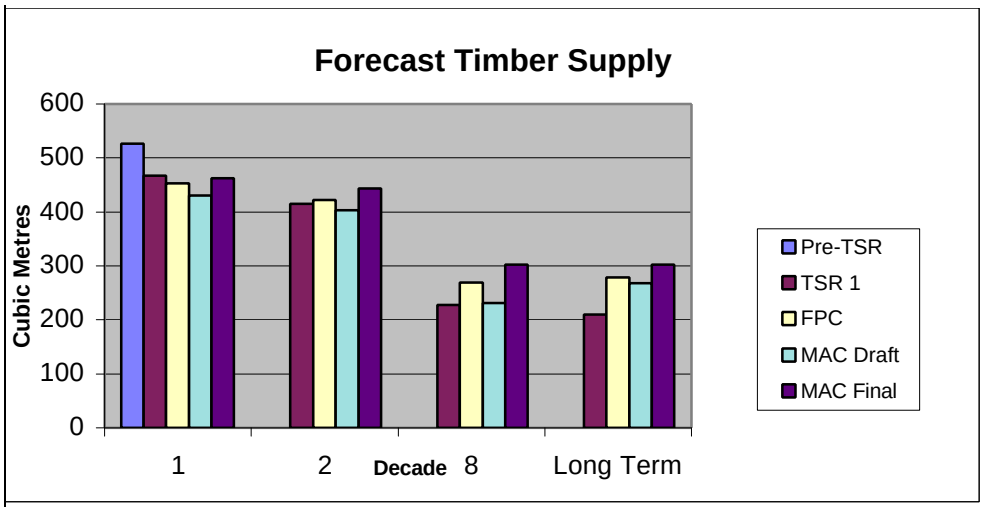
District harvest also contributes to provincial government revenue with various taxes and stumpage fees. In 1996 the Crown collected about $4.8 million in stumpage payments, at an average value of $10.8/m^3. This is a relatively low average stumpage value, reflecting the large share of high cost and/or low grade wood in the District's harvest profile[4].

4.2 Timber Harvesting Scenarios

As noted above, annual allowable harvest volumes for the Revelstoke District's TSA and TFLs have been reduced in aggregate by some 12% as a result of the first Timber Supply Review (TSR 1) conducted from 1993-1997. The provincial government has also introduced new forest management practices with the enactment of the Forest Practices Code (FPC) which will also affect the volume of timber available for harvest.

Figure 4.2 provides the Ministry of Forests' timber supply forecasts which were used to assess the implications to the local and provincial economies.

Figure 4.2 Timber Supply Forecasts (m^3)



Source: Ministry of Forests

Notes
1. Includes partition cut of 10,000 m3
2. The impact of the draft MAC Strategy could not be modelled on this portion of TFL 23, so the harvest level was held at current level. However, the Strategy is expected to reduce the volume available for harvest. Thus the comparison should be viewed as a comparison between timbers supply from TFLs 55 and 56 and the TSA only.

Under all forecasts, the District's timber harvest is projected to decline. The Before FPC analysis indicates a higher rate of decline than the FPC estimate or draft MAC Strategy, resulting in the longer

[4] Lower quality wood and/or costs that exceed the provincial average results in a lower average stumpage rate for the Revelstoke district given the current method for determining stumpage rates in British Columbia (Comparative Value Pricing System). As the method determines relative stumpage rates so as to achieve an overall "target rate" ($/m^3), province wide cost increases (for example, implementation of the *Forest Practices Code*) would not materially effect stumpage rates.

term timber supply under both the FPC estimate and draft MAC Strategy being higher than under TSR 1. However it should be noted that, given the changes since the first TSR, the determination at the next TSR (in 1999) will incorporate FPC requirements. That is, the Before FPC harvest forecast is presented here as a point of reference, but is no longer a viable 'base case' or future scenario, given the policy and legislative changes that have occurred.

The estimate of the implications of FPC shows only a marginal difference (only around 1%) in timber supply over Before FPC in the next three decade (comparing decade to decade).

The draft MAC Strategy includes both FPC requirements as well as additional management for other values. This scenario results in a 7% decline in forecast timber supply in the first decade over the FPC estimate, with the rate of decline thereafter in line with the FPC estimate for the first 5 decades.

The final MAC strategy also includes FPC requirements and additional management for other values. The timber supply forecast is higher than the draft MAC strategy forecasts primarily because of the incorporation of previously inoperable areas and new information on the growth rates of regenerated forests, as well as revised biodiversity and ungulate management practices. The final strategy results in an average 3% decline in timber supply in the first decade, with no change for the Timber Supply Area and Tree Farm License 23, and 8 and 6 per cent reductions for Tree Farm Licenses 55 and 56 respectively. This is followed by an additional 4 per cent decline in the next decade, with a total 27 per cent decline in 80 years, continuing over the long term.

4.3 Employment, Industry Viability and Revenue Impacts

A reduction in the District's harvest level will affect job opportunities and incomes, for both residents of Revelstoke District and elsewhere in the province. The question is, how large might this effect be? The degree to which this question can be answered depends on our understanding of the local economy, how it is linked to the regional and provincial economies, as well as the alternatives available to the various agents (individuals, companies, government agencies) affected by the change. The best available information and economic models were used here to estimate the potential effects. Nevertheless there are gaps and limitations. That is, the estimates of impacts shown below are indicative of the order of magnitude of the potential effect, and should not be interpreted as precise measurement.

Four other general caveats are:

- The question "how large might the effect be" is addressed as if only the District's harvest level changes, and everything else remains static. This, of course, is not the case. There are many other factors that will influence actual economic activity of the District's forest industries (e.g. the cyclical demand for wood products, the purchase of wood outside the District, previously uneconomic wood becoming economic due to technical change, government policy, re-training programs, etc.). These factors may compound or mitigate the effects caused by the changing harvest level. In reality, the balance of these many influences is what will be felt in the District.

- The analysis assumes that fibre flows into and out of the district are constant. However, given that the timber supply within the Nelson Forest Region is anticipated to decline as a result of the implementation of the Kootenay Boundary Land Use Plan, the demand for timber in these areas may affect current fibre flows and therefore affect where employment impacts from the declining harvest levels are felt.

- The economic impact estimate does not address the process and time frame over which the change might occur. This depends on a number of factors. For example, the presently approved harvest level for the District is some 60,000 m3 below the previous level but there has been limited evident impact on the local economy. To take account of lags in adjustment, we present the impacts in terms of the likely "near" (i.e. next 1 to 10 years) and the "longer term"(10 to 20 years). Given the rate of social, economic and community change, it would not be particularly meaningful to project impacts beyond this length of time.

- Employment impacts are measured in person years, but are commonly interpreted as the number of jobs or individuals affected. This is not necessarily the case, as labour and industry may arrange to mitigate the impact on individuals by, for example, reducing the work day, job sharing, reduction in earnings, retraining in other components of the sector, and the like. As well, the impacts may result in a 'threshold effect' which would push the employment impact above the PY estimate.

Methodology

The method that has been used to project economic impacts is to assume that the current employment ratios remain constant. The specific direct employment ratios were presented in Table 4.1. These ratios provide the basis for estimating direct person years of employment "at risk" associated with the change in harvest level. In the short term this approach provides a reasonable estimate, but over the longer term (i.e. greater than 5 years) it may overstate the impact[5]. It is recognised that employment may change in discrete steps due to changes in harvest level (e.g. shift lay-off, mill closure). Such threshold effects are mill specific and difficult to predict.

Direct employment in the harvesting sector is estimated at the total District harvest level. Processing employment assumes that 60% of the District harvest is processed in Revelstoke with the remainder shipped to the Malakwa mill and to pulp mills.

Reductions in forest industry output, wages and employment in the District will ripple through the local and provincial economies. Business suppliers to the forest industry, such as transportation, machine shops, industrial goods are likely to experience a decline in business (these business effects are termed indirect impacts). Similarly, the consumer goods and service industries, which depend on the spending of all affected workers, are likely to be affected (termed induced effects). Here the two effects are collectively referred to as spin-off effects. Methods based on the British Columbia Input Output Model, which is a detailed set of industry and commodity accounting data describing economic flows between sectors, was used to estimate the spin-off effects[6].

For District "spin-off" employment a range is provided to indicate that the magnitude of this effect will depend to a large extent on the response of affected workers to the layoff. Various social assistance programs (e.g. unemployment insurance) mitigate the initial impact of direct job loss as the affected individual may choose to remain in the area and will continue to purchase consumer goods and services (hence continue to support employment in the dependent sectors). This is represented by the lower estimate of employment at risk in the range - which assumes no affected workers move out of the area.

[5] Technical change (embodied in new investment) has historically led to labour productivity gains (hence higher wages), but implies a lower labour to wood harvest ratio.
[6] see *A Provincial Impact Estimation Procedure for British Columbia Forest Sector*, Ministry of Finance and Corporate Relations, February 1996. for a discussion of the methods.

However, affected workers may choose to leave the area to search for alternative employment, which will result in a much greater impact on the dependent sectors. The further reduction in local incomes reduces the dependent jobs toward the upper end of the range. The high end range assumes all affected workers leave the area.

The rest of province employment is composed of employment at the Malakwa mill, pulp mills which process District timber, and the spin-off employment outside of the area.

Harvest reductions will also impact forest sector generated incomes - direct and spin-off, and government revenue, stumpage revenue, corporate income tax, personal income tax, and related taxes. In the case of personal income tax, over time it is likely that most of the individuals affected will again be gainfully employed in the provincial economy (i.e. paying taxes). This is not the case with stumpage revenue and corporate taxes which are directly related to the resource base.

Estimates of the impact on government revenue are based on those taxes closely associated with the harvesting and processing of the timber resource. That is logging tax, corporate tax, electricity tax and sales taxes, and stumpage. The non-stumpage tax revenue estimate is based on a provincial average value of $5.80/m^3 (1993 value). The stumpage revenue is based on a continuation of the District's harvest profile and 1996 stumpage rates. (*Note: stumpage rates for 1998 were examined and are similiar to the rates used in this report so no adjustments were made.)*

The draft report provided incremental effects for the first round of timber supply reviews, the Forest Practices Code and the draft MAC strategy, and cumulative effects of all three initiatives. The analysis of the final MAC strategy only examines the impacts compared to the current allowable annual cut and current practices.

Impacts associated with the Before FPC Analysis

The reduced District harvest levels set by TSR 1 have not yet been reflected in the District's forest industry employment, in part because licensees have flexibility in determining annual harvest levels subject to a 5 year maximum, and the District mills have been purchasing wood outside the District for processing.

Employment:

When the effects of TSR 1 harvest reduction are fully implemented (some 59,000m^3), one would expect a decline in the employment of those involved in harvesting (i.e. loggers) and those businesses servicing harvesting activities. An estimate of these impacts is presented in the first column of Table 4.3 labeled "*Before FPC (change from pre-TSR)"*. In the order of 35 PY of employment in harvesting and silviculture may be at risk in the first decade - equal to around 5% of total Revelstoke forest sector employment. In the second decade, timber supply continues to decline - by almost 53,000 m^3 over the first decade. This will put an additional 30 harvesting and silviculture PYs at risk.

With respect to the District processors, they may be able to secure alternative timber supplies thus lessening the impact on District employment levels. This is why "up to" 20 person years of employment are estimated at risk in the first decade. Nevertheless, to the extent the alternative supplies are drawn away from another BC processor, the jobs at risk is merely shifted out of the District.

However the net decline in forest sector employment will depend on the overall effects of these direct changes, and the offsetting impacts from Forest Renewal BC programs, new value-added initiatives in the area, initiatives under the Jobs and Timber Accord, and, as discussed below, potential opportunities outside current operability lines. It is expected that these offsetting activities will absorb much of the employment impacts under this scenario.

Industry Viability:

In any case, the reduced timber supply will impact milling costs as it is likely the case that the "replacement" wood will be a higher cost. As noted earlier, the Revelstoke area is already a high cost operating area for timber companies, and concerns have been expressed that the current stumpage system does not adequately take this higher cost into account. Having to source higher costs replacement wood puts further pressure on the industry's profitability and increases the risk of a threshold effect, such as a shift reduction. Local mills already purchase a higher than average portion of their wood requirements.

As well, reduction in wood supply is likely to create idle processing capacity and the regional industry will adjust over time to remove this excess capacity. Mills will respond to this in different ways depending on their circumstances. This may, for example, include shift reductions, and the withdrawal of less efficient operations, etc. However, without an in-depth understanding of regional wood flows and the relative competitiveness of local mills, it is difficult to predict when and how mills will respond. Nevertheless, the implementation of the Kootenay-Boundary Land Use Plan which is currently expected to reduce the allowable cut throughout the region suggests increased competition among processors purchasing fibre and some increase in idle capacity across the region.

It may be possible for the timber industry to harvest some of the timber that is currently considered inoperable and not economical to harvest, particularly using helicopter logging. While using helicopters to move timber from the bush is more expensive than cable systems, reductions in road costs, environmental liabilities and stumpage for helicopter logging offset higher yarding and reforestation costs in some cases, especially where high value sawlogs are harvested. In the Revelstoke area, an increasing portion of the timber has been harvested with helicopters in the past two years. This could provide opportunities to offset the fibre reduction in the operable areas. Additional short term fibre opportunities may exist through the rehabilitation of viewscapes.

Revenue Impacts:

Revenue flows within in the community and to the provincial government will also be affected by the reduced harvest levels. Revelstoke forest sector and related spin-off wages are estimated to decline by just over $3 million and stumpage and other harvest related tax revenue are expected to fall by almost $1 million (annual values) in the first decade - this amounts to around 3% of total income and 12% of stumpage and other tax revenues.

Impacts Associated with the FPC Estimate

Relative to the currently approved District harvest level, implementation of FPC estimate is forecast to reduce the aggregate harvest level by only 14,800 m^3 in the first decade - about a 3% decline. In the second decade timber supply is forecast to decline by 31,000 m^3 but this is 6,700 m^3 higher than what it is forecast to have been in the Before FPC analysis.

Employment:

Given these relatively small changes in the forecast harvest levels over the Before FPC analysis, the corresponding *incremental* change in employment is around 10 direct PY at risk in the first decade - about 1.5% of total employment in that sector. Adding spin-off impacts, the total incremental impact is only around 0.5% of total Revelstoke employment, and a similarly small level of employment at risk for the rest of the Province. In the second decade there is a slight increase in direct and spin-off employment levels relative to what would have occurred in that time period under the Before FPC analysis. Forest Renewal BC programs, potential for further new value-added initiatives in the area, and potential opportunities outside current operability lines could together be used to offset much an incremental impact of this size. However there may be difficulties in one-to one matching of affected workers, and the timing of new opportunities may not precisely correspond with the need.

Industry Viability:

The relatively small reduction in timber supply in this scenario could have a cost impact as the reduction increases the need for sourcing alternative supply to maintain production, although incrementally, this likely would be relatively small (given it is only a 3% reduction over TSR 1 levels). Opportunities to harvest outside of current operability lines may be an opportunity to offset this. As well, the FPC is expected to increase costs for enhanced forest management. These increased costs are included in the earlier discussion on the increasing costs of delivered wood in the area and in BC generally.

Revenue Impacts:

Revenue impacts are equally small under this scenario - the reduction in stumpage, other harvest related taxes is only around 3% of current revenues, and total income reduction for the community is less than 1%.

Impacts Associated with the Draft MAC Strategy

The harvest levels under the draft MAC Strategy in the first decade are 22,000 m^3 less than the FPC estimate, and 36,800 m^3 less than the Before FPC analysis. In the second decade, the timber supply is forecast to decline by 28,000 m^3 under the draft MAC Strategy, bringing the timber supply to a level which is a 19,000 m^3 less than under the FPC estimate, and 12,300 less than the Before FPC analysis.

For analytical purposes, it is assumed that the harvest reduction will be distributed proportionately among licensees. However, it is noted that there is greater flexibility in equitably distributing the effect on the TSA forest land, where the license is volume based and operating areas are subject to adjustment. This is not the case for the TFLs. The timber supply analysis indicates that the TSA and TFL 55 take the largest percentage reductions between the FPC estimate and the draft MAC Strategy.

Employment:

Direct (forest sector) incremental Revelstoke employment at risk from the draft MAC Strategy over the FPC estimate is approximately 20 PY in the first decade. This amounts to approximately 3% of total *forest sector* employment.

Another 5 - 10 PY are estimated to be at risk as a result of indirect and induced impacts over the next ten years. The *total incremental Revelstoke* employment (direct, indirect and induced) at risk is less than 1% of *total employment in the Revelstoke area*. Employment impacts may also be felt outside the

Revelstoke area. It is estimated that as many as 20 PY could be at risk in the rest of the province, excluding the Revelstoke area.

In the next 10 - 20 years, the timber supply is forecast to decline further under the draft MAC Strategy, putting as many as an additional 35 direct and spin-off PY at risk. Relative to the FPC estimate, an this is an *incremental* 15 direct PY estimated at risk, with a further 5 - 10 PY at risk as a result of spin off impacts.

As with the other 'scenarios', the net decline in forest sector employment will depend on the overall effects of these direct changes, and the offsetting impacts from Forest Renewal BC programs, potential for further new value-added initiatives in the area, and potential opportunities outside current operability lines. As the impacts are forecast to be phased in over time, it is expected that these offsetting activities will absorb a significant amount of the employment impacts under the draft MAC Strategy. However there are difficulties in one-to one matching of affected workers, and the timing of new opportunities may not precisely correspond with the need.

Industry Viability:

The reduced timber supply will further increase the need to source alternative timber supplies, thus increasing costs and reducing mill profitability. As well, the resource management practices proposed by the MAC for caribou habitats and viewscapes are expected to increase harvesting costs, primarily through increased planning and more harvesting by partial cutting or in small openings. Based on recent harvesting in caribou habitat in the Keystone area, Revelstoke Community Forest Corporation staff estimate these practices increase harvesting costs by approximately 10% for ground-based harvesting and 20% for cable harvesting. However, MAC draft recommendations also include a proposal where, when consistent with resource guidelines, the district manager would consider increased cutblock sizes which will reduce average harvesting costs.

