# Table of Contents

1.0 INTRODUCTION .......................................................................................................................... 1

1.1 PURPOSE ...................................................................................................................................... 1
1.2 LOCATIONS AND DESCRIPTION OF THE TFL ................................................................. 1
1.3 HISTORY ....................................................................................................................................... 1
1.4 LICENSE HOLDERS AND ADMINISTRATION ........................................................................... 2
1.5 RESOURCE ISSUES ..................................................................................................................... 4

2.0 RESOURCE INVENTORIES ........................................................................................................... 7

2.1 GENERAL ..................................................................................................................................... 7
2.2 TIMBER ......................................................................................................................................... 8
   2.2.1 Forest Cover .......................................................................................................................... 8
   2.2.2 Operable Cut Line ............................................................................................................... 10
   2.2.3 Total Chance Inventory ..................................................................................................... 12
   2.2.4 Operational Inventory ...................................................................................................... 13
   2.2.5 Growth & Yield .................................................................................................................. 13
2.3 TERRAIN STABILITY .................................................................................................................. 13
2.4 RECREATION .............................................................................................................................. 14
   2.4.1 Recreation Features Inventory and Recreation Opportunities Spectrum .................... 14
   2.4.2 Visual Landscape Inventory ............................................................................................. 17
2.5 WILDLIFE AND FISH ................................................................................................................. 18
   2.5.1 Stream and Wetland Classification ............................................................................... 18
   2.5.2 Wildlife ............................................................................................................................ 18
2.6 AVALANCHE .................................................................................................................................. 19
2.7 ARCHAEOLOGICAL .................................................................................................................... 19
2.8 BIOGEOCLIMATIC ECOSYSTEM CLASSIFICATION .............................................................. 20
2.9 WATERTHEDS .......................................................................................................................... 22
2.10 MINING ...................................................................................................................................... 24

3.0 MANAGEMENT OBJECTIVES ...................................................................................................... 25

3.1 MANAGEMENT AND UTILIZATION OF THE TIMBER RESOURCE ......................................... 25
3.2 PROTECTION AND CONSERVATION OF NON TIMBER VALUES ........................................... 26
3.3 INTEGRATION OF HARVESTING WITH NON-TIMBER USES .................................................. 26
3.4 FOREST HEALTH AND FOREST PROTECTION ....................................................................... 26
3.5 SILVICULTURE ........................................................................................................................... 26
3.6 ROADS ......................................................................................................................................... 27
3.7 OTHER ......................................................................................................................................... 27

4.0 PLANNING ................................................................................................................................. 28

4.1 GENERAL ...................................................................................................................................... 28
   4.2.1 Kootenay-Boundary Land Use Plan ................................................................................ 30
   4.2.2 Revelstoke Higher Level Plan Order ............................................................................. 31
   4.2.3 SarCO Caribou Management ......................................................................................... 31
   4.2.4 Timber Supply Analysis ................................................................................................. 32
   4.2.5 20-Year Plan ................................................................................................................... 35
   4.2.6 Local Resource Use Plans .............................................................................................. 35
4.3 OPERATIONAL PLANS ................................................................................................................. 36
   4.3.1 Forest Stewardship Plans ............................................................................................... 36
   4.3.2 Other Plans, Prescriptions and Permits ....................................................................... 36