The draft MAC Strategy is consistent with opportunities to use helicopter logging to harvest some of the timber that is currently considered inoperable and not economical to harvest. It is expected that the small openings created by harvesting pockets of high value timber will be compatible with the resource management practices in caribou areas, making it possible to harvest timber from these areas. This may be an option for offsetting some of the reduced timber supply.

Revenue Impacts:

Estimated revenue impacts amount to around 5% of current levels of stumpage and other forest industry taxes, and about 1% of Revelstoke forest sector and spin-off wages.

Impacts Associated with the Final MAC Strategy

Reductions in the near term of 8,000 cubic metres (8%) and 6,000 cubic metres (6%) are forecast for TFLs 55 and 56, respectively, with no reductions to the TSA or TFL 23 compared to curent allowable annual cuts (including partitioned cuts in TFLs 55 and 56). This trend continues for the longer term (10-20 years), with additional 10% reductions forecast for the two TFLs, and no reduction for the TSA and TFL 23. The reasons for the increased timber supply forecasts compared to the draft MAC strategy are outlined in section 4.2.

Employment:

Total direct Revelstoke forest sector employment at risk from the final MAC Strategy is similar to the FPC estimate, or approximately 10 PY in the first decade. This amounts to approximately 1.5% of total *forest sector* employment.

Another 5 - 10 PY are estimated to be at risk as a result of *indirect and induced* impacts over the next ten years. The total employment impact (direct, indirect and induced) at risk is less than 0.5% of total employment in the Revelstoke area. A similar effect is expected on employment generated outside Revelstoke. In the second decade there is a slight increase in direct and spin-off employment levels.

The net decline in forest sector employment will depend on the overall effects of these direct changes, and the offsetting impacts from potential new value-added initiatives in the area and the employment implications of new harvesting practices. As the impacts are forecast to be phased in over time, it is expected that these offsetting activities will absorb a significant amount of the employment impacts under the final MAC Strategy. However there are difficulties in one-to one matching of affected workers, and the timing of new opportunities may not precisely correspond with the need.

Industry Viability:

The reduced timber supply from the two TFLs will further increase the need for local mills to source alternative timber supplies, thus increasing costs and reducing mill profitability. As well, the resource management practices recommended by the MAC for caribou habitats and viewscapes, and the expansion of the operable area to include steeper terrain and poorer quality timber types are expected to increase harvesting costs, primarily through increased planning, more expensive roading and more harvesting by partial cutting or in small openings. Based on recent harvesting in caribou habitat in the Keystone area, Revelstoke Community Forest Corporation staff estimate these practices increase harvesting costs by approximately 10% for ground-based harvesting and 20% for cable harvesting. However, the aggregated patch size recommendations will permit larger cutblocks in some areas of these TFLs which should offset these cost increases somewhat.

There also continues to be substantial uncertainty about whether the timber supply forecasts can be achievaed. Implementation of the revised biodiversity management guidelines on TFLs 55 and 56 has not yet occurred, and may prove infeasible. Also, the large shifts in timber supply forecasts the Committee has received over time, and the very substantial difference in the timber supply review results for the TSA has created legitimate scepticism about the stability of the current forecasts.

Revenue Impacts:

Revenue impacts are small under the final MAC strategy - the reduction in stumpage and other harvest related taxes is only around 3% of current revenues, and total income reduction for the community is less than 1%.

Table 4.3 Summary of Estimated Forest Sector Employment and Revenue Impacts

		Before FPC *(Change from pre-TSR)*	FPC Estimate (Change Before FPC)	Draft MAC Strategy (Change over FPC)	Final MAC Strategy (Change over current AAC)
Near Term - Decade 1	Change in harvest volume	-14,800 m3	-59,200m3	-22,000 m3	-14,000 m3
Revelstoke - Employment (PY) at Risk	Harvesting/silviculture	-(5 - 10)	-35	-15	-(5-10)
	Processing (depends on securing alternative fibre)	--	-up to 20	-10	--
	Total Direct PY at risk	-10	- up to 55	-20*	-10
	Spin-off employment	-5 to -10	-20 to –30	-5-10	-5 to -10
	Total Revelstoke Employment (PY) at Risk	-15 to -20	-70 to -80*	-25-30	-15 to -20
Rest of Province PY at Risk	Malakwa mill	- -	-10	--	--
	Pulp mills and spin-off	-10	-40	-15	-10
Revenue $Millions/year	Revelstoke forest sector and spin-off wages	-$0.8	-$3.3	-$1.2	-$0.8
	Provincial. taxes	-$0.08	-$0.4	-$0.13	-$.08
	Stumpage (1996 average)	-$0.16	-$0.7	-$0.24	-$0.16
Longer Term - Decade 2	Change in Harvest volume	+6,700m3 (relative to Before FPC for decade 2)	-52,500m3 (relative to decade 1 Before FPC scenario)	-19,000 m3 (relative to FPC scenario for Decade 2)	-18,000 (relative to Final Strategy Decade 1)
Revelstoke Employment (PY) at Risk	Harvesting/silviculture	+ - -	-30	-10	-10
	Processing (risk depends securing alternative fibre)	+ - -	-15	-5	-5
	Total Direct PY at Risk	+5	-45	-15	-15
	Spin-off	+ - -	-15 to - 25	-5-10	-5-10
	Total Revelstoke Employment (PY) at Risk	~ +10	-60 to -70	-20-25	-20-25
Rest of Province - (PY) at Risk	Malakwa mill	- -	-10	--	--
	Pulp mills and spin-off	- -	-35	-10	-10
Revenue $ Millions/year	Revelstoke forest sector and spin-off wages	+0.4	-$2.8	-$1.0	-$1.0
	Provincial Taxes	+0.04	-$0.3	-$0.1	-$0.1
	Stumpage	+0.07	-$0.6	-$0.2	-$0.2

- - = less than 5 PY
**** Numbers may not sum due to rounding***
Note:*(2) Changes in employment and revenues for Before FPC decade 2 are from the decade 1 Before FPC harvest level of 467,500m^3 Changes in employment and revenues for FPC estimate in decade 2 are the incremental change, over and above the Before FPC change for decade 2. Similarly, changes in employment and revenues for the draft MAC Strategy in decade 2 are the incremental change, over and above the FPC change for decade 2.*

5. Tourism and Recreation

Revelstoke supports a diverse, year-round tourism industry featuring distinctive summer and winter products. In summer, Revelstoke attracts travellers on the Trans Canada Highway. The area offers a variety of outdoor recreational opportunities and offers a gateway to Revelstoke and Glacier National Parks. In winter, Revelstoke offers a range of backcountry ski opportunities (heli-ski, cat-ski, and touring), snowmobiling, and downhill skiing.

Based on Ministry of Finance and Corporate Relations estimates, the 1991 estimated employment for the Revelstoke tourism industry was 879, representing about 23% of the basic employment within the area. The associated employment income (after tax) was estimated to be about $11.2 million; 10% of the area's total income. Data beyond 1996 are not currently available, however, the continued increase in tourism activity within the area and relative decline of the mining and transportation sectors makes it reasonable to assume that tourism has increased its relative share in the local economy.

5.1 Highway and Community Tourism

Most visitors to Revelstoke arrive via the Trans Canada highway and utilize the facilities and services within the communities and along these routes. This portion of the industry is generally referred to as front country tourism. While the majority of front country facilities and services are privately owned and situated on private land, Crown land plays an important part in the front country tourism experience since it comprises most of the views from communities and highways. Crown land also provides opportunities such as picnic sites, viewpoints and day-use hiking trails that are important to front country tourism.

Tourist accommodation in the Revelstoke are comprises over 900 rooms[7]. Room revenues for the Columbia-Shuswap areas (room revenues are not broken out for Revelstoke area) are estimated at $21.5 million for 1995, representing a 12% increase over 1994 and a 7% average annual increase since 1990. More recent information is not available.

Major tourism features in Revelstoke include:

- Mount Revelstoke and Glacier National Parks - 3.8 million travelling through the park in vehicles (a 4% average annual increase since 1987). Visitors to the Glacier Pass Centre at Glacier National Park was about 125,000 in 1998.

- Revelstoke Dam Visitor Centre (60,000 visitors in 1998; a 20% decrease since 1995)

- Four theme museums; the largest being the Railway Museum and the most unique being the Piano Keep Gallery

The community accommodation businesses also serve visitors who travel into the back country to partake in outdoor and adventure related activities. These visitors may overnight in the communities and take day trips to the backcountry, or stay in front country accommodations at the beginning and end of a backcountry trip.

[7] Revelstoke Economic Development Commission, 1999.

5.2 Outdoor/Adventure Related Tourism/Recreation Activities

Revelstoke supports summer and winter outdoor and adventure related activities. Several tourism businesses in the area provide services and facilities to take visitors to the back country. Visitors can also partake in these winter and summer activities on their own. Although these independent recreationists are not directly using a tourism business to access the back country, they typically generate tourism expenditures before or after visiting the back country. In addition, many local residents partake in these activities. Although they are not included within the definition of tourism, residents use many of the same areas for recreation.

Heli-Skiing/Cat-Skiing

The glaciated mountains and deep snow conditions of the Columbia mountains provide what many regard as some of the best backcountry skiing in the world. Six area-based tenures (five heli-ski and one snowcat-ski tenure) cover most of the Revelstoke Forest District. Half of these operations use accommodations in the City of Revelstoke; the others use self-contained back-country ski chalets.

All ski operations utilize a wide range of terrain. Each uses terrain below tree-line to provide safe and enjoyable skiing during times of poor weather or low snow stability. It is estimated that approximately 70 per cent of heli-ski activity is undertaken in the forested areas[8].

Based on interviews conducted in 1994[9], heli- and cat-ski business in Revelstoke directly employ between 40 and 50 people on a full time equivalent basis. This includes some year-round management and maintenance staff, with the remainder working during peak season (December to May). Employment has likely increased with expanded operations. Direct gross revenues generated by the clients to these businesses is estimated at $10 million. Discretionary spending by heli- and cat-ski clients is unknown, however it is estimated at between $150 and $200 per day[10]. For those clients accommodated in Revelstoke hotels, full seasonal occupancy for the heli-ski businesses would translate to roughly 5,000 visitor days for the winter season.

Heli-ski operators also spend substantial amounts on helicopter leases, supplies and repair. However, much of this flows out of Revelstoke to other communities in the Kootenays and the Okanagan. Heli- and cat-ski businesses also occasionally spend significant sums on building or renovation of lodges.

Snowmobiling

Snowmobiling is another important component of winter tourism in Revelstoke. The area is widely regarded as having some of the best snowmobiling conditions in North America. Revelstoke boasts major trail areas within seven kilometres of downtown Revelstoke, and a season that extends from December to May.

Many of the visitor to Revelstoke for snowmobiling[11] are from Alberta. It is estimated that visitors stay an average stay of 3 days and have an average daily expenditure of between $100 and $150.

[8] Hank Krawczyk, personal communications
[9] Revelstoke TSA Socio-Economic Analysis, February 1994.
[10] Revelstoke TSA Socio-Economic Analysis, February, 1994.
[11] Source: Ron Laroy, Revelstoke Snowmobile Club

Other Winter Related Activities

Revelstoke offers opportunities for backcountry ski touring in addition to the heli- and cat-ski operations. Facilities include three back country lodges (two in the Selkirk Mountains and one in the Monashees), and a motel and several mountain huts in the Rogers Pass area. The City of Revelstoke is often used by ski touring groups as a staging area. Levels of use and levels of expenditure by these groups is unknown.

Revelstoke also supports a downhill ski area, Powder Springs on Mt. Mackenzie, that primarily serves skiers from the immediate area. From December 1998 to March 1999 the ski hill served over 16,000 skiers. The City of Revelstoke now has a Memorandum of Understanding with a resort development company which proposes to initiate planning and approvals for a destination resort.

Summer Outdoor Recreation

Much of the summer outdoor recreation in Revelstoke is associated with parks. This includes the two national parks, three provincially operated campsites, two roadside day use sites, and a lakeside park and forest service sites on highway 23. Monashee Park, 40 km to the south, is inaccessible from highway and offers only backcountry recreation. As well, the BC Forest Service provides 8 campsites, a canoe route and 12 trail systems in the area.

In 1996, visitation to the three provincially operated campsites was approximately 59,000 day visitors and 20,500 campground visitors. Since 1989 the total number of day users has increased by about 1% per year and campground use has increase by about 18% per year.

5.3 Recreation Opportunities

The Revelstoke area supports a variety of motorized and non-motorized recreation activities which occur throughout the year.

Motorized Recreation

Motorized recreation evident in the area includes snowmobiling, four wheel drive and all terrain vehicles. Availability of land base for motorized recreation is in part determined by access to forest and mining roads. This is particularly true for summer motorized recreation. Construction of roads for forestry and mining has the potential to open up new areas for motorized recreation. However, this new access may be balanced by action to deactivate unused roads.

Snowmobiles, the primary form of winter motorized recreation, are less dependant on roads. Access to land base for snowmobiles is largely a function of depth and quality of snow, and the nature of the snowmobile itself. Recent changes in design and technology have given rise to snowmobiles that can negotiate deeper snow and steeper terrain. New snowmobiles and increased use have recently given rise to conflicts between snowmobilers and other backcountry recreation and tourism activities such as heli ski and cat-ski, and backcountry skiing.

Non-Motorized Recreation

Non-motorized recreation in the area includes nature viewing and photography, hiking, riding, biking, cross-country and back country skiing, canoeing, kayaking, rafting, scuba diving, berry picking, beach and water play, picnicking, swimming, fishing and mountaineering. These recreational activities are dependent to some extent, on the availability of and access to attractive landscapes. Increasing

population, an apparent increase in interest in the environment and in the need to seek retreat from urban settings indicate an increasing participation in non-motorized recreation.

5.4 Impact Analysis

The Revelstoke area, with its natural setting and highway linkages, is well suited to attract the growing population of travellers looking for outdoor adventure and wilderness experiences. Although statistics are not available for the growth in outdoor travel within the area, some studies[12] indicate that this sector of the industry is experiencing significant growth. There is a growing demand for summer and winter activities near urban areas, allowing the traveller to stay in the communities and go out on day trips to natural settings for outdoor activities.

Methodology

While the character and success or failure of the tourism industry in the Revelstoke District ultimately depends on a very wide array of influencing factors, many of which are not directly affected by Crown land and resource management, the management of these resources does plays a significant role in determining the extent to which the area can capitalize on the growing demand for tourism. In particular:

- The continued growth of the community and highway tourism in the area depends, in part, on maintaining the settings that are attractive to this growing market. Scenery is the most important feature for many of the front country businesses. The Trans Canada highway, the City of Revelstoke, and the highway 23 corridor south of Revelstoke are the main front country areas. The quality of views in these areas plays an important role in providing appealing settings for front country tourism. Views in the backcountry are also important to outdoor recreationists seeking a natural setting.

- Availability of infrastructure, such as facilities and services for visitors, will also determine the extent to which the industry will grow. Many front country visitors seek outdoor experiences, so ready access to natural settings and facilities such as trails is another important contributor to continued growth in tourism.

- The development of new tourism business also requires a sense of longer term security both in terms of maintaining the setting required for the product being marketed and in terms of being able to continue operations in the area in which investments are made. Within the tourism industry, operators and prospective operators have noted some difficulty in expanding or establishing back country operations on Crown land. Factors contributing to this difficulty include the inability to secure tenure for most backcountry operators.

[12] Ecotourism Market Demand for BC and Alberta, 1995; Adventure Travel in Canada, 1995, Tourism Growth Management Strategy.

Thus the analysis of the impact of the incremental analyses – Before FPC, FPC and draft MAC Strategy - will focus on a qualitative assessment of the following themes and issues:

- Settings: scenery and character of surroundings;
- Tenures: including CBR and allocation of Crown land; and
- Infrastructure: including trails campsites etc.

Impact of Before FPC

Settings

a) Scenic Setting

Under current, pre-FPC management, there is no requirement for tourism values to be taken into account in non-forestry resource development activities (e.g. mining). For forestry activities, Visual Quality Objectives (VQOs) are established. Visual Quality Objectives (VQOs) are the system used by the Ministry of Forests to plan logging in areas that are visually sensitive. VQOs outline the amount of disturbance (non-greened-up logging) that may be evident in a landscape. At this time, VQOs in the Revelstoke Forest District are "recommended" only, and have no legal standing. There is no requirement for management of backcountry visuals, nor to undertake good visual design.

Through time, logging will take place in all operable front-country landscapes, as lands outside of protected areas are available for logging and mineral exploration. Viewscapes along the corridors have already been altered to some extent, and in areas with no recent history of landscape disturbance, logging will occur, and in most cases, will be evident.

b) Recreation Settings

Many people living in urban centres seek opportunities for outdoor recreation in scenic, uncrowded settings. With growing population, the demand for such outdoor recreation is increasing. As well, given Revelstoke's proximity to urban centres in Alberta and the Okanagan, it is an attractive destination for recreationists from these areas as well. With increasing visits comes potential for crowding and conflicts between incompatible types of recreation.

Currently there is a good supply of primitive and semi-primitive non-motorized opportunities within the area through the Provincial and National Parks and other Crown land outside the operable forest13. Under the current regime, the increase in roaded settings in the operable land base will provide motorized recreation opportunities and the supply of primitive and semi-primitive non-roaded opportunities on the operable land base will decrease. The intent of Forest Recreation is to manage this rate of change. Through initiatives such as road closures and alternative forestry methods a range of recreation opportunities can be provided.

Tenure and Access to Crown Land

Commercial tourism operations using Crown land usually require some form of tenure, typically under *the Land Act*, to operate legally. However, commercial tourism tenures do not give tenure holders

[13] Approximately 70% of the land base is inoperable, primarily due to the rugged terrain and steep slopes within the Revelstoke Forest District.

influence over the management of the natural setting, nor do they infer substantial influence over other activities such as logging and mining that may occur on or adjacent tenured areas.

The Commercial Recreation policy was recently established to address the allocation and management of tourism-related tenures. There is considerable interest and potential for growth in commercial tourism in the backcountry, and a corresponding backlog of applications for tenure under this policy.

Infrastructure

The Revelstoke area affords a range of tourism and recreation opportunities. Community organizations and the tourism industry have completed a planning process to develop a tourism strategy to facilitate the development of tourism. This Strategy includes an overall vision for using the area's natural and heritage resources to foster the development of tourism in Revelstoke as a viable economic sector. The key strategies identified that are relevant to land use planning include the development and promotion of winter and summer activities, the development of Revelstoke as a snowmobiling destination and the support of highway revitalization efforts.

Summary Assessment:

While the potential exists for growth in tourism and there is considerable effort in developing this sector, the extent of growth will be limited by lack of control over scenic resources and may be further limited if revised Commercial Recreation policy does not adequately address tenure issues.

Impact of FPC Estimate

Settings

a) Scenic Setting

Through time, logging will take place in all operable front-country landscapes -- landscapes visible from Revelstoke, the Trans Canada corridor and Highway 23 south of Revelstoke. The FPC provides no explicit guidance for management of front country landscapes, and it is assumed that this scenario will not lead to established Visual Quality Objectives. The FPC assumes continuation of the management regime currently in place, that is, visuals management generally consistent with recommended VQOs. With increasing focus on logging in visible areas, and without established VQOs, however, the FPC scenario leads to increased risk to front country landscapes. This risk of declining quality is greatest for the Highway 23 corridor.

The FPC scenario also makes no provision for management of backcountry landscapes. Accordingly, a gradual and significant decline in visual quality of backcountry landscapes is anticipated under this scenario.

b) Recreational Settings

Under the FPC scenario primitive and semi-primitive unroaded areas outside of National Parks and within operable areas which have a wilderness character will be roaded over the long term. The lands will then be converted to roaded resource land recreation opportunities. Both Glacier and Revelstoke National Parks, as well as other Crown land outside the operable forest. will provide the main supply of primitive and semi-primitive areas.

Although in part, the creation of new access routes for forestry has the potential to open up new areas for motorized recreation use, the trend to deactivate newly created roads for management reasons will limit

this access to some extent. Roads which are deactivated will then be changed in their classification from a roaded resource area to semi-primitive motorized.

Tenure and Access to Crown Land

The FPC does not affect tenure or access to Crown land for tourism.

Infrastructure

The FPC does not provide for general resource management direction for the area that will affect infrastructure development.

Summary Assessment

Scenic values may be managed or enhanced under the FPC, however the overall viability of the industry will not be changed over pre-FPC management.

Impact of the draft MAC Strategy

Settings

a) Scenic Setting

The draft MAC Strategy distinguishes between front country and backcountry landscapes, and recommends designation of front country areas as known scenic areas under the FPC.

As with the Before FPC analysis, through time, logging will take place in all operable front-country landscapes. However, drawing from the Kootenay Boundary Land Use Plan Implementation Strategy, the draft Strategy provides guidelines for design of logging and mineral exploration in known scenic areas. Guidelines and scenic areas outline three classes of management, reflecting importance of those landscapes to tourism and recreation.

Under the draft strategy, land visible from Revelstoke and the Trans Canada highway corridor is identified as Class 1, with the following guidelines:

- In most visible foreground areas and in important or prominent midground areas, disturbance may be discernible but should not be evident in the landscape.
- In less important or prominent foreground areas, most midground areas, and important or prominent background areas, visible disturbance should remain subordinate in the landscape.
- In most background areas and less important or prominent midground areas, landscape alterations may be apparent, but should be designed to blend into the landscape in form and colour.

For the purposes of this guideline, *Foreground* refers to landscape up to one kilometre away, *Midground* refers to landscape between one and five kilometres away, and *Background* refers to landscapes between five and twelve kilometres away.

The draft Strategy identifies highway 23 south of Revelstoke as Class 3, with the following guidelines:

- In most foreground areas, disturbance should be subordinate in the landscape.
- In less important or sensitive foreground areas, and in midground and background areas, landscape alterations may be apparent, but should be designed to blend into the landscape in form and colour

The Strategy does not establish VQOs, nor do the scenic area provisions of the plan replace VQOs. However, the plan establishes a regional context for visual management, and supports a consistent approach to visual design. The Strategy also provides the District Manager with incentive and logic for legally establishing VQOs at standards consistent with the Strategy.

The draft Strategy also provides for rehabilitation in areas which have been previously harvested. Over the long term this management regime has the potential to improve upon the visual quality if applied to key use areas and if design requirements are properly implemented.

In summary:

- Current guidelines for visual design are draft only and applied with some inconsistency. This Strategy contributes to consistent standards of visual design for landscapes visible from the City of Revelstoke and the Trans Canada highway corridor
- In recognition of the existing and growing tourism values in the area, the Strategy also brings consistent standards of visual design to landscapes visible from highway 23 south of Revelstoke, compared to the absence of visuals standards for areas viewed from highway 23 north. This will result in levels of landscape disturbance that are somewhat higher than those now evident, and higher than those applied to similar highways elsewhere in the region.

Backcountry Landscapes

For the most part, the Strategy does not define management standards for backcountry landscapes, due to the extensive nature of views in the backcountry. The Strategy does, however, outline two approaches to visual management in backcountry areas. Recreation guidelines include recommendations for visual management of features such as trails, campsites and backcountry lakes. These recommendations address relatively localized areas, trails, etc. - for example recommendations that logging within 200 m of a campsites should be designed such that it maintains visual quality.

Visual quality of areas beyond the immediate vicinity of a recreational feature are guided by a provision of the Strategy stating that good design should be applied everywhere. This means that at a minimum, design of cutblocks anywhere should reflect lines of force analysis or some similar technique to “fit” cutblocks into the landscape. Straight lines of existing cutblocks will continue to exist for some time, but new design should not create additional straight edges.

In summary:

- In general, logging may be more evident in the backcountry. Increased patch size and reduced standards for green-up will lead to substantial visual disturbance in some areas.
- Policies in the draft MAC Strategy calling for good visual design should lead to progressive improvement of cutblock design and integration of cutblocks into the landscape
- Guidelines for management of tourism and recreation features in the backcountry should lead to design in the immediate vicinity of features and in key back country views

Design, certainty and risk in landscape management

As with the other scenarios, in areas with no recent history of landscape disturbance, this means that logging will occur, and in most cases, will be evident.

Many parts of the tourism industry are sensitive to landscape quality. Poor visual design can reduce the overall appeal of a landscape and the desirability of a community as a home, destination or overnight stop. The visual effect of logging and mineral exploration depends in large part on the quality of visual design. Design quality cannot be codified in standards or guidelines. The draft Strategy does makes recommendations regarding design and, in front country areas, extent of visually evident disturbance. However, these recommendations do not fully extend to operational planning, and additional work is required - notably establishment of VQOs - to fully implement the recommendations of the Strategy

b) Recreational Settings

As with the FPC, with continued logging and roading of old-growth areas, much of the land that now offers Primitive and Semi-Primitive Non-Motorized recreational settings will convert to Semi-Primitive Motorized and Roaded Resource Land settings. The Strategy makes some provision for road deactivation specifically for the purposes of maintaining semi-primitive non-motorized settings. Road deactivation for habitat management may also have this result.

Most non-motorized recreation opportunities will be found in the National, Provincial and Regional parks and higher elevation and inoperable areas. The recreation guidelines of the Strategy specifically addresses high value wilderness areas and provides for guidelines to manage the backcountry recreational features including roads, trails, campsites and unroaded lakes.

Tenure and Access to Crown Land

The objectives and strategies established in this Strategy offer general guidance with regard to resource allocation and commercial tourism.

Commercial tourism tenures do not influence natural setting, nor do they infer substantial influence over other activities such as logging and mining that may occur on or adjacent tenured areas. However, this Strategy contains several strategies that attempt to integrate and articulate the needs of commercial tourism relative to other resource uses.

Management for other resources could result in limitations to existing and new tourism tenures. Most notably management of caribou habitat could affect the management and operation of those heli and cat

operations whose areas of use overlap with caribou winter habitat. For these operators specific management and operations guidelines will be established to minimize disturbance of caribou populations. Caribou habitat may also constrain location of new backcountry facilities and businesses.

In summary:

- The Strategy could result in improved consideration of the needs of existing tourism tenure-holders in planning for logging and mineral exploration.

Infrastructure

This Strategy provides guidelines for management of recreation facilities such as trails and campsites, and for design of logging and mineral exploration adjacent those facilities. Provision of new recreational infrastructure is beyond the scope of this Strategy.

Impacts of the Final MAC Strategy

Relative to the draft strategy, the final MAC strategy includes revised biodiversity management and moose management guidelines, as well as expansion of the operable area for timber harvesting, which will increase the area harvested, and permits large, aggregated patches of harvesting in some areas. This may have a negative effect on backcountry tourism experiences. However, requirements for good visual design, and encouragement of the development of design expertise in the area, may offset these impacts somewhat.

The final strategy also refines the application of viewscape management principles in areas viewed from Highway 23S, including a focus on good visual design within the panoramic viewscapes in the area, and emphasis on rehabilitation to mitigate the visual impacts of past logging.

Summary assessment

Overall, the final MAC Strategy has the potential to improve on the current status of the tourism industry. The visual impact of logging and mineral exploration in landscapes, will be determined in large part, by the quality of visual design. This Strategy outlines priorities for landscape management, and establishes a general approach. It does not, however, guarantee the quality of visual landscape design. The Strategy contributes to consistent standards of visual design for landscapes visible from the City of Revelstoke and the Trans Canada highway corridor, and brings consistent standards of visual design to landscapes visible from highway 23 south of Revelstoke.

In general, logging may be more evident in the backcountry due to increased patch size and reduced standards for green-up, relative to the FPC. However, the Strategy's policies and guidelines should lead to improvement of cutblock design and improved design in the immediate vicinity of features and in key back country views.

The Strategy could result in improved consideration of the needs of existing tourism tenure-holders in planning for logging and mineral exploration.

6. Mining

6.1 Profile of the Mining Sector

The area has high mineral potential as evidenced by the favourable geological environment and its long history of mining activity. Until late 1996 the main operating metal mine in the plan area was the Bethlehem Resources Goldstream copper-zinc mine, 90 km north of Revelstoke. The Ministry of Energy and Mines estimates that this mine produced $42 million worth of metals and during peak production employed an average of 150 individuals, 54 of whom were local area residents[14]. Production was halted at this mine in November, 1996. Small amounts of flagstone, soapstone and placer gold are also currently produced. The high mineral potential continues to support exploration activity, most recently in the headwaters of Hoskins and Liberty creeks. Placer mining is active within the area as well.

A measure of mining potential and use is provided by the number of mineral tenures and mineral occurrences in the area. There are a total of 412 mineral tenures of all types (excluding Crown Granted Mineral Claims)[16]. Of these tenures, 342 were for mineral claims covering an estimated 55,487 ha within the area. There are also 70 placer claims covering an area of 3,535 ha[17]. In total there are 136 known or documented mineral occurrences, which include the following:

- 1 producer (flagstone)
- 18 past producers
- 9 developed prospects
- 19 prospects
- 89 showings

Of these occurrences, 60% were metallic mineral deposits, 26% industrial mineral deposits, 7% placer gold deposits and 5% uranium deposits

There are a few producing aggregate quarries near Revelstoke, however, this analysis excludes sand and gravel quarries as specific tenure information was not available.

The Ministry of Energy and Mines has developed mineral potential maps for the area. Of the 16 landscape units within the planning area, 2 were ranked as having very high mineral potential, 6 as high, 6 as moderate and 2 as lower mineral potential (the three parks were not included in this ranking).

6.2 Outlook for the Mining Sector

The medium to long term outlook (5 to 30 years) for metal mining in the area and Kootenay Area in general appears reasonably promising. If the predictions of some analysts are borne out, a global shortage

[14] Of the 54 local residents, some have obtained employment in the mining sector outside of Revelstoke, some have started up their own businesses or obtained employment in Revelstoke and some are still seeking employment.
[15] Of the 54 local residents, some have obtained employment in the mining sector outside of Revelstoke, some have started up their own businesses or obtained employment in Revelstoke and some are still seeking employment.
[16] Tenures as of May 1996. Subject to change without notice.
[17] As mineral and placer claims overlap the two estimates of tenure areas can not be added together to provide total area. Source: Ministry of Energy and Mines.

of base metals may materialize at the beginning of the next century, implying an increase in demand and price for lead, zinc and copper. Silver and gold prices are also expected to rise due to projected declines in world production and increased demand. This would stimulate additional exploration throughout the area and renewed mining activity.

Several metallic mineral deposits in or near the Revelstoke area have the potential to become operating mines, depending on market conditions. These include: J & L / Yellow Jacket (gold, lead and zinc deposits for which about $2.7 million expenditures on exploration and feasibility studies is planned), the Rain, Jordan River, Ruddock Creek, Standfast (Wigwam) and Big Ledge lead-zinc deposits; the Mount Copeland molybdenite deposit and the Groundhog Basin (French Creek) gold deposits. Among industrial minerals there is potential for dimension stone; nepheline syenite (Trident Mountain); placer garnet, kyanite and sillimanite (Stitt, Forty-nine and other creeks); quartzite and zirconium (Monashee Quartzites); as well as lithium, soapstone and dolomite.

The factors which have the greatest influence on the outlook for this sector include:

- developments in world market conditions, metals prices and the value of the Canadian dollar;
- developments in the provincial and international taxation and regulatory climates;
- exploration success; and
- technology.

The implementation of land use strategies also plays a role in the viability of the sector. Key issues for mining include:

- security of tenure;
- security of access; and
- certainty that if an economically viable deposit is discovered, it can be developed if it can satisfactorily mitigate impacts to defined environmental, economic and social values.

At present the National and provincial parks within the area are the only areas that explicitly do not permit mining activity. The remaining Crown land is available for exploration and development. Further reduction in certainty of tenure, access and permitting will have an impact on investor confidence and industry viability within the area.

6.3 Impact Analysis

Impact of FPC Estimate

FPC impacts on mineral exploration and development are difficult to quantify since they involve so many variables and depend significantly on how they are applied. At its most permissive, the FPC should have a negligible effect. At its most restrictive, the FPC can create virtual no-entry zones (e.g., wildlife habitat areas) similar to ecological reserves.

Impacts apply to field practices as well as administrative procedures. Field practices may include, for example, stream crossings, road layout and construction standards, seasonal restrictions for caribou requirements, visual landscape management, and biodiversity requirements. The largest impacts of FPC may be on placer operations which usually occur within riparian management areas or riparian reserve zones.

To offset this, government has released the *Mineral Exploration Code*, an amendment to *Mines Act* regulations, that should relieve explorationists of most if not all, FPC requirements for work on mineral claims. The purpose of the *Mineral Exploration Code* ("MX Code") is to meet all the environmental protection measures of the FPC in a way adapted to the needs of explorationists. It is intended to streamline administrative procedures. The MX Code will not be free of impacts in its own right, but they are expected to be much less than the FPC. (Note: placer regulations are also under review, but are not part of the MX Code).

The FPC still applies to mineral activities off tenures, in particular the construction of access roads. To this end the *Mining Rights Amendment Act* ensures access to mineral tenure. The Ministry of Forests must issue the appropriate permits, taking into consideration any higher level plans that may be in effect.

Administrative impacts of the FPC come through the time required to process applications (e.g. for a licence to cut or approval of a Notice of Work), the need for field inspections, and how the FPC is interpreted by the District Manager or Designated Environmental Official as to its consistency with a higher level plan.

Delays in processing can affect explorationists in various ways: lead time to get approvals, time (and cost) required to lease equipment for longer periods; lost time in the field may lead to interruptions in the continuity of an exploration program and subsequently loss of key personnel; lost opportunities in vending a property due to extra constraints in the ability to develop it. If access plans have to be co-ordinated with other users, more planning time is required and the final route may not be advantageous for mineral exploration.

These impacts are difficult to quantify. However, one internal Ministry of Energy and Mines estimate is that, for an average drilling project in a designated community watershed, an exploration company could face a 10 - 15% increase in operating costs. It can be assumed that all direct costs (due to increased operational requirements or delays) have associated opportunity costs as well.

Impact of the Final MAC Strategy

A qualitative impact analysis of the final MAC Strategy on the mining sector was conducted which incorporated mineral potential and the sensitive resource values identified in the *Resource Management Guidelines, Section 12*: high and intermediate biodiversity emphasis; riparian areas; caribou habitat; critical ungulate winter ranges; Class 1 viewscapes; and domestic or community watersheds. In addition grizzly bear habitat is also considered because of the possibility of severe restrictions on access (road density and use) in bear management areas. The potential impacts of these sensitive resource values on mineral resource development are as follows:

High and Intermediate Biodiversity Emphasis Areas and Riparian Areas
The sensitive value centres on conservation of mature and old growth forests. Areas of concern are valley bottoms. New exploration access will likely be affected by restrictions on harvesting. Longer term deferrals on harvesting (e.g., in Old Growth Management Areas) may result in delays for exploration permits. Placer operations are especially vulnerable to restrictive management in riparian zones.

Caribou Habitat and Critical Ungulate Winter Range

Guidelines associated with access management in caribou habitat and ungulate winter range, including target road densities and seasonal access restrictions, may have an impact on road construction and use, which in turn may complicate or extend the exploration process. *Class 1 Viewscapes*
Class 1 viewscapes with stringent guidelines, and even Class 3 with less stringent guidelines, may place constraints on certain types of mineral operations (e.g. large open pit operations, extensive stripping of steep slopes, large waste-rock piles or tailings impoundments). Impacts due to Class 1 requirements for the Trans Canada Highway could be limited as there are few mineral occurrences which are actively being explored in this area. Also, the type of mining activity is expected to be primarily underground and some mineral occurrences fall within the non-visible areas of the corridor. Finally, it should be noted that impacts of visual management may be offset by strategy 36.6 from *Section 1.2 Resource Management General Direction* which states: "Mineral exploration and mine development may result in visual disturbance that does not conform to the guidelines".