5.0 TIMBER RESOURCE MANAGEMENT ......................................................................................... 38
5.1 ANNUAL ALLOWABLE CUT (AAC) ............................................................................................................ 38
5.2 HARVESTING ........................................................................................................................................... 39
  5.2.1 Harvesting Priorities and Guidelines .............................................................................................. 39
  5.2.2 Harvesting Systems .......................................................................................................................... 40
  5.2.3 Silvicultural Systems ....................................................................................................................... 45
  5.2.4 Utilization Standards ....................................................................................................................... 48
5.3 FOREST ROAD SYSTEMS ..................................................................................................................... 48
  5.3.1 Road System Planning and Development ......................................................................................... 48
  5.3.2 Maintenance ..................................................................................................................................... 52
  5.3.3 Deactivation ..................................................................................................................................... 52
  5.3.4 Access Management ....................................................................................................................... 52
5.4 SILVICULTURE ......................................................................................................................................... 53
  5.4.1 Basic Silviculture ............................................................................................................................ 54
  5.4.2 Enhanced Silviculture ...................................................................................................................... 59
5.5 FOREST HEALTH ..................................................................................................................................... 61
  5.5.1 Non Recoverable Losses ................................................................................................................ 62
5.6 FIRE PROTECTION ................................................................................................................................... 63
  5.6.1 Prevention ......................................................................................................................................... 63
  5.6.2 Fire Pre-Organizational Plan ......................................................................................................... 63
  5.6.3 Fire Detection ................................................................................................................................... 63
6.0 NON-TIMBER RESOURCE MANAGEMENT ......................................................................................... 64
  6.1 RANGE .................................................................................................................................................. 64
  6.2 RECREATION ....................................................................................................................................... 64
  6.3 VISUAL ................................................................................................................................................ 67
  6.4 AQUATIC RESOURCES ...................................................................................................................... 69
  6.5 WILDLIFE AND BIOLOGICAL DIVERSITY ....................................................................................... 70
7.0 CONSULTATION WITH THE PUBLIC AND OTHER RESOURCE USERS ........................................... 72
  7.1 NON-TIMBER TENURE HOLDERS ........................................................................................................ 72
  7.2 FIRST NATIONS ................................................................................................................................... 72
  7.3 PUBLIC REVIEW .................................................................................................................................. 73
8.0 IMPACT SUMMARY OF MP IMPLEMENTATION ................................................................................ 74
9.0 EMPLOYMENT AND ECONOMIC OPPORTUNITIES ......................................................................... 75
10.0 COMPARISON OF CURRENT AND PROPOSED MP ........................................................................ 77
11.0 ANNUAL REPORT .................................................................................................................................. 79
**List of Figures**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Location Map for TFL 56</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>The Community of Revelstoke</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Mountain Caribou</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>1:20,000 Scale Mapsheet Key</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>1994 and 1999 Operable Cut Lines at Pass Creek</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Operable Cut Line for TFL 56</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>Excerpt From Total Chance Harvest Plan</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>Hiking in the Keystone Area</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>Cross-Country Skiing in the Upper Downie Valley</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>Designated Recreation Sites</td>
<td>16</td>
</tr>
<tr>
<td>11</td>
<td>Digital Modelling and Actual Post Harvest View from CMH Adamants Lodge</td>
<td>17</td>
</tr>
<tr>
<td>12</td>
<td>Reserved Old Growth Stand in the Downie Valley</td>
<td>18</td>
</tr>
<tr>
<td>13</td>
<td>Avalanche in the Downie Valley</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>Biogeoclimatic zones</td>
<td>21</td>
</tr>
<tr>
<td>15</td>
<td>Approximate Water Licence Locations in TFL 56</td>
<td>23</td>
</tr>
<tr>
<td>16</td>
<td>Mining Operations in The Goldstream Valley</td>
<td>24</td>
</tr>
<tr>
<td>17</td>
<td>Management Zones in TFL 56 -- Caribou</td>
<td>29</td>
</tr>
<tr>
<td>18</td>
<td>Management Zones in TFL 56 -- Biodiversity</td>
<td>30</td>
</tr>
<tr>
<td>19</td>
<td>The Base Case scenario for MP4 with the MP3 Base Case referenced.</td>
<td>34</td>
</tr>
<tr>
<td>20</td>
<td>Ground-Skid Harvesting</td>
<td>40</td>
</tr>
<tr>
<td>21</td>
<td>Cable Harvesting</td>
<td>41</td>
</tr>
<tr>
<td>22</td>
<td>Helicopter Harvesting</td>
<td>42</td>
</tr>
<tr>
<td>23</td>
<td>Skyline Harvesting</td>
<td>43</td>
</tr>
<tr>
<td>24</td>
<td>Harvest Systems In Use In TFL 56</td>
<td>44</td>
</tr>
<tr>
<td>25</td>
<td>Silviculture Systems In Use In TFL 56</td>
<td>45</td>
</tr>
<tr>
<td>26</td>
<td>Group Selection Silviculture System in the Keystone Area</td>
<td>46</td>
</tr>
<tr>
<td>27</td>
<td>Single Tree Selection Silviculture System Near Cap Creek</td>
<td>46</td>
</tr>
<tr>
<td>28</td>
<td>Shelterwood Silviculture System</td>
<td>47</td>
</tr>
<tr>
<td>29</td>
<td>Commercial Thinning</td>
<td>47</td>
</tr>
<tr>
<td>30</td>
<td>Present and Projected Road System In TFL 56</td>
<td>50</td>
</tr>
<tr>
<td>31</td>
<td>End-Haul Construction at Brewster Valley</td>
<td>51</td>
</tr>
<tr>
<td>32</td>
<td>Helicopter Skiing</td>
<td>65</td>
</tr>
<tr>
<td>33</td>
<td>Keystone Cabin</td>
<td>67</td>
</tr>
<tr>
<td>34</td>
<td>Typical Scene in TFL 56</td>
<td>68</td>
</tr>
<tr>
<td>35</td>
<td>RCFC Log Yard</td>
<td>75</td>
</tr>
</tbody>
</table>
List of Tables