Domestic watersheds and designated community watersheds
These may result in increased exploration costs and consequential decreased attractiveness for investment. This is offset by two of the community watersheds occurring in Revelstoke National Park which precludes them from exploration. Domestic watersheds are not a major feature of the Revelstoke area.

Grizzly Bear Management Areas
In addition to the sensitive values listed in Section 12, grizzly bear management needs also to be considered since future access management planning will likely result in fewer roads or more access control measures such as gates. This will reduce the quantity and quality of roaded access in these areas.

Guidelines associated with access management in grizzly bear habitat, including target road densities and seasonal access restrictions, may have an impact on road construction and use, which in turn may complicate or extend the exploration process.

Table 6.1 indicates the degree of overlap between the above resource values and the assessed mineral potential for each landscape unit. A rating scale was developed which represents the degree of overlap between these values and the estimated mineral potential:

- 0 = negligible overlap <1%
- 1 = little overlap 1-15%
- 2 = moderate overlap 16 - 50%
- 3 = extensive overlap >50%
- n/a = not applicable (i.e., resource value does not occur in the landscape unit)

The draft strategy assumes that access for exploration and development will not be restricted (according to the government's March 1995 Kootenay Boundary Land Use Plan decision and the *Mining Rights Amendment Act*). However there is a greater potential for mineral impacts in terms of cost or ease of

access from restrictive management in areas where there is a high degree of overlap with other resource values (2 or 3). Of the 8 polygons which have higher mineral potential, the majority (5) have a high level of overlap with one or more of the resource values which could result in a restrictive management regime for mining. The degree to which the restrictive management will apply depends on the relative location of the mineral potential to the resource value within any given polygon. Overall this restrictive management should not exclude mining activities however the potential increase in cost and timing for approval to access the mineral resources could affect the overall viability of a project and decrease investor confidence in the area.

Table 6.1 Landscape Unit Resource Analysis: Overlaps Between Mineral Potential and Sensitive Values

Landscape Unit	Mineral Potential	Sensitive Resource Values and Degree of Overlap						
		Biodi-versity	Defined Ripar-ian Areas	Caribou Habitat	Ungulate Wiinter Range	Grizzly Bear	CWS or DWS	Class 1 View-scape
R1	M-H	1	n/a	1	1	n/a	n/a	n/a
R2	M	1	n/a	2	1	n/a	n/a	n/a
R3	H	1	2	0	1	3	1	2
R4	M	1	n/a	2	1	n/a	1	1
R7	H	0	n/a	1	1	n/a	n/a	1
R8	M	1	n/a	3	1	n/a	n/a	1
R10	H-VH	1	n/a	2	1	3	n/a	n/a
R11	H	1	n/a	1	1	n/a	n/a	n/a
R12	H	2	2	2	1	3	n/a	n/a
R14	M	3	n/a	2	1	3	n/a	n/a
R15	M	1	n/a	1	1	3	n/a	n/a
R16	L	1	n/a	1	1	n/a	n/a	n/a
R17	M	1	n/a	2	1	n/a	n/a	n/a
R18	L	1	2	2	1	3	n/a	n/a
R19	H-VH	1(-2)	2	2	1	3	n/a	n/a
R20	M-H	1	n/a	1	1	3	1	2

DEGREE OF OVERLAP between sensitive resource value and mineral potential: 0 = negligible (<1%); 1 = little overlap (1% - 15%); 2 = moderate overlap (16-50%) and 3 = extensive overlap (>50%); n/a = not applicable (the resource value does not occur in the landscape unit).

ABBREVIATIONS: Mineral potential: L = lower; M = moderate; H = higher; VH = very high. CWS = Community Watershed. DWS = Domestic Watershed.

7. Overall Impact on the Community

7.1 Introduction

When employment in one sector changes (a direct impact), there is a corresponding change in income levels and hence spending in the community. This translates into a change in the employment and income flow through other local businesses (the 'spin-off impacts'). These impacts have been estimated and reported in the forestry section.

Changes in employment and income levels will have a significant effect on the individuals involved – either positive in terms of new employment opportunities, or negative in terms of reduction in work and income levels. Employment or income losses for individuals puts significant stress on them and their families as they search for new employment and possibly adjust to a reduced income, and even consider relocation. Offsetting this are government and community support and adjustment programs that can help individuals and families through these situations (e.g. existing social support programs, initiatives such as the Forest Renewal BC and skills training, etc.). However, while in the long run, change can often turn out to be a positive experience for some individuals, for most, at least in the short term, there is considerable uncertainty and associated anxiety with the fear of and actual loss of employment or income.

Although the impact of even one job loss on the individual affected is significant to that individual, his or her family and friends, the implications for the stability of the community depends on the size of the change in employment and income levels relative to current levels and the growth rate of the economy, as well as the availability of mitigating programs such as Forest Renewal BC, economic development programs, local transition strategies, etc. These mitigating programs will reduce the size of the net direct employment impact in the community and hence reduce spin-off impacts. The extent of the offset depends on how many affected workers find alternative employment and income, and the extent to which the new opportunities provide incomes at the same level as previous employment.

As well, if these direct and spin-off employment or income impacts are small relative to the total employment and income flows within the community, it is unlikely that there would be a widespread or prolonged downturn in the local economy - although specific business that primarily serve the affected sector may see a significant change. If these changes are smaller than the existing growth of the local economy due to increased activity in other sectors or population growth, the impacts would manifest as reduced growth rather than an actual downturn in business activity. Conversely, if the impacts are large relative to current levels or are much higher than the growth of the economy, or compound current economic decline, the impacts would be more widely felt throughout the community.

7.2 Before FPC

Revelstoke has a relatively diversified economy, which enhances the ability of the community to withstand and adapt to changes and fluctuation in individual sectors of the economy. The community currently is facing such changes in some of its key sectors, with the closure of the Goldstream Mine, the restructuring of CP Rail operations and the reductions in timber supply due to the first timber supply reviews.

The impact of the TSR 1 decisions have not been fully absorbed in the community (see forestry section), however, one would expect that eventually, the impacts of the reduction would be felt in the harvesting sector, either through employment or income reduction. If direct impacts are consistent with current employment to harvest ratios, this could mean an incremental impact of less than 1% of the area's employment at risk in the first decade. The impact on the local mills will depend on their ability to continue to secure alternative timber supplies. However, using estimates for milling and harvesting based on employment coefficients, and including estimated spin-off impacts, the total Revelstoke employment at risk amounts to around 2% of total employment. Income at risk is $3.3 million - or 3% of total income, reflecting the relatively high wages in the forest sector. The establishment of Selkirk Specialty Wood would largely offset these forecast reductions. In the second decade, total employment at risk increases by 40 - 70 PY, and $2.8 million in income, however the longer time horizon for this impact gives the community more time to develop strategies to mitigate this impact.

In the past, the Revelstoke community has demonstrated a substantial ability to work together in a positive and productive manner to adapt to changes in the economy. Over the longer term, it is anticipated that the community will adapt to these changes as well. Given the diversity of the local economy, the existence of mitigation programs, value added opportunities in the forest sector, opportunities for timber harvest beyond current operability lines and an almost 4% growth rate in population, it is likely that much of this impact will be absorbed within the growth of the economy and will manifest itself as a reduced growth rate rather than any dramatic change in business activity. However, under this management regime, tourism and recreation opportunities would likely be limited, which may limit opportunities for offsetting activity.

7.3 FPC Estimate

In terms of increased risk to existing employment, the net impact of the FPC over and above the impacts of the Before FPC analysis is relatively small, with the corresponding *incremental* total change in employment at only around 15 to 20 PY, or around 0.5% of total Revelstoke employment and 1% of total income. In the second decade there is a slight increase in direct and spin-off employment levels relative to what would have occurred in that time period under the Before FPC analysis. This small incremental change on its own could likely be offset by Forest Renewal BC programs, potential for further new value-added initiatives in the area, and potential opportunities outside current operability lines. However, the cumulative effects of this combined with the Before FPC analysis would increase the FPC Estimate as discussed by about 25%, but existing programs and new opportunities would still go a long way towards offsetting impacts.

7.4 Draft MAC Strategy

The dominant near term community and social impact largely revolve around the forestry income and employment impacts of the draft MAC Strategy. As noted in the forestry section, an incremental 25 - 30 PY of total Revelstoke employment (including direct and spin off employment) and $1.2 million in income are at risk over the next decade. This amounts to just under 1% of the 1991 estimated total employment and 1% of total income. In the second decade, total person-years of employment at risk is an incremental 20 - 25, and about $1 million in income over what it would be in decade 2 under the Before FPC analysis. These incremental impacts on their own are relatively small.

However, this impact is incremental to those discussed for the FPC and Before FPC forecasts above. Total cumulative total employment at risk is 115 - 135 PY in the first decade, and $5.7 million in local incomes. This amounts to around 3% of total employment in the Revelstoke area, or 5% of total income.

With no mitigating or compensating influences, together, these impacts could result in a noticeable reduction in the vitality of the local economy. However, as noted above, the existing population and economic growth, opportunities for value added initiatives and operations outside current operability areas, and mitigation programs, will reduce the impact of these changes on the community. Implementation of effective support measures at the community level and an effective transition strategy will also be important to address these impacts. As well, it is important to note that the draft MAC Strategy also provides for increased opportunities for employment and business development in the tourism sector, and other sectors that value the increased certainty over land use as a result of a land use plan. These could also help mitigate the cumulative employment impacts. Overall, assuming that no threshold effect occurs in local mills, it is expected that the impacts will be felt as a reduced level of growth or a slight reduction in business activity.

7.5 Cumulative Impacts of the Final MAC Strategy

In terms of estimated timber supply reductions and increased risk to existing employment, the net impact of the final MAC strategy is consistent with implementation of the Forest Practices Code alone. This has been achieved even though the final MAC strategy includes additional management practices for other resource values, including mountain caribou, as well as implementation of the Forest Practices Code. The estimated total change in employment is 15 to 20 PY, or approximately 0.5% of total Revelstoke employment, and 1% of total income. In the second decade there is a slight increase in direct and spin-off employment levels relative to what would have occurred in that time period without he recommended land use plan.

It is expected that the community can absorb this relatively small magnitude of change given the developments in value-added wood manufacturing and growth in the tourism sector. Finally, the long term effect of a comprehensive land use plan which enhances the contribution to quality of life that comes from the quality of the environment should not be overlooked. The plan contributes to the maintenance and health of the natural environment and wildlife populations, which is also valued by many in the community.

Chapter D Moving Forward

Section 1. Implementation and Monitoring

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D. 1.1 Background

Land use planning in the Revelstoke area has, and will in the future, need to be a long-term, community-based process. Figure 1 illustrates the past and expected land use planning processes and new information that will influence land use in the Revelstoke area. While the MAC believes further examination of alternatives at this time is unlikely to reveal a better strategy than these recommendations, the Committee recognizes that improvements in the data or changes in the conditions for a particular resource value would likely change the community's land use recommendations. The community is committed to continued participation in land use planning to ensure there is local, ongoing monitoring of resource conditions and rapid response to changes in conditions.

The *Kootenay-Boundary Land Use Plan Implementation Strategy* outlines a number of steps to implement the strategy (see Appendix 1). The Advisory Committee generally supports the approaches outlined. The following recommendations are made regarding implementation of the Advisory Committee's recommendations in the Revelstoke area.

D. 1.2 Implementation

D. 1.2.1 Declaration as a higher level plan

The Advisory Committee understands the government will declare particular portions of these recommendations, or a compilation of the recommendations, as a higher level plan under the *Forest Practices Code Act of British Columbia*. The resulting higher level plan will provide direction to statutory decision-makers in government resource agencies regarding land management in the area.

The Advisory Committee recommends that the government proceed with declaration of the biodiversity and caribou management objectives contained in these recommendations, as well as provisions for revisions to these objectives, as soon as possible to encourage prompt implementation of this strategy. In the interim, the Committee recommends that government encourage decision-makers to consider the Committee's recommendations when making decisions related to land use.

D.1.2.2 Landscape unit planning

Landscape unit plans are required by the *Forest Practices Code Act of British Columbia* to define resource management objectives and strategies for specific areas of land. The Committee's recommendations include objectives and strategies for each landscape unit based on the general resource management objectives and guidelines. Substantial deviation from these recommendations should only be accepted after broad public consultation, beyond that normally required for landscape unit planning, or where new information warrants changes. Deviations should be reported to the public, and justified, in the annual review of land use plan implementation described below. It is expected that a schedule for finalization of landscape unit boundaries and objectives will be prepared within one year after the plan has been approved by government.

D. 1.2.3 Community input to upcoming timber supply reviews

Special advice from the community may be needed in the upcoming timber supply reviews. These reviews produce information for the Chief Forester of the province to consider when he decides the allowable annual cuts (AACs) for each management unit. Given the continuing questions about the accuracy of some of the timber supply modelling, it is possible that the Chief Forester will have different timber supply forecasts upon which to base his AAC decisions than the MAC considered to reach their recommendations. If this happens, the MAC recommends the provincial government provide resources to the community for prompt and thorough public input processes during the timber supply reviews, particularly for the two northern tree farm licenses, to provide the government with input on the social, economic and environmental factors the Chief Forester should consider in his decisions.

D. 1.3 Monitoring

The regional Implementation Strategy provides for the regional Inter-Agency Management Committee to hold two annual public meetings to review an annual report on the implementation of the strategy. The Advisory Committee supports this approach and recommends that, given the effort the community of Revelstoke has contributed to this process, an annual public meeting be organized in Revelstoke in addition to the two regional locations. These meetings should be scheduled in conjunction with the annual forest development plan public reviews to provide a focus for land use planning in the area. The Committee recommends the annual monitoring report be readable and understandable to the general public.

It is recommended that local government agencies (Ministry of Forests and Ministry of Environment, Lands and Parks) and other organizations involved in land use in the area present the following information at this meeting:

- Update on the implementation of the resource management objectives, strategies and guidelines
- Progress reports and plans for the following year for items listed above under Implementation, as well as the economic initiatives and resource management projects listed in sections 3.2 and 3.3 of these recommendations
- Results of monitoring activities

Individuals and organizations with interests or concerns should be provided opportunities to make presentations and provide comments during the meeting. At the first meeting, government agencies should propose monitoring indicators for public consideration and input. These indicators can be modified over time.

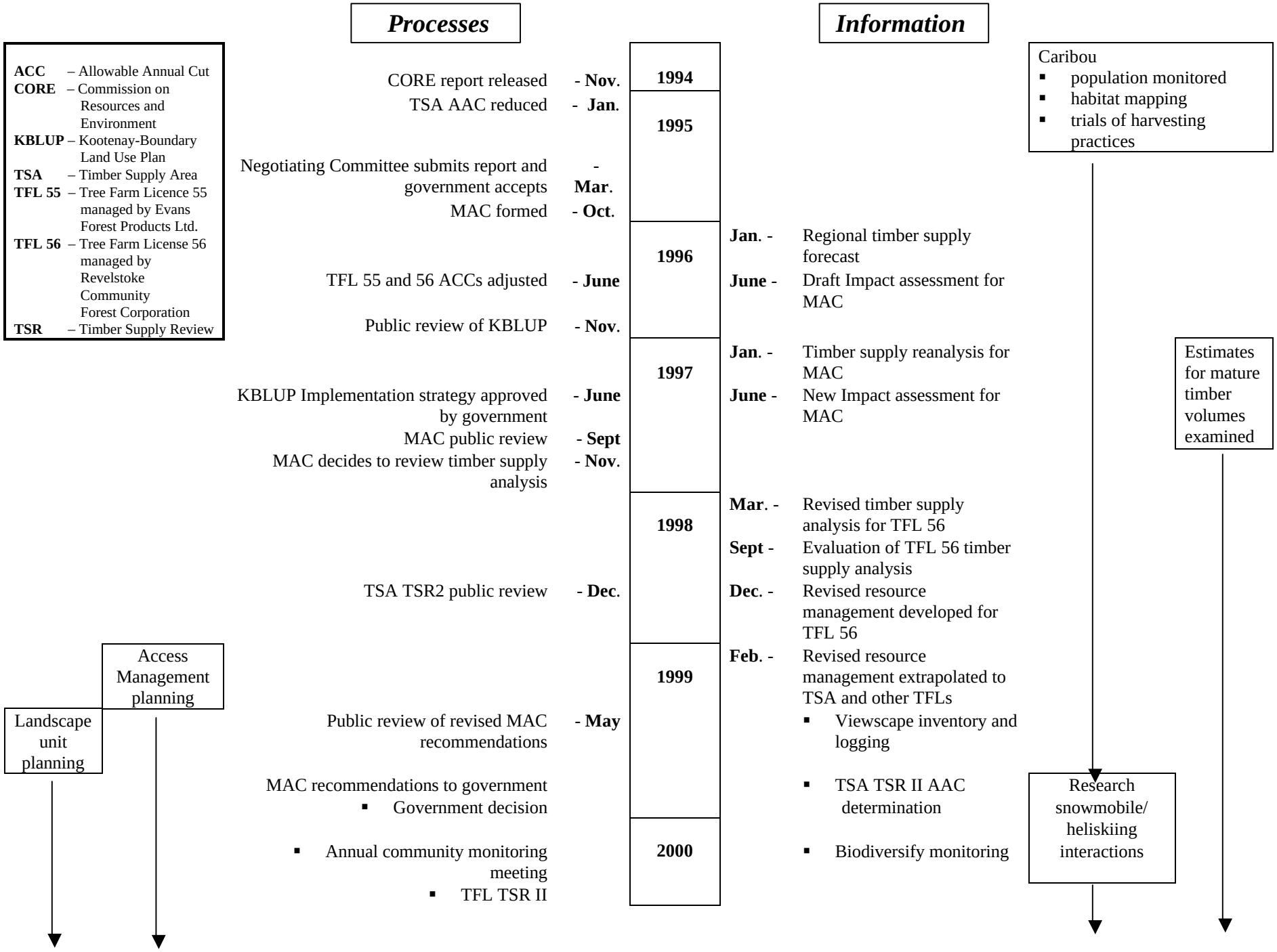
In addition, Advisory Committee recommends the City and the Directors for Columbia Shuswap Regional Districts B and E appoint a Land-Use Planning Monitoring Committee to participate in this annual meeting and, if appropriate, provide recommendations on the implementation of this strategy. If necessary, in addition to the annual meeting, the government could call upon this Committee to provide recommendations regarding new information and options as these are identified, as is anticipated for Monitoring Committees for Land and Resource Management Plans. It is recommended that this Committee be composed of individuals with the same characteristics as the Advisory Committee members:

- Have a respected history of community service
- Understand land use planning
- Can collectively provide a well-balanced perspective to land use in the Revelstoke sub-region
- Can communicate effectively with the public

Information on changes in the plan that are under consideration, or implemented, between the annual public reviews should be widely distributed to 'key communicators' from a range of organizations, sectors and stakeholders in the community, in addition to the Monitoring Committee.

It is recommended that the provincial government be prepared to provide resources as needed to facilitate the monitoring process and address new land use issues.

Figure 1. Past and future land use-planning activities in the Revelstoke area



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Chapter D

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D. 2.1 Background

This section of the recommendations was developed when the Committee was considering recommending 10-15% reductions in timber supply. Refinements to the timber supply forecasts has resulted in an expected 3% reduction in supply over the next decade, substantially reducing the economic consequences to the community. However, these forecasts have a high level of uncertainty associated with them, making it necessary to continue to pursue economic development opportunities to strengthen the economy to weather any unpredicted changes in the timber sector.

D. 2.2 Objectives

The overall objectives of the recommended initiatives are to:

- strengthen the forest sector to withstand the employment at risk due to the projected reductions in timber supply (estimated at 10 person-years), as well as the changes in the types of timber harvested and implementation of new harvesting practices
- ease harvesting costs, including logging costs and stumpage, of local timber companies so they are provincially comparable and competitive
- diversify and stabilize the community economic base
- support existing small businesses and encourage development of new small businesses

D. 2.3 Projects

The Economic Team reviewed the Community Economic Development Strategy, the Tourism Development Strategy and other sources to identify potential economic mitigation initiatives for the land-use planning process. The selection of appropriate projects is a dynamic process and should be revisited frequently to incorporate recent changes in conditions.

The following are the most important economic initiatives at this time. Detailed assessment of these projects is available.

A. Forest Sector

i) Logging and primary processing

a) Harvesting cost reduction

Since 1992, harvesting costs have increased approximately 75% for the forest industry in the province. These increases are compounded in the wet belt area, which includes Revelstoke, because of steep slopes, unstable terrain and high precipitation levels. Currently, harvesting costs for local operators are approximately 10 per cent higher than the average southern interior operation. One of the primary sources of timber to maintain harvest levels will come from previously inoperable areas which have lower than average timber values, and often high logging costs due to difficult road access or terrain.

In addition, existing provincial stumpage appraisal procedures are not considered to be equitable for operators in the Columbia wet belt. While there has been greater fairness built into the stumpage system recently, there continues to be a need to go further. In particular, the system still does not adequately account for the 25-40% of the harvested timber that is pulpwood which must be harvested and transported to market at a loss.

Equitable harvesting costs will ensure the local forest industry remains competitive, will improve financial margins and protect existing forest industry jobs.

Actions: When the Forest Service reviews harvesting proposals, consideration should continue to be given to meeting resource management objectives as well as minimizing harvesting costs.

Provincial stumpage appraisal procedures should be adjusted to adequately account for operating costs in the area. Possible adjustments are:

- matching allowances to actual costs
- district-based allowances and trend factors
- timely updating and implementation of allowances
- roads, road maintenance, silviculture and overhead costs amortized against sawlog volume only
- appraise larger units including currently positive and indicated negative stumpage areas (blending)
- appraise the pulp component to the nearest pulp mill rather than the nearest sawmill to account for transportation costs
- road right-of-way wood should be appraised at the average indicated stumpage rate rather than the upset stumpage rate

b) Allowable annual cut reapportionment

Following the next timber supply reviews for each of the management units if the allowable annual cut is reduced by the Chief Forester, the Minister of Forests should apportion any reduction to the Small Business Forest Enterprise Program.

As tenured timber is usually harvested at a lower cost than the cost of purchasing timber on the open market, the amount of timber the local forest licensees have under tenure is critical to their ability to continue to operate through the changes resulting from the implementation of the land use plan. Unlike many companies operating outside this area, existing local forest companies are actively pursuing innovations and investments to increase the level of value-added processing and employment security in the timber sector which justifies continued allocation of Crown timber to these companies.

Currently a larger portion of the allowable annual cut from the Revelstoke area is allocated to the Small Business Forest Enterprise Program than is common provincially – 22% versus a provincial average of 13%.

The current legal constraint which does not permit reductions to the allowable annual cuts from Tree Farm Licenses for the Small Business Program will need amendment to implement this approach.

Actions: When the allowable annual cut is revised for any of the management units, the Minister of Forests should reapportion the allowable annual cut so any reduction is born by the Small Business Forest Enterprise Program.

At a minimum, any reduction in allowable annual cut should be apportioned based on the portion of the total cut previously held by a licensee. This should also apply to the Small Business Program within Tree Farm Licenses.

c) Innovative harvesting training

Timber harvesting practices are constantly changing to better protect the natural environment and the many non-timber resource values in the Revelstoke area. Ongoing training is required to develop the knowledge and skills of local forest workers to implement these new practices.

In 1997 the Community Skills Centre has completed a training needs assessment for the local logging sector which indicates the priority training areas. The Skills Centre has also organized several effective training programs on a range of environmental harvesting topics such as the Forest Practices Code, cable logging and road deactivation. Assistance will also be provided as new harvesting practices are developed for mountain caribou habitats and visually sensitive areas. The training needs assessment is currently being updated.

Actions: Community Skills Centre to maintain communication with local timber company representatives, consultants and Forest Service personnel to identify new practices requiring training.

Continued funding for training programs.

d) Integrated forest worker development

The objective of these initiatives is to provide training programs and business development support to establish a versatile forest worker labour force with year-round employment. This will ensure a maximum amount of forestry work is done by Revelstoke residents, resulting in more stable employment in the logging industry and improved community stability.

A study carried out in 1997 indicated that approximately $3.2 million of forest management work such as spacing, brushing, pruning, surveys and logging layout is undertaken by contractors from outside the community. Training local, under-employed forest workers to do this work provides real opportunities to improve the employability of local workers and enhance community stability.

The Community Skills Centre organized this type of training program during 1996 through 1998 which has proven unemployed loggers have the aptitude, abilities and desire to carry out forest management work. Several trainees are now employed in silviculture work for local companies, and one of the logging contractors is now under contract to complete silviculture work in the area.

Actions: Continued funding for training programs as needed.

Cooperation of local licensees, companies and the Forest Service in the training program and to provide local employment.

Direct award of forest management contracts to a forest worker group or local contractors.

e) Forest worker development

For the past 18 months, Forest Renewal BC has provided funding to a group of local forest workers and forest industry representatives who have directed forestry training, communication and employment development initiatives organized by the Revelstoke Community Skills Centre. Training programs have included safety, computer literacy and development of specific skills. The group produces a regular newsletter to inform forest workers and the community of issues and initiatives in the local forest industry and assists the industry to address worker employment issues.

Actions: Continued funding for forest worker development in the community.

f) Forest worker transition support

Implications of the projected reduction in timber supply will largely be felt by individual workers and their families. Forest Renewal BC implemented its Forest Worker Transition Program in the community in 1997.This program provides funding to the Community Skills Centre for career assessment and counseling to assist families to develop feasible transition plans, to support workers who wish to retrain for other work, and assist those who chose to relocate to find work. These services are provided at the Community Career Centre and have been valuable to those who have been able to access this program.

Thorough assessment of the opportunity to schedule timber supply reductions to coincide with retirement within the existing harvesting workforce is also needed.

Actions: Forest Renewal BC to continue to fund the Forest Worker Transition Program through a regional or provincial initiative.

Provincial government funding, possibly through Forest Renewal BC be provided to examine the possibility of linking timber supply reductions with forest worker retirement in the local industry.

ii) Value-added wood manufacturing

a) Local access to timber

The issue is to ensure the wood supply from the Revelstoke portion of the Columbia Forest District is available to both primary processors and value-added operators in the local area. There is a strong linkage between the threshold production level of primary processors and the accessibility of “at cost or tenured wood”. Primaries require additional tenured wood to replace timber supply reductions while value-added operators need wood as a basis for their businesses.

Under the Jobs and Timber Accord, the Small Business Forest Enterprise Program allowable annual cut harvested from Tree Farm License lands is to be made available through bid proposals, not competitive sales (Category 1 or 2). In bid proposal sales, proposals are assessed and awarded based on predetermined criteria whereas competitive sales are awarded solely on the financial bonus bid proposed.

Approximately 60,825 cubic metres of timber (TFL 23 -37,700, TFL 55 - 11,675, TFL 56 - 11,480) will be available from the Revelstoke area annually under this policy. Currently 30,000 cubic metres of this timber has been awarded for five years through a bid proposal sale to Selkirk Specialty Woods Ltd. in Revelstoke.

Actions: Consistent with the Jobs and Timber Accord, the Ministry of Forests should, as soon as possible, establish bid proposal sales with the following characteristics:

- three sales of approximately 10,000 cubic metres of timber per year (amount will be less due to roads, etc.) for a 7 year term, which is understood to be long enough for the successful bidder to use the tenure as collateral to access capital
- forest management would be the responsibility of the successful bidder as much as is practical
- proposals including a mechanism to provide logs for trade to operators manufacturing very high value products from a small volume of timber (up to 1,000 cubic metres) will be favoured
- recommended criteria and relative priority of each criteria are:
  a) maintain local, long-term employment in forest management, timber harvesting, primary processing and value-added manufacturing
  b) creation of new employment in forest management, timber harvesting and value-added manufacturing
  c) maximum local value-added product values
  d) existing capital investment
  e) ability to carry out forest management
  f) adequate disposal of residual wood waste (5% of points)
- these sales should be awarded in such a way that their terms are staggered, with new sales available at regular intervals
- these sales should be sold in a manner that ensures the Ministry of Forests District recovers the full cost of administering the program.

Local primary processors should make commitments to cooperate to improve the extent of secondary and tertiary processing of timber in the local area, possibly through some condition of the forest licences.

When the term of the existing 30,000 cubic metre per year bid proposal sale is over, in 2002, the Minister of Forests should seek advice from the community regarding the disposition of this timber.

b) Financing

One of the primary barriers to increased value-adding manufacturing is the availability of financing for small operators. The Revelstoke Community Futures Development Corporation has contracted with Forest Renewal BC to provide increased loan capacity totaling $500,000 ($250,000 each from Forest Renewal and Community Futures) for forest sector businesses ($75,000 maximum) including value-added manufacturing. The Revelstoke Credit Union will also be offering a loan program supported by Forest Renewal BC ($250,000 maximum). These programs will improve the financing situation for smaller businesses but do not address the larger credit needs of the sector to finance major equipment purchases or projects

Actions: Implement and advertise loan programs as they are available. Encourage or establish loan programs for major value-added manufacturing investment.

c) High value timber product opportunities

Very old trees contain unique, high value wood because of the lack of knots and very straight, even grain. The forests in the Revelstoke area are predominantly very old and, where there has not been substantial decay, they produce high value timber.

Currently a small portion of this very high value wood is used to produce high value products locally, such as song boards. Given the unique characteristics of this wood, and its potential to produce high value products, opportunities to develop local industries based on this resource should be investigated.

Also, consideration should be given to how a continued supply of high value, older timber might be maintained over time.

Actions: A feasibility study should be funded to examine opportunities for further local manufacturing of high value products suited to the available sawn timber, and opportunities to maintain some high value timber in the harvest profile over time.

d) Wood waste processing

Local timber companies currently burn or garbage their wood waste which increases their operating costs. Opportunities to convert this waste into saleable products would reduce these operating costs and eliminate the environmental implications of current waste disposal practices.

Downie Timber, the City of Revelstoke and Natural Resources Canada have agreed to jointly provide funding and support for the preparation of a Wood Waste/District Heating Feasibility Study. This study has been initiated with a preliminary analysis in 1997, a Wood Waste Incineration Gassifier Technical Study at Downie Timber in 1998, and a recently initiated Energy Demand Market Study. It s anticipated that the current phase of feasibility work will be completed by December 1999.

Actions: Assistance to participants to implement feasibility studies and project planning.

e) Industrial park

The concept is to develop a value-added wood processing industrial park which would provide serviced sites and the opportunity for cooperative and collective uses of equipment, facilities and services.

Actions: Location, site service, research and feasibility analysis required. Provincial government support to access Crown land opportunities.

B. Small business development

1. Career Centre

In response to a reduction in the level of employment assistance services and programs in the community, the Revelstoke Community Skills Centre has been operating a Community Career Centre in Revelstoke since September 1996. This Centre provides a number of valuable services to unemployed and under-employed workers which had not been widely available in the community. These services include career and educational counseling, labour market information, resume preparation, aptitude testing and local job listings.

The seasonal nature of many of the key employment sectors in Revelstoke's economy – particularly logging and tourism – leaves many workers underemployed and without a stable income. The Career Centre provides support to these individuals to develop alternative employment options including part-time self-employment.

Actions: Commitment from the federal and provincial governments to provide continuing support for this one-stop Community Career Centre.

Forest Renewal BC to continue to provide the Forest Worker Transition Program through this facility.

2. Airport upgrading

Improved air access to Revelstoke would benefit the entire economy, but particularly the small business, self-employment and tourism sectors. A feasible airport is a critical element for the potential development of Mt. Mackenzie.

A recent technical study indicates new navigational technology will permit acceptable access to the existing airport, even in poor weather conditions. Regional carriers have indicated a willingness to provide services if the navigational issues are addressed.

In addition, the runway needs to be repaved, widened to 100 ft. and lengthened to 5,000 ft.

Actions: Estimated cost to install ground based navigational aids is $400,000 and runway way improvements are $329,000. Financial aid could be made available through the Air Transport Assistance Program of the provincial government.

3. Community loan fund / financing

The Community Futures Development Corporation currently operates a revolving community loan fund with a capital base of $3.2 million. Over the past eight years this loan

fund has loaned approximately $1.25 million to forest sector businesses. It has an objective of increasing the asset base to $4 million over the next eight years in order to ensure the Corporation becomes self-sustaining. There is a risk that the federal Western Economic Diversification Program would discontinue support for these community-based organizations before the fund reaches a sustainable level.

The Forest Renewal BC loan fund described under value-added wood processing is also available to other forest sector-based companies.

Actions: Possible contributors to the asset base of this loan fund would be Forest Renewal BC, Columbia Basin Trust, Revelstoke Community Forest Corporation, the Revelstoke Credit Union or through the provincial government as a community bond pilot project.

4. Telecommunications

Improved access to telecommunications technology in Revelstoke for business and industry will increase business opportunities, provide savings for local businesses and make Revelstoke attractive to new businesses.

Actions: Local group to maintain contact with telecommunication providers to identify appropriate technology and funding opportunities.

Provincial and federal governments recognize Revelstoke as a prime location for community pilots of telecommunications options to overcome existing telecommunications capacity and costs. The provincial government should ensure Revelstoke is one of the first rural sites to benefit from the development of the Provincial Learning Network.

C. Tourism sector

1. Tourism marketing

A Tourism Development Strategy for Revelstoke has recently been completed and adopted by City Council. The Chamber of Commerce has been designated as the agency to implement the Strategy and it has hired Tourism Development Coordinator. Approximately $40,000 is required annually to continue this initiative.

Implementation of the strategy will diversify and stabilize Revelstoke's economy. A major component of the strategy recommendations are improved marketing including:

- improved penetration of pass-by traffic market
- package and promote winter activity options
- package and promote summer activity options
- snowmobiling marketing
- highway revitalization
- festivals and events
- continue to market Revelstoke as the "Gateway to Mountain Adventure and National Parks" in publications and help make the theme recognizable

Actions: Provincial funding is required to match existing community and regional funding for this initiative.

2. Commercial recreation tenure administration

The Revelstoke Community Futures Development Corporation together with support of the Chamber of Commerce, Economic Development Commission, Community Skills Centre and Ministry of Forests are proposing to initiate a Commercial Recreation Opportunity Study for the Revelstoke area and will be seeking funding to hire an independent consultant to complete part of the inventory and opportunity analysis work.

Actions: BC Assets and Lands Corporation funding to complete the backcountry tourism business opportunity inventory.

Provincial government to ensure resources and staffing is adequate in BC Assets and Lands Corporation to expedite commercial recreation tenure applications that are currently on file for this area.

3. Mount Mackenzie

The City of Revelstoke and Revelstoke Resorts Ltd. have entered into a Memorandum of Understanding with respect to the planning and approvals for a destination four seasons resort centered on the development of Mount Mackenzie. The Memorandum of Understanding provides for planning, obtaining approvals and the consolidation of base lands over a five year period. It is estimated that the planning and approval process may cost up to 1.5 million. It is anticipated that the planning process will begin in the summer of 1999.

Actions: Assistance from the province to expedite processing of applications with respect to planning approvals and acquisition of Crown land tenures.

4. Community enhancement

The City of Revelstoke has appointed an Enhancement Committee which has been working with private consultants to prepare a Community Enhancement Plan to complement the earlier downtown revitalization project. Plans have been prepared and some elements have been implemented. The City has been seeking financial support from the federal and provincial governments to assist with funding the capital portions of projects planned.

Actions: Project applications placed high on the priority list for provincial funding.

Municipal and business funding and local volunteer effort to be organized.

5. Outdoor recreation infrastructure upgrades

The mountains and alpine meadows in the Revelstoke area create extensive opportunities for hiking and backpacking. Several existing trails require upgrading, while additional trails could be built to link existing trails and access new areas. Cabins and other infrastructure are needed in some locations. This infrastructure will attract more tourists to stop and visit the area.