Table 1  Forest Resource Inventories................................................................. 7
Table 2  Avalanche Risk Assessments............................................................... 19
Table 3  Biogeoclimatic Subzone and Variant Occurrence.............................. 20
Table 4  Water Licenses on TFL 56 (current to March 28, 2008)....................... 22
Table 5  Land Base Net-down Summary........................................................... 33
Table 6  Silviculture Systems in use in TFL 56.................................................. 48
Table 7  Typical Log Hauls to Revelstoke Mills.............................................. 51
Table 8  Tree Seed Inventory (February 2008).................................................. 56
Table 9  Use of Class “A” Genetically Improved Seed...................................... 57
Table 10 Commercial Pests and Diseases of TFL 56......................................... 61
Table 11 Commercial Recreation Activities on TFL 56...................................... 64
Table 12 Non-Commercial Recreation Activities on TFL 56............................ 65
Table 13 Forest Service Recreation Sites Within or Near TFL 56....................... 66
Table 14 Commercial or Provincial Parks or Campgrounds Within or Near TFL 56. 67
Table 15 Visual Management Guidelines from Applicable Plans..................... 69
Table 16 Recommended Distribution of Patch Sizes (Harvest Units and Leave Areas) .... 71
Table 17 Direct Employment In TFL 56............................................................ 75
Table 18 Secondary Employment In TFL 56...................................................... 76
Table 19 Comparison of Timber Supply Modeling In the Current and Proposed MP...... 77
## List of Appendices

| Appendix 1 | Revelation Community Forest Corporation Management Plan #4 – Information Package |
| Appendix 2 | Recreation Inventory |
| Appendix 3 | Listed Endangered Species |
| Appendix 4 | a) Revelation Higher Level Plan Order  
               b) Ungulate Winter Range #U-3-005 Mountain Caribou – Revelation Shuswap Planning Unit |
| Appendix 5 | Referral List a) Deputy Chief Forester Letter and Advertisements  
               b) i. First Nations Referral List  
              ii. First Nations Referral Letters  
               c) Stakeholder Referral Letters |
| Appendix 6 | TFL 56 Document |
| Appendix 7 | History of TFL 56 |
| Appendix 8 | TFL AAC Focused Investment Planning Guide |
| Appendix 9 | Memorandum a) Non-Recoverable Losses  
              b) Regeneration Assumptions  
              c) Pulp Harvest History |
| Appendix 10 | Revelation Community Forest Corporation Management Plan #4 – Analysis Report |
| Appendix 11 | Communications on Draft Management Plan #4 |
1.0 Introduction

1.1 Purpose

The purpose of Management Plan #4 (MP #4) is to identify and propose for approval by the Chief Forester, the management objectives and strategies for achieving those objectives, for the timber and non-timber resources within the Tree Farm License. The MP is a strategic five-year plan. Operations conducted under the Tree Farm License must be consistent with the objectives and strategies stated in the plan.