Construction and maintenance of a more extensive recreation infrastructure require skills similar to the logging industry and would provide employment and business opportunities for under- or unemployed loggers in the community.

Also, in many areas of the province, guidebooks have been compiled which provide maps and descriptions of the recreation infrastructure including trails, campsites, etc.. These guidebooks increase the use of these facilities by visitors, and thus contribute to the local economy.

Actions: Develop strategies for trail and site maintenance.

Secure funding for specific projects and to produce a guidebook of local recreation opportunities.

6. River front walkway (Greenway project)

This major community and economic development project involves over 25 kilometres of walking and cycling trails along the Columbia and Illecillewaet Rivers will greatly enhance access by locals and tourists to Revelstoke's spectacular natural beauty. This project compliments and supplements the Revitalization II/Community Enhancement project in the community's quest to help diversify the economy through the tourism sector.

The project began in 1993, with incremental work being done each year, totaling approximately $400,000 to date. Approximately $1.5 million is required to complete the project.

Operating costs will be the responsibility of the City and various volunteer groups. Costs are generally absorbed in the City's property management functions.

Actions: The entire project is ready to implement however funding is required.

7. Major tourism project

To enhance Revelstoke's tourism infrastructure he Tourism Development Strategy recommends that a major tourism attraction and/or additional community/public facilities be developed over the long-term. Candidate projects include:

- marina on Columbia River/Arrow Lakes
- Columbia wetland access/interpretation
- Columbia Mountains Interpretive Centre
- indoor pool

Actions: Funding is required to undertake ongoing market evaluation to identify possible options. Funding will be needed for feasibility studies of these options and to develop the selected option.

8. Snowmobile trail grooming

The BC Snowmobile Federation is in discussions with the provincial government regarding the development of snowmobile tenure in the province. The Federation is proposing a two-

tier permit system; whereby they would levy a BC permit for all snowmobiles as well as a riding permit for local areas. The permits would be purchased by users and revenues from the permits would be shared amongst the various clubs. Enforcement would be carried out by MOF, MELP (Lands or Conservation) and/or deputized volunteers. Fines would be levied for trespass infractions.

The BC Snowmobile Federation plans to develop and implement the two-tier system over the span of five years. Once legal tenure is in place, it is expected that two years will be spent educating snowmobilers regarding the new system; thereafter the permitting would be enforced.

A non-profit society has been created including members of the Snowmobile Club and the business community to develop approaches for financing trail grooming.

Actions: Revelstoke to be the first pilot area for snowmobile trail tenures.

Continuity of financing for trail grooming support.

9. Tourism training

Tourism has been identified as one of the growth sectors of the local economy. The skills of those currently employed in the industry are generally low, as are the skills of the potential industry employees. the unemployed, youth. To ensure that the human resource capacity exists to allow the tourism sector to reach its potential, better training and education is required.

Actions: Commitment from the federal and provincial governments to provide support for tourism related training opportunities in Revelstoke.

D. 2.4 Priority Initiatives

The first priority initiatives are recommended primarily to ease the impacts on the timber sector. They include:

- government examining harvesting cost issues including approval of innovative harvesting approachs and stumpage adjustments to recognize the high cost of harvesting the relatively low quality timber in this area (Initiative A. 1. a)),
- any timber supply reductions to be apportioned to the Small Business Enterprise Program managed by the government (Initiative A. 1. b)), and
- consistent with the Jobs and Timber Accord, an increase in the timber available through bid proposal sales under the Small Business Enterprise Program is recommended, with criteria recognizing existing local employment and high value producers (Initiative A 2. a))
- provide provincial funding for initiatives already underway in the community to support the forest sector and forest workers during the ongoing changes in the industry including innovative harvesting training (Initiative A.1.c), integrated forest worker development (Initiative A.1.d), forest worker skill development (Initiative A.1.e), and, recently, forest worker transition funding (Initiative A.1.f), and

- funding provided for a feasibility study to examine product options for the very high quality timber in the area, and opportunities to continue the supply of this quality timber over the longterm (Initiative A.2.c),
- continued Forest Renwal BC funding for loan financing provided through the Revelstoke Community Futures Development Corporation and the Revelstoke Credit Union for forest-based businesses (Initiative A. 2. b).

To encourage diversification of the local economy, the MAC recommends the government implement the following:

- provide funding to support the community initiative to increase tourism marketing (Initiative C. 1.), and
- ensure adequate resources and staffing at BC Assets and Lands Corporation to support expansion of backcountry businesses and promptly administer commercial tourism tenure applications (Initiative C. 2).

The provincial government has the sole responsibility for deciding to implement these high priority initiatives.

The remaining projects have merit but are not of the highest priority.

Chapter D Moving Forward

Section 3. Resource Management Projects

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Appendix D – 3.1 Report on Alternative Silvicultural Systems and Harvesting Practices

D. 3.1 Introduction

This section outlines the resource management projects the MAC recommends to implement the land use plan strategy in the Revelstoke area. There are generally three types of recommendations for each resource value:

- collection of better information
- development of new procedures, and
- monitoring the results of the recommended practices

D. 3.2 Funding Sources

Implementing and completing the following projects will be subject to available funding. Funding is generally limited so projects have been assigned a relative priority ranking.

Possible funding sources for these projects are:

- Forest Renewal BC (FRBC)
- Columbia Basin Fish and Wildlife Enhancement Fund
- Columbia Basin Trust (CBT)
- Ministry of Forests
- Ministry of Environment, Lands and Parks
- Local timber companies
- Habitat Conservation Fund
- Parks Canada

For the projects related to the municipality and rural areas such as the Bear Aware Program, possible funding sources are the City of Revelstoke and the Columbia-Shuswap Regional District.

D. 3.3 Projects and Priorities

Value	Project	Priority	Responsibility	Status/ Target completion date
a) Timber	**1.** Complete the mapping and analysis work for TFL 55, including a 20 year plan, to implement the biodiversity management approach developed for TFL 56.	First	Evans Forest Products with government funding	No action to date /October, 2000 for FDPs

Value	Project	Priority	Responsibility	Status/ Target completion date
a) Timber (continued)	**2.** Refine seral age inventories to implement guidelines in FDPs	First	Ministry of Forests/TFL licensees	Ongoing/ October, 2000 for FDPs
	3. Examine the potential to implement the biodiversity management practices developed for TFL 56 on the Revelstoke TSA and TFL 23, including 20 year plans.	Second	Ministry of Forests/Pope and Talbot	No action /2 years
	4. Reconcile differences between computer generated forecasts and local judgements of timber supply by: • continuing work to verify estimates of existing mature timber • implementing spatial analysis on all units	Second	 Ministry of Forests/ Tree Farm Licensees Ministry of Forests/TFL licensees	Before next allowable annual cut determination Ongoing Ongoing with timber supply reviews
	5. Improve growth and yield forecasting for regenerated forests by: • verifying growth potential (site indices) of local sites • improving growth forecasts	Second	Ministry of Forests/Tree Farm Licensees	Ongoing 2 years 5 years
	6. Identify and assess opportunities to reduce projected mid-term (40 – 80 years) timber supply reductions. Implement projects to test the most feasible opportunities.	Second	Ministry of Forests/Tree Farm Licensees	No action /2 years 4 years

Value	Project	Priority	Responsibility	Status/ Target completion date
a) Timber (continued)	**7.** Improve information on the implications and options for managing root rot (Armillaria) in local forests.	Third	Ministry of Forests/Tree Farm Licensees	No action /5 years
	8. Develop criteria and operational guidelines for Timber Enhanced Resource Development Zones (ERDZ-T). Identify ERDZ-T areas and implement guidelines.	Third	Ministry of Forests, Licensees	Initiated/5 years
b) Mountain caribou	**1.** Develop timber harvesting guidelines for high elevation (ESSF) forests between the 1994 operability line and the alpine parkland	First	Ministry of Forests/Ministry of Environment	In discussion/ October 2000 for FDPs
	2. Winter recreation plans are to be developed and implemented (including maps, signs and brochures) as follows:		Ministry of Environment /Ministry of Forests/BC Assets and Land Corporation	
	• non-industrialized winter motorized closure for snowmobiling from Frisby Creek to Soards Creek, excepting access to Bourne Glacier from west side	First		In progress/1 year
	• a plan similar to the Frisby Ridge plan, but including enforcement approaches and restrictions on the number of snowmobile users in the southern portion of the Caribou Basin/Ridge area	First		No action/2 years
	• plans similiar to the Frisby Ridge plan for: • Jordan River • Sale Mountain • Keystone/Standard area	Second		Some signage/3 years

Value	Project	Priority	Responsibility	Status/ target completion date
b) Mountain caribou (continued)	• Monitor snowmobiling use and, if necessary, develop plans similar to the Frisby Ridge plan for: • Mica Creek/Fred Laing Ridge • Bigmouth drainage • Nicholls Creek • Mount Hall	Third		No action/4 years
	3. Monitor the effectiveness of the Frisby Ridge winter recreation plan and research the relationship between caribou use of suitable habitat and snowmobiling/ heliskiing use	First	Ministry of Environment/ Ministry of Forests/Parks Canada	No action/2-3 year project
	4. Continue trials to develop harvesting practices in caribou habitat	First	Ministry of Forests/Ministry of Environment	Ongoing
	5. Refine information on the habitat used by the Revelstoke herd	First	Ministry of Forests/Ministry of Environment	Ongoing
	6. Monitor population changes in the Revelstoke herd.	First	Ministry of Forests/Ministry of Environ-ment/Parks Canada	Ongoing/ Approx. every 5 years
	7. Aggressively research options to create suitable habitat in young forests (i.e. promotion of rapid lichen growth)	First	Ministry of Forests/ Ministry of Environment	Ongoing/As funding is available

Value	Project	Priority	Responsibility	Status/ Target completion date
b) Mountain caribou (continued)	**8.** Examine the possibility of establishing corridors through the younger forests within the mapped caribou habitat to improve connectivity to low elevation habitats	Second	Ministry of Forests/Ministry of Environment	No action/3 years
	9. Define use of the northern area for access to Wells Gray Park	Third	Ministry of Environment	Ongoing/As funding is available
	10. Define habitat use by the Monashee herd and develop management strategies including a winter recreation plan	Third	Ministry of Environment	No action, to be done in conjunction with research on the main habitat to the west
	11. Investigate options to link the Revelstoke herd with herds that range south of the Revelstoke area including the implications of any options	Third	Ministry of Environment	As resources permit
	(also see Access Management section)			
c) Grizzly bears	**1.** Continue Local Bear Plan and Bear Coordinator	First	City of Revelstoke/ Columbia Shuswap Regional District	Annually as needed
	2. Continue West Slope Bear study to monitor populations and habitat use	First	Parks Canada/ Ministry ofForests	Ongoing

Value	Project	Priority	Responsibility	Status/ Target completion date
c) Grizzly bears (continued)	**3.** Research 'limits of acceptable change' in carnivore habitats resulting from recreational developments including commercial lodges etc.	Third	Ministry of Environment	No action/5 years
	4. Develop local grizzly bear habitat map.	Third	Ministry of Environment	Ongoing/10 years
	(also see Access Management section)			
d) Biodiver-sity	**1.** Update mapping of biodiversity corridors at 1:20,000 to facilitate planning	First	Ministry of Forests/Ministry of Environment	Partially done/October, 2000 for FDPs
	2. Reconcile the biodiversity strategy with biodiversity management in adjacent Forest Districts	Second	Ministry of Forests/Ministry of Environment	Preliminary assessment/ With Landscape Unit Plans
	3. Develop and implement a biodiversity monitoring program	Third	Ministry of Environment	No action/3 years
	4. Examine alternatives to re-establish biodiversity values on the large area of private land on both sides of Lake Revelstoke currently managed as Tree Farm 38 (the Beaumont Tree Farm)	Third	Ministry of Environment	No action/3 years
	5. Conduct research to identify habitat of the threatened (red-listed) bat in the Goldstream drainage	Third	Ministry of Environment	No action/As funding is available

Value	Project	Priority	Responsibility	Status/ Target completion date
e) Fisheries	**1.** Develop hydrological stability assessment procedures to identify thresholds applicable for the Revelstoke area and implement these procedures in the following drainages: • Akolkolex River • Drimmie Creek • Downie Creek and tributaries • Laforme Creek • Goldstream River and fish-bearing tributaries • Jordan River and tributaries • Bigmouth Creek and fish-bearing tributaries • Soards Creek	Second	Ministry of Environment	No action/2 years
f) Ungulates	**1.** Refine deer winter range mapping south of highway 1 on the west side of the Columbia River	First	Ministry of Environment/ Pope and Talbot	No action/2 years
	2. Refine moose winter range habitat attributes and monitor moose population response.	Third	Ministry of Environment	No action/10 years
g) Visuals	**1.** Implement Forest Renewal funded projects at West Twin and Adamants to develop innovative harvesting practices in viewscapes	First	Downie Timber/ Revelstoke Community Forest Corporation	Ongoing
	2. Complete visual inventory for the area	First	Ministry of Forests	Ongoing/ October, 2000 for FDPs

Value	Project	Priority	Responsibility	Status/ Target completion date
g) Visuals (continued)	**3.**Identify and examine the opportunities to undertake 'rehabilitation' harvesting in key viewscapes where past harvesting is not consistent with the recommended visual management guidelines Implement suitable projects where environmental values are not unduly compromised	Second Second	Ministry of Forests Licensees	Initiated 5 years
	4. Continue to develop viewscape design expertise in the local industry	Second	Ministry of Forests/ Licensees	Initiated/ Ongoing
	5. Designate scenic areas as Known Scenic Areas under the Forest Practices Code during initial landscape unit planning	Second	Ministry of Forests	Designated known for FDPs/With Landscape Unit Plans
	6. Revise the Lake Revelstoke Plan to be consistent with these recommendations	Second	Ministry of Forests	No action/4 years
	7. Develop viewscape management guidelines for skihill developments.	Third	Ministry of Small Business, Tourism and Culture/Ministry of Forests	No action/10 years
h) Water-sheds	**1.** Consideration be given to options for limiting domestic animal and human use of community watersheds	Second	Ministry of Environment	No action/1 year

Value	Project	Priority	Responsibility	Status/ Target completion date
h) Water-sheds (continued)	**2.** Review and revise the Dolan Creek Integrated Watershed Management Plan to ensure consistency with the Code and the Community Watershed guidebook	Third	Ministry of Forests	No action/4 years
i) Recreation	**1.** Examine areas for expansion of snowmobiling, principally south of town.	First	Ministry of Forests/Snow-mobile Club	No action/2 years
	2. Update the Lake Revelstoke Plan.	Third	Ministry of Forests	No action/4 years
j) Access manage-ment plans	**1.** Develop access management plans, including road densities where appropriate, for the following areas to address grizzly bear, mountain caribou and mountain goat management concerns:		Ministry of Forests	
	• Westside of Columbia River from Frisby Creek to Pat Creek	First		In progress/1 year
	• Tangier River, Woolsey Creek, Downie River/ Sorcerer Creek, Akolkolex River, Carnes Creek	Second		No action/2 years
	• Goldstream River, Bigmouth drainage	Third		No action/3 years
k) Mining	**1.** Complete ongoing development of guidelines for placer (gold, etc.) mining in riparian areas	First	Ministry of Energy and Mines	Underway
	2. Review no-staking reserves and recommend amendment or deletion of redundant or unnecessary ones, as appropriate	Second	Ministry of Energy and Mines	Underway

Value	Project	Priority	Responsibility	Status/ Target completion date
k) Mining (continued)	**3.** For road deactivations that are not part of watershed restoration projects (WRP), extend the existing WRP consultation process to affected mineral and placer tenure holders	Third	Ministry of Energy and Mines	No action/1 year
	4. Conduct geoscience studies to enhance geological knowledge and attract exploration investment	Fourth	Ministry of Energy and Mines	As resources permit

The MAC also provided the Minister with recommendations in March, 1996 regarding alternative silviculture system and harvesting practices. This report is included in this section as Appendix D - 3.1.

Appendix D - 3.1

Revelstoke and Area
Minister's Land-Use Planning Advisory Committee

Report on Alternative Silvicultural Systems and Harvesting Practices

March, 1996

This report has been prepared to fulfill the portion of the mandate of the Revelstoke and Area Minister's Land-Use Planning Advisory Committee to *'provide advice on ...alternative harvesting and silviculture techniques'*. These recommendations are being submitted before the final report is prepared because of the importance of these issues and the need for action as soon as possible. Further advice on these topics may be provided in the Committee's final report.

This report is based on presentations made to the Minister's Advisory Committee by timber company staff, logging contractors and local Ministry of Forests and Ministry of Environment, Lands and Parks representatives.

Background

The steep terrain, wet, snowy climate and very old, relatively low quality timber in the Revelstoke District create difficult timber harvesting conditions more similiar to the coast of British Columbia than the interior.

Before 1985, timber harvesting in the area occurred in large clearcuts logged with 'conventional' ground-based harvesting equipment. In most cases, pulp quality timber was felled and left on harvested areas. During the past 10 years, harvesting practices have changed, with smaller and smaller clearcut patches being logged primarily with cable yarding equipment. All of the timber is now removed from the site and planting is completed promptly after harvesting to minimize reforestation costs. These changes in harvesting practices have been implemented to meet integrated resource management objectives, particularly for biodiversity, ungulate (especially caribou) habitat management and viewscapes. Substantial public concern about past practices has also prompted these changes.

These changes were accomplished through significant effort by everyone involved in timber harvesting in the area. Technical forestry personnel in the timber companies, consulting firms and the Forest Service learned new skills to assess and plan cable

harvesting in smaller clearcuts and partial cuts. Logging contractors invested in expensive cable yarding equipment. The loggers are steadily increasing their knowledge of cable yarding techniques to safely and productively operate in these new conditions.

Current practices and plans

Currently, the majority of the timber is harvested in small clearcuts which are usually 10 to 18 hectares. Approximately 80% of the timber is harvested by cable yarding, with the remainder mainly by ground skidding with low ground pressure equipment in the winter and summer. A small amount of helicopter logging has been done where expensive road construction or non-timber resource values precludes the use of cable or conventional equipment. While this practice can only be used when timber values and market prices justify the relatively high cost of helicopter logging, it is expected that helicopter logging will increase in the future.

The pattern of small clearcuts expected to be logged in the future requires that a substantial amount of forested area be roaded and impacted by timber harvesting. There are several significant negative implications of this pattern compared to larger clearcuts:

- there is less opportunity to leave areas of older forest intact
- higher planning and layout costs
- higher road development and maintenance costs are required for the amount of timber harvested
- increased average tree to truck costs will be incurred, but will not be recouped through the current timber appraisal system

On the other hand, in comparison to large clearcuts, smaller clearcuts provide benefits which are particularly important in the Revelstoke area:

- lower risk of slope failuress following harvesting, especially in areas with unstable soils
- lower risk of avalanche paths expanding
- less visual impact
- more suitable for caribou habitat

From a timber management perspective, smaller clearcuts also have several advantages over partial cutting systems (i.e. clearcuts with reserves, seed trees, shelterwood or selection systems):

- safer working conditions
- less waste
- certainty of artificial regeneration success following harvesting

- easy and efficient operations
- lower costs and thus, in the case of the Small Business Program, greater revenues to the Crown
- easier salvage of wind or pest damage
- reduced risk of root rot losses

However, the Revelstoke area also has a wealth of high value non-timber resources such as mountain caribou, biodiversity and viewscapes which require that some forest cover be maintained at all times. While, on some parts of the landscape, forest cover can be provided by areas that are not suitable for timber management due to soil instability, riparian values, or wildlife habitat, it is agreed that partial cutting practices need to be tested. This is currently being acted on through a variety of initiatives:

- Current harvesting plans are being amended to include small reserve areas which will not be harvested within some cutblocks to provide biodiversity. It is not intended that these reserves will be harvested.

- Single-tree and group selection harvesting have been proposed for a wildlife travel corridor where mainly ground skidding is possible.

- Altered cutblock design is being tested for ‘ski’ cuts where cutblocks are oriented up and down the slope rather than along the slope as in past.

- A ‘caribou’ cut has been designed and is being tested where 25% of the timber in an area will be removed in 1 hectare patches. The remaining timber is scheduled to be harvested in the same manner, with harvesting occurring at approximately 40 year intervals.

- An area has been laid out with patches as small as 0.2 hectares in an attempt to meet ‘Retention’ Visual Quality Objectives without significantly affecting the short-term timber availability.

- Partial cutting ‘shelterwood’ or modified seed-tree harvesting has been proposed on relatively flat ground to salvage insect damaged stems.

For the most part, these practices can be implemented with the current harvesting equipment and expertise. Partial cutting practices where a substantial amount of the timber is left on the site is expected to require different harvesting equipment and additional skills within the logging force. The local timber industry is willing to implement new techniques, and applications have been made to Forest Renewal B.C. for funding support to develop and test practices that will be suitable for backcountry lodge and highway viewscapes.

While the industry and the Forest Service are moving forward to test new practices, these practices are being implemented in a piecemeal manner due to the uncertainties regarding land-use in the area. At this point, it is not possible to identify the landscapes requiring particularly sensitive practices, which leads to unclear management objectives and extensive planning costs and delays. In addition, there is a sense of frustration with the ongoing changes and 'moving goalposts' for timber harvesting in the area.

Challenges of non-clearcut options

While the timber industry is willing to test non-clearcut harvesting options and new harvesting techniques, several difficulties with implementing these new practices have been identified:

- The lack of clear **resource management objectives** at the landscape and stand level make it difficult to define where non-clearcut options are needed. Expertise and energy needs to be focused on the areas where current planning indicates there are significant non-timber resource management objectives.

- **Past harvesting patterns** have limited the silvicultural and harvesting options that are possible in some areas.

- The forests in the area, which are characterized as natural disturbance types 1 and 2, have produced relatively large, undisturbed areas of old-growth forests. This pattern is fragmented when partial cutting practices are implemented to address non-timber resource management objectives. **Biodiversity** must then be managed in some different fashion.

- Timber harvesting contractors need the appropriate **harvesting tools and expertise** to successfully implement non-clearcut options. This includes obtaining the necessary equipment and personnel training, broadening their experience, ensuring financial stability of the industry through fair appraisal allowances and developing approaches which permit operators to amend the logging layout when faced with safety or operational problems.

- Possible sources of increased **risk** with non-clearcut harvesting in the terrain and timber conditions in the area include:
  - worker safety hazards and WCB liability
  - increased timber breakage during harvesting
  - fire hazard abatement under the remaining stems may not be possible
  - stem breakage in remaining stems, particularly due to greater snowloads on individual trees

- regeneration success is untested
- greater reliance on fewer, primarily shade tolerant species
- lengthened green-up periods, and possibly timber supply implications
- blowdown, particularly following heavy snowfalls
- root rot is expected by some to expand more rapidly following partial cutting

- Timber companies and the Forest Service have **limited recent experience**.in planning, harvesting and reforesting non-clearcut areas in the interior wet belt.. While this expertise could be imported, it is expected that locally developed approaches will be required due to the steep terrain, ecological conditions, timber quality and climate.

- The timber industry expects **delays in harvesting approvals** from the Ministry of Forests because government staff will be uncertain of the ecological and practical feasibility of proposed plans, but the Forest Practices Code requires certainty before the District Manager can accept the liability inferred by approving plans.

- Non-clearcut harvesting is expected to increase **costs** substantially in all phases of operations:
  - planning costs are estimated to be 2 to 7 times higher
  - initial road construction and subsequent maintenance costs increase as more roads are needed to access the same volume of timber within a given area
  - increased tree to truck costs due to increased capital costs and decreased daily production
  - additional reforestation costs

- The Committee has heard representation from the timber industry that the **timber appraisal system** does not adequately reflect the current costs of operating in the interior wet belt. Consequently, the appraisal system may not account for the additional costs of alternative harvesting practices..

- The Committee has heard representation from the Forest Service that the **funding levels for planning and layout in the Small Business Forest Enterprise Program** (SBFEP) are inadequate for the local district to meet current Forest Practices Code requirements or to substantially expand the implementation of the alternative harvesting practices.

- The **timber growth** implications of non-clearcut options are not known. Given that the timber supply for the Revelstoke Timber Supply Area is already projected to decline substantially in the future, further constraints on the supply should be avoided.

Recommendation

Based on the information provided, the Committee recommends the following opportunities be pursued:

- The local timber industry and loggers deserve to be recognized for the changes in harvesting practices they have already achieved. This adaptability is a strength that will be needed to experiment with non-clearcut options.
- The land-use planning process should be completed as soon as possible to define the areas designated for management of high value non-timber resources and thus where non-clearcut options may be needed.
- Options for reducing the real and perceived constraints to innovation created by the Forest Practices Code should be investigated.
- The Forest Service and WCB should clarify worker safety requirements in non-clearcut harvesting practices and develop solutions to ensure worker safety is not jeopardized in non-clearcut harvesting.
- Communication between the individuals and organizations involved in developing and testing non-clearcut alternatives could be improved.
- Local technical expertise in planning and harvesting with alternative methods should be developed as soon as possible. Training for loggers to implement new practices safely should also be made available.
- Trials of partial cutting silvicultural systems and harvesting methods should continue to be developed where high value non-timber resources are recognized, such as the Begbie Falls Integrated Resource Plan area, Adamants Lodge, caribou habitat and the Highway 1 corridor. To minimize costs, as much as possible trials should be located where roads are already in place.
- The Ministry of Forests should be urged to revamp the stumpage appraisal system to more equitably recognize the actual operating costs in the interior wet-belt.
- Forest Renewal B.C. should provide funding to local companies and the Forest Service to develop non-clearcut harvesting trials and to test alternative harvesting techniques where the innovating organization would otherwise have to absorb the incremental costs of high risk trials.
- Clearcut patches or contiguous, non-greened-up areas larger than the Forest Practices Code limitation should be considered where appropriate to minimize the area developed, reduce fragmentation of old-growth forests and reduce costs on a portion of the land base.
- Funding levels for planning and layout in the Small Business Forest Enterprise Program should be increased to ensure the local forest district can both meet

the current Forest Practices Code requirements and expand the implementation of alternative harvesting practices.

Glossary

Access management plan -- In general usage, a plan that shows how and where, for a particular area, access will be provided or limited. Within the context of Forest Practices Code usage, an access management plan is an operational plan that shows how and where road construction, modification and deactivation will be carried out for areas not covered by forest development plans to protect, or mitigate impacts on known resources or sensitive locations, while maximizing the efficiency of resource development

Adaptive resource management -- An approach to managing uncertainty that emphasizes learning by trial. Management policies and practices are adopted, based on best available information, and are monitored to assess effects. Adaptations to those policies and practices are made periodically, on the basis of monitoring and research information.

Agroforestry -- Management (including harvesting) of non-fibre forest resources such as mushrooms, berries, floral cuttings.

Allowable annual cut (AAC) -- The permitted rate of timber harvest from a specified area of land. The chief forester sets AACs for timber supply areas and tree farm licenses in accordance with Section 7 and/or Section 170 of the Forest Act. The district manager sets AACs for woodlot licenses. May also refer to a portion of the total AAC for the management unit (e.g., TSA) partitioned to a single harvesting agreement (i.e., forest license, timber sale license).

Animal unit month -- The amount of forage required to feed a mature one thousand pound cow with or without unweaned calf at her side, or equivalent (one two-year-old horse or five deer) for one month. Grazing stock rates are often expressed as AUMs per hectare or hectares per AUM. Grazing tenures for ranch operations are issued on the basis of AUMs.

Archaeological assessments -- Assessments based on fieldwork and ethnography research of the location, significance and sensitivity of archaeological resources in a given area. Such assessments may be undertaken at an overview or site level. Archaeological impact assessments are undertaken to identify the potential risk to archeological resources from a specific proposed resource development, and to identify the means to mitigate impacts on those resources.

Backcountry tourism -- Commercial tourism activities that are conducted in relatively remote areas of the region, and which are reliant upon access to, and maintenance of, the region's natural amenities (e.g., scenic viewscapes, wildlife populations, solitude, water quality, etc.)

BC Skills Now -- A provincial program designed to provide British Columbia workers with the skills necessary to successfully secure new employment opportunities.

BC 21 program -- A provincial program to invest in regional and community infrastructure and services.

Biodiversity -- The diversity of plants, animals and other living organisms in all their forms and levels of organization, including genes, species and ecosystems and the evolutionary and functional processes that link them.

Biodiversity emphasis -- Pursuant to the FPC Biodiversity Guidebook, the relative emphasis that is placed on the maintenance of biodiversity for a particular area (normally a landscape unit), mainly through the application of resource management practices to retain old seral vegetation and provide connectivity linkages within and between ecosystems. The FPC Biodiversity Guidebook identifies three biodiversity emphasis levels -- high, intermediate and low -- and assigns recommended management criteria to each level. The KBLUP assigns biodiversity emphasis levels to all Crown lands in the region.

Blue-listed species -- Sensitive or vulnerable species, as identified by the Ministry of Environment, Lands and Parks. Blue listed species are considered to be vulnerable and "at risk", but not endangered or threatened. Populations of these species may not be declining but their habitat or other requirements are such that they are sensitive to disturbance. The blue list also includes species that are generally suspected of being vulnerable, but for which information is too limited to allow designation in another category.

Canada / B.C. infrastructure program -- A program established under a federal - provincial agreement to invest in regional and community infrastructure projects such as highways.

Capability (land) -- The natural biological and physical ability of an area of land to support a particular management activity or use. (e.g., soil capability for agriculture; habitat capability for waterfowl). Capability depends upon site conditions such as climate, slope, exposure, landform, soils and geology.

Coarse woody debris -- Sound and rotting logs and stumps that have the potential to provide habitat for fungi, plans, animals and insects and their predators, and that provide a source of nutrients for soil development.

Columbia river downstream benefits -- The funds flowing to the province and the Kootenay region as a result of renegotiation of the 1964 Columbia River Treaty. The funds allocated for investment into the Kootenay region are managed by the Columbia River Trust.

Commission on Resources and Environment (CORE) -- An independent organization created by the British Columbia government whose mandate (as defined in the *Commissioner on Resources and Environment Act*) was to "develop for public and government consideration a British Columbia-wide strategy for land use and related resource and environmental management". CORE sponsored East Kootenay and West Kootenay-Boundary regional planning processes between 1992 and 1994.

Community watershed -- Defined in the *Forest Practices Code of British Columbia Act*, section 41(8) as:

a) the drainage area above the most downstream point of diversion on a stream for a water use that is for human consumption and that is licensed under the *Water Act* for

- a waterworks purpose, or
- a domestic purpose if the license is held by or is subject to the control of a water users' community incorporated under the *Water Act*

if the drainage area is not more than 500 square kilometres and the water license was issued before June 15, 1995 or,

b) an area that is designated as a community watershed under subsection (10).

Sub-section 10 states that the regional manager may designate an area as a community watershed if:

a) in the opinion of the regional manager and a designated environment official it should be designated as a community watershed,

b) the area is all or part of a drainage area above the most downstream point of diversion for a water use that is for human consumption and that is licensed under the *Water Act* for a domestic purpose or a waterworks purpose, and

c) the area is not an area referred to in subsection (8)(a).

Connectivity corridors -- Land and water areas with characteristics that make them suitable for providing biodiversity linkages among late sucessional ecosystems. Maintenance of connectivity corridors is considered important to long term biodiversity health through the provision of opportunities for genetic, species and ecosystem movement over time.

Consensus seeking planning -- Multi-stakeholder planning processes that seek to produce a consensus on land use and natural resource management among the planning participants. A consensus is a general agreement on a package of provisions, even if there is not complete concurrence on each aspect.

Consultation (public) -- Democratic activities undertaken to identify the viewpoints, preferences and priorities of the public with respect to particular issues or initiatives, with a view to integrating the public's suggestions into decisions as a means of making the decisions more informed, sound and stable. Public consultation methods are many, ranging along a continuum of increasing interaction, level of commitment by the parties, cost, time and influence. The consultation mechanisms that are employed in any given situation are normally based on an assessment of the issue-specific circumstances, and an articulation of the particular objectives behind the consultation initiative.

Desired plant community -- A plant community that produces the kind, proportion and amount of vegetation necessary for meeting the land use plan requirements or ecological site objectives. The desired plant community must be consistent with the site's capability to produce the desired vegetation through management, land treatment or a combination of the two.

Domestic watersheds -- Watersheds which are licensed for human consumption but not designated as "community watersheds" -- see above.

Ecosystem -- A functional unit consisting of all the living organisms in a given area, and all the non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be of any size -- a log, pond, field, forest or the earth's biosphere -- but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation, for example, forest ecosystem or grassland ecosystem.

Ecosystem-based management -- An approach to land and resource planning and management that emphasizes the recognition and maintenance of ecosystem function and structure.

Enhanced resource development zone -- ERDZ (Coal) -- a land use designation category encompassing areas of known coal reserves and existing coal mining and related activities. The Coal ERDZ signifies an assurance of long-term access to the subject lands for coal mining, exploration and development, contributing to investor confidence and general coal industry viability in the region.

Enhanced resource development zone -- ERDZ (Timber) -- a land use designation category encompassing lands with suitability for timber management activities, and upon which relatively intensive timber management investments and practices are appropriate.

Environmental assessment -- A process, initiated under authority of the provincial *Environmental Assessment Act*, to identify and evaluate the environmental (and typically also the social and economic) effects of a proposed development (e.g., mineral, energy, industrial or commercial development) and to identify ways to mitigate potentially negative effects of the development, as a basis for a government decision on whether or not and how the proposed development should proceed..

Environmental supply review -- a periodic assessment of the quantity, distribution and overall health of the region's environmental resources, with a view to adaptively using the assessment information to amend land use plans and resource management policies and procedures, in pursuit of the overall goal to conserve the health of the region's ecosystems.

Forest ecosystem network (FEN) -- An area of land or water that serves to maintain or restore the natural connectivity within the components of an ecosystem, and between ecosystems.

Forest land reserve -- Land designated under the *Forest Land Reserve Act*. This includes private land within a tree farm license and private land classed as managed forest land under the *Assessment Act*, as well as designated Crown land in the provincial forest. Removal of land from the reserve is restricted, as is the use and subdivision of the land. The purpose of the reserve is to maintain the commercial working forest of British Columbia.

Forest Practices Code (FPC) -- The legislation (including the *Forest Practices Code of British Columbia Act* and associated regulations), standards, and guidebooks that govern forest practices in British Columbia. Forest practices include timber harvesting, road construction/maintenance/use/deactivation, silviculture treatments, botanical forest product collecting, grazing, hay cutting, fire use/control/suppression, etc.

Forest Renewal B.C. -- A crown corporation that is responsible for managing the provincial Forest Renewal Plan investments. The Forest Renewal Plan is a long-term plan for investment in BC's forests, designed to enhance the productive capacity and value of forest lands and resources, create jobs, provide training for forest workers and strengthen forest dependent communities.

Frontcountry tourism -- Commercial tourism products that are offered in communities and along main travel corridors, such as golfing, accommodation and campgrounds.

Guidebooks -- One of the four main components of the Forest Practices Code (The others are the *Forest Practices Code of British Columbia Act*, the regulations and the standards). The guidebooks support the legislation, regulations and standards but are not part of the legislation. These "how-to" guides detail the Code's recommended procedures, processes and results. They give information on how to make site-specific interpretations and modifications to the requirements identified by the Code. The guides become legally enforceable when the specifications and procedures recommended by the guidebooks are incorporated into plans, prescriptions and tenure contracts.

Guideline -- A preferred or advisable course of action respecting land and resource management. Guidelines imply a degree of flexibility, based on administrative judgment or feasibility to apply the guideline and are consequently not normally enforceable through legal means. (The KBLUP identifies a series of resource management guidelines which, when used in combination with resource value maps, provide geographically specific management direction for individual resource values).

Grazing enhancement fund -- An allocation of provincial funds dedicated to enhanced development and management of grazing resources.

Higher level plan -- As defined under the *Forest Practices Code of British Columbia Act*,

a) a plan formulated pursuant to section 4(c) of the *Ministry of Forests Act* and designated as a higher level plan by the district manager in accordance with direction from the chief forester,
b) a management plan designated as a higher level plan by the chief forester for tree farm licenses and by the regional manager for other agreements under the *Forest Act*,
c) an objective for a resource management zone,
d) an objective for a landscape unit or sensitive area,
e) an objective for a recreation site, recreation trail or interpretive forest site, and
f) a plan or agreement declared to be a higher level plan by:
- the ministers, or
- the Lieutenant Governor in Council under this or any other Act.

Higher level plans supply guidance and direction for operational plans. Operational plans are required to be consistent with higher level plans that are in effect for the geographic area covered by the operational plan.

Identified wildlife -- Defined in the *Forest Practices Code of British Columbia Act*, Operational Planning Regulation, as those species at risk that the Deputy Minister of Environment, Lands and Parks, or a person authorized by that deputy minister, and the chief forester, agree will be managed through a higher level plan, wildlife habitat area, or general wildlife measure.

Ingrowth -- Vegetative growth occurring in grassland ecosystems (natural disturbance type 4) due to human suppression of naturally occurring fires.

Integrated resource management -- A holistic resource management philosophy and approach where the underlying intent is to share and coordinate among a broad range of values and interests when conceiving, designing and implementing land and resource policies, programs, plans or projects.

Integrated resource management zone (IRMZ) -- a land use designation category within which the primary objective is to balance and optimize environmental, economic and social benefits from the resource values within the zone.

Key alpine habitats -- Whitebark and Limber pine stands, sub-alpine riparian shrublands, alpine meadow complexes and grassland ecotones, avalanche tracks, watershed headwater areas and basin ecosystems and other high elevation ecosystems commonly associated with the following principle environmental characteristics:

- short lapse rate (impact on the length and warmth of the growing season, phenological window)
- low temperature
- high radiation receipts
- azonal soils
- high gradients.

Kootenay Inter-Agency Management Committee (IAMC) -- The interagency committee of senior land and resource management officials in the Kootenay region. The committee is responsible for integrating and coordinating all land and resource planning and protected areas work in the region and for setting regional planning priorities.

Kootenay Regional Advisory Group (KRAG) -- A multi-stakeholder committee with a mandate to provide advice to the provincial government on regional and community economic development and transition in the Kootenay region.

Land Use Coordination Office (LUCO) -- The provincial government office established to coordinate the administration of inter-agency land use planning, advise government on land use policy, and to coordinate the management of land and natural resource inventory programs for the province.

Landscape level planning -- Planning intended to develop resource management objectives and strategies for resource management in a particular landscape unit or a grouping of landscape units.

Landscape unit -- A planning area established under the *Forest Practices Code of British Columbia Act* by the district manager, up to 100,000 hectares in size, based on topographic or geographic features such as a watershed or a grouping of watersheds.

Land use designation category -- A category of land use employed in a land use plan to describe and communicate an indented land or resource use direction for the lands covered by the designation category. Land use designations in strategic land use planning may indicate a priority or dominant land use, as well as subdominant uses.

Local level strategic planning -- In the hierarchy / continuum of land use planning levels, ranging from regional to site planning, a local level strategic plan is a plan that focuses on greater management detail than the plan "above it", from which it receives guidance and management direction.

Management direction statement -- A summary statement indicating interim management direction for a protected area, pending the eventual development of a park master plan.

Mine reclamation -- the rehabilitation of land and watercourses, after mining activities cease, to a state productive of future use. Level of productivity must be equal to or better than existed before mining, on a property-wide basis.

Mitigating strategies -- In the context of land/resource management, those actions or practices aimed at improving compatibility between land uses. Mitigating strategies include efforts to avoid, minimize, rectify, reduce or compensate for the impact of one land use on another. In the context of socio-economic impact mitigation, those actions and initiatives, taken over the short, medium and long tern, to reduce or minimize impacts and disruptions to communities and residents that are potentially associated with sudden change to the economic base of those communities.

Natural environment setting -- A classification level in the recreation opportunity classification scheme, within which the management intent is to minimize the roaded character of the area. These areas are small and may have roads into the area, but not through the area. Landscape alterations are minimal. These areas provide a reasonable degree of isolation from the sights and sounds of motorized activity in a naturally appearing setting.

Natural disturbance types (NDT) -- A term used in the FPC biodiversity guidebook to characterize areas with different natural disturbance regimes. Five natural disturbance types are recognized as occurring in B.C.:

NDT1 - Ecosystems with rare stand-initiating events
NDT2 - Ecosystems with infrequent stand-initiating events
NDT3 - Ecosystems with frequent stand-initiating events
NDT4 - Ecosystems with frequent stand-maintaining fires
NDT5 - Alpine tundra and sub-alpine parkland ecosystems.

Official community plan -- A land use plan that is developed and approved for a municipality or regional district according to the requirements of the *Municipal Act.*

Objective -- A statement of a desired condition respecting lands, resources or communities in a planning area. Objectives may be described broadly which apply across an entire region, or for particular geographic areas.

Old growth management area -- Defined in the *Forest Practices Code of British Columbia Act,* Operational Planning Regulation, as an area established under a higher level plan which contains or is managed to contain structural old growth attributes (such as maintenance of large trees, variation in tree size/spacing, accumulation of large dead standing and fallen trees, multiple canopy levels, elements of decay, etc.)

Operability line -- The line (usually an elevation) beyond which timber harvesting becomes uneconomic and/or technically unfeasible due to hauling distance, steep slopes, soil instability, timber quality, environmental concerns, etc. Operability can change over time as a function of changing harvesting technologies and economics.

Operational plan -- A resource management plan that contains detail on the logistics for resource use / development in a particular area. Methods, schedules and responsibilities for accessing, harvesting, renewing and protecting resources are set out to enable site-specific operations to proceed. As described in the *Forest Practices Code of British Columbia Act*, operational plans include forest development plans, logging plans, access management plans, range use plans, silviculture prescriptions, stand management prescriptions and five year silviculture plans.

Park master plan -- A comprehensive plan that describes the future management direction for a protected area.

Patch size -- A stand of similar-aged forest that differs in age from adjacent patches by more than 20 years. When using the term patch in designing landscape patterns, it refers to the size of either natural disturbance openings which led to even-aged forests, or those openings created by cutblocks.

Polygon -- A unit of land depicted on a map that contains an area of similar characteristics.

Potential natural community -- The biotic community that would become established on a site if all successional sequences were completed under present environmental conditions without interference by humans.

Protected area -- A designation for areas of land and water set aside to protect natural heritage, cultural heritage or recreational values (may include national park, provincial park or ecological reserve designation).

Protected Areas Strategy (PAS) -- The provincial strategy to develop and expand British Columbia's protected area system to encompass 12% of the provincial land base by the year 2000.

Provincially significant -- An interpretive rating, in a rating hierarchy, applied to a particular resource values to indicate their relative uniqueness or scarcity. Provincially significant values are unique and important within a provincial context, given their rarity or scarcity, or the

economic, social or environmental contribution that they make to the province (as compared to regionally or locally significant resource values). Strategic land use planning is normally limited to the consideration of provincially or regionally significant resource values.

Rangeland ecosystems -- Natural grasslands, open forests, seral shrub grassland, alpine grassland, seeded rangeland and early seral cutblocks.

Rangeland management regimes -- includes activities to manipulate the levels of range utilization, timing and duration of grazing, distribution and stocking rates. Management regimes may apply to both livestock and, to a lesser degree, wildlife species. In the case of livestock, management techniques include the implementation of modification of grrazing systems, the construction of livestock management facilities such as fences, gates, cattleguards and stock trails, proper salt placement, development of stockwater facilities, and range riding.

Rare, threatened or endangered species -- see "blue-listed" and "red-listed" species.

Recreation opportunity spectrum (ROS) -- A recreational classification system that is used to classify areas in terms of the type of recreational experience that a recreation user would have in that area, based on an assessment of the area's remoteness, size, evidence of humans, social setting, and setting characterization. The six ROS classes are natural, primitive, semi-primitive non-motorized, semi-primitive motorized, roaded resource land and rural.

Red-listed species -- Threatened or endanger species identified by the Ministry of Lands, Parks and Housing. Plants or animals named on the red list are either extirpated, endangered or threatened, or are being considered for such status. Any indigenous species or sub-species threatened with imminent extinction or extirpation throughout all or a significant portion of its range in B.C. is endangered. Threatened indigenous species or sub-species are those that are likely to become endangered in B.C. if conditions are not altered.

Regional biodiversity benchmark -- A statement of the desired condition and desired spatial extent, in the Kootenay region, of regionally significant fish streams, caribou species and habitats, ungulate winter range, representative ecosystems and regional connectivity and grizzly bears - as primary indicators of regional biodiversity health. The benchmark will be used to monitor overall regional biodiversity levels in the region over time.

Regional growth strategy -- A strategic plan related to human settlement, initiated under authority of the provincial *Growth Strategies Act*, for a regional district or group of regional districts, to identify a regional vision that commits affected municipalities and regional districts to a course of action to meet common social, economic and environmental objectives. A regional growth strategy must cover a period of at least 20 years and it must include population and employment projections and actions to meet the needs of future residents in relation to housing, transportation, services, parks/natural areas and economic development.

Regional objectives and strategies -- Statements of land use and natural resource management intent (objectives), and the means of attaining that intent (strategies), that apply to resource values and sectors throughout the entire region.

Regionally significant -- An interpretive rating, in a rating hierarchy, that is applied to particular resource values to indicate their relative uniqueness or scarcity. Regionally significant values are unique and important within a regional context, given their rarity or scarcity, or the economic, social or environmental contribution that they make to the region (as compared to provincially or locally significant resource values). Strategic land use planning is normally limited to the consideration of provincially or regionally significant values.

Resource management guidelines -- The statements contained in Appendix 2 of the KBLUP that describe the specific resource management practices, standards and procedures that apply within the planning area.

Revelstoke Minister's Advisory Committee -- A multi-sectoral group comprised of representatives from the Revelstoke area with a direct interest in land use and natural resources management. This committee was appointed by the Minister of Forests in 1995 to advise on the development of resource management and socio-economic objectives and strategies for the Revelstoke TSA.

Riparian reserve -- A geographic zone defined in the *Forest Practices Code of British Columbia Act*, Operational Planning Regulation, as that portion, if any, of the riparian management area or lakeshore management area located adjacent to a stream, wetland or lake of a width determined in accordance with Part 10 of the Regulation.

Roaded resource lands -- A classification level in the recreation opportunity classification scheme, within which the management intent is to provide opportunities for dispersed and facility oriented recreation. These lands are accessed by better than primitive roads and are suitable for most conventional 2 wheel drive vehicles. These lands have been altered by man and the alterations are visible on the landscape.

Semi-primitive motorized recreation -- A classification level in the recreation opportunity classification scheme, within which the management intent is to provide for dispersed motorized recreation. These areas are accessed by primitive roads or trails, suitable for high clearance 4 wheel drive vehicles, motorcycles, ATVs and snowmobiles.

Semi-primitive non-motorized recreation -- A classification level in the recreation opportunity classification scheme, within which the management intent is to maintain the unroaded character of the area and to provide opportunities for dispersed non-motorized recreation.

Sensitive Areas -- Small areas established under the *Forest Practices Code of British Columbia Act* by MOF district managers to manage or conserve unique or locally significant resource values.

Settlement land uses -- Land uses authorized under authority of the *Land Act*, including, but not limited to, land used for the following purposes: residential, institutional/community, small parcel intensive agriculture, industrial, quarries, commercial, communications facilities, utilities, community park facilities and extension to existing private land holdings. Settlement uses are predominantly located within and/or adjacent to existing municipal boundaries; in areas outside of municipal boundaries that adjoin or are proximate to the existing mosaic of private land; in

areas within linear settlement corridors that reflect the past pattern of land settlement and development; or in resort development areas that are focused primarily on tourism and supporting accommodation and infrastructure facilities.

Scenic areas -- Defined in the *Forest Practices Code of British Columbia Act*, Operational Planning Regulation, as any visually sensitive area or scenic landscape identified through a visual landscape inventory or planning process carried out or approved by the district manager.

Shared decision-making -- An approach to public participation in decision-making (especially land use planning) in which, on a certain set of issues for a defined period of time, those with authority to make a decision and those affected by that decision are empowered jointly to seek an outcome that accommodates the interests of all concerned.

Silviculture system -- A planned program of treatments throughout the life of the stand to achieve stand structural objectives based in integrated resource management goals. A silvicultural system includes harvesting, regeneration and stand-tending methods, covering the entire length of a rotation or cutting cycle.

Small business bid proposal -- A program through which the Ministry of Forests sells Crown timber competitively, on the basis of solicited bids, to individuals and corporations registered in the program. Proposals may be evaluated in terms of stumpage bid, as well as other criteria including employment creation.

Special resource management zone (SMRZ) -- the land use designation category applied to areas with high concentrations of regionally significant and sensitive resource values, including critical fish and wildlife habitat, under-represented ecosystems, important viewscapes, sensitive recreation areas and cultural heritage features. Areas designated as SRMZ communicate the general resource management priority to maintain the integrity of the numerous special and sensitive values that are known to exist in those areas.

Strategic land use plan -- The product of a land use planning process at the regional, sub-regional and, in some cases, at the local level, which provides land and resource allocation and management direction. Strategic land use plans involve the identification of resource management zones, objectives and strategies. They provide direction and guidance to field level policy and program development, in day-to-day administrative decision-making, and to future lower-level planning processes.

Strategy -- A means of achieving an objective. Strategies may be general or specific in nature, and may describe a resource management standard, guideline, policy or procedure.

Sub-unit -- A geographic area within a land use designation zone for which specific land and resource management direction is provided. The Kootenay region was subdivided into ?? separate sub-units, as a basis for describing geographically-specific land and resource management direction.

Suitability (land) -- The degree to which a particular use or activity is considered appropriate on a given area of land, as interpreted from an assessment of a variety of factors, including biophysical capability of the land and socio-economic considerations.

Support zones -- areas adjacent to protected areas, parks, wildlife habitat areas, sensitive areas or critical habitats which buffer a marked change in resource management emphasis enabling a gradual impact to environmental values. This is accomplished with strategic biodiversity emphasis allocation, guideline application by environmental value, access management, or connectivity management through the Higher Level Plans Policy and Procedures document.

Target -- The quantification of a land use / resource management objective. A target might apply to the entire region (e.g., a regional short term timber availability target), or it might pertain to a particular geographic area (e.g., proportion of a sub-unit to be managed at 'high emphasis biodiversity' level). Resource management targets indicate a desirable or plausible resource production output, allocation amount, or a timeline within which an action is intended to be initiated or completed. Resource management targets provide directive guidance to resource managers in plan interpretation and implementation, but are *not* binding on the authority of statutory decision-makers to exercise their discretion in making resource management and administrative decisions for which they are legally responsible.

Total resource plan -- An integrated resource management plan for an individual watershed or landscape unit that specifies the 'total' long-term development sequence / regime for that watershed or unit.

Tree farm license (TFL) -- An agreement entered into under Part 3, Division 5 of the Forest Act which grants the rights to harvest timber. A TFL has a term of 25 years and requires a management plan providing for the establishment, management and harvesting of timber in a described area (Crown and private land) on a sustained or perpetual yield basis.

Timber supply area (TSA) -- An integrated resource management unit established in accordance with Section 6 of the *Forest Act*. TSAs were originally defined by an established pattern of wood flow from management units to the primary timber-using industries. They are the primary unit for allocable annual cut determination. There are seven TSAs in the Kootenay region.

Utilization standards -- Standards that are prescribed by the Ministry of Forests respecting the size and quality of trees that must be removed from a logging site, and conversely those trees or portions of trees that may be left behind due to marginal small size or-soundness of the wood.

Value-added -- The creation of additional value / income to a resource or product through the further processing, refinement or manufacturing of that resource or product.

Viability -- A statistically or qualitatively generated measure describing a population's persistence or probability to avoid local extirpation as a deterministic environmental variation, and catastrophic genetic drift. Viability is evaluated using three key factors:

- effect of various chance events on population persistence
- time frame used in population planning
- degree of security sought for the population being conserved.

Natural limits to population viability are:

- demographic uncertainty (random events in the survival and reproduction in individuals)

- environmental uncertainty due to random changes in weather, food supply, competitors, predators, parasites, etc.
- natural catastrophes such as floods, fires, droughts
- genetic uncertainty due to random changes in genetic make-up due to founder effect, drift, inbreeding.

Wildlife habitat area -- Defined in the *Forest Practices Code of British Columbia Act*, Operational Planning Regulation, as a mapped area of land that the Deputy Minister of Environment, Lands and Parks, or a person authorized by that deputy minister, and the chief forester, have determined is necessary to meet the habitat requirements of one or more species of identified wildlife.

Wildlife tree -- Defined in the *Forest Practices Code of British Columbia Act*, Operational Planning Regulation, as a tree or group of trees that are identified in an operational plan to provide present or future wildlife habitat. A wildlife tree is a standing live or dead tree with special characteristics that provide valuable habitat for the conservation or enhancement of wildlife (e.g., large diameter and height, current use by wildlife, declining or dead condition, value as a species, or valuable location and relative scarcity).

Woodlot license -- An agreement entered into under Section 41 of the *Forest Ac t* which grants the rights to harvest timber on a small parcel of Crown and private land (less than 400 hectares on the Coast or 600 hectares in the Interior).

Yellow-listed species – Vertebrates that are considered “not at risk” within the province, as determined by the Committee on the Status of Endangered Species in Canada (COSEWIC). The Ministry of Environment, Lands and Parks ELP designates some yellow-listed species as “regionally important” because their habitat requirements are not met by other provisions of the Forest Practices Code.