1.2 Locations and Description of the TFL

Situated 40 kilometers north of Revelstoke, TFL 56 covers an area of approximately 119,820 hectares. It is bounded on the west by the Lake Revelstoke reservoir, on the east by the height-of-land of the Selkirk Mountains, on the north by the Goldstream River and on the south by the Downie-Carnes height-of-land.

The land is extremely rugged and dominated by two roughly east-west valleys – those of Downie Creek and Goldstream River – and one north-south valley, that of the Columbia River (Lake Revelstoke Reservoir). Elevation ranges from 573 metres at reservoir level to 3050 meters at Carnes Peak.

The forested land base is a relatively small proportion of total area and the timber harvesting land base is even a smaller proportion still. Most harvesting is confined to valley sidewalls and valley bottoms. The remaining “high country” is too rugged or does not support marketable timber.

The ruggedness has minimized human use, hence there are no settlements, little private land, and until recently little recreation use. One highway (Hwy 23N) traverses the TFL. Traffic is light and dominated by logging and other industrial traffic.

Wildlife utilize the TFL area extensively. Grizzly bears, black bears, moose, deer, and caribou are common. Caribou have become a management issue because they have been extirpated over much of their former range.

1.3 History

From 1955 to 1992, the license area was part of a much larger Tree Farm License (TFL 23). In 1992, the southern portion of TFL 23 (south of Revelstoke) was sold to Pope and Talbot Ltd. while the northern portion (including what are now TFL’s 55 and 56) was retained by Westar Timber. In late 1992, Westar Timber negotiated a sale of the northern portion of the TFL to Evan’s Forest Products Ltd. Due in large part to concerns identified by citizens of Revelstoke, the sale was disallowed and a revised deal negotiated. This revised deal -- reached in early 1993 -- saw the northern portion of what was once TFL 23 split into TFL’s 55 and 56. TFL 55 was sold to Evans Forest Products and TFL 56 to the City of Revelstoke.

The first Management Plan that TFL 56 operated under was Management and Working Plan #7 for TFL 23. This was followed by MP #2 (approved in 1996), and MP #3
Management Plan #2 was the first MP devised solely for TFL 56. Management Plan #3 was devised using a spatial planning model – one of the first operational uses of such a model in the province. Management Plan #4 was devised using Patchworks™, a fully spatial forest estate model that can incorporate real world operational considerations into a strategic planning framework. MP #3 will expire in May 2009.

1.4 License Holders and Administration

The Revelstoke Community Forest Corporation (RCFC) was formed in April 1993 to manage and operate Tree Farm License (TFL) 56 that was purchased from Westar Timber Ltd. The corporation is wholly owned by the RCFC Holding Company Ltd., which in turn is wholly owned by the City of Revelstoke. Three local industry partners helped finance the original purchase.

The city holds 100% of the shares in the Holding Company while the industry partners purchased timber removal rights to a portion of the license's Allowable Annual Cut (AAC). The City's sawlog allocation (50% of the AAC) is sold through a log sort yard, primarily on a competitive bid basis or on a direct negotiated arrangement. The industry partners' sawlog volumes are provided at cost (averaged annually) with species and grades representative of the profile harvested. Pulpwood is sold under separate contract with the proceeds being factored back into the cost of logs.

Previously, the corporation was wholly owned by the City of Revelstoke. In January 2000, corporate restructuring took place – the RCFC Holding Company was placed in complete ownership of the corporation. This was done for various reasons and with the advise of our lawyers and accountants.

RCFC Holding Company Ltd. and RCFC are governed by seven member Boards of Directors composed of the Mayor, two City Councilors, the City Administrator and three appointees from the community. A staff of five employees manages the day-to-day business. The industry partners have input through a management advisory committee. All forest management, construction, logging and silviculture activities are contracted out. The goal is to maximize local employment and economic benefit in the community. The Corporation is funded through the proceeds of log sales. During the community referendum, which was held to ratify purchasing the TFL, a commitment was made that tax payers would not be called upon to fund the venture.

TFL 56 lies within the Columbia Forest District. The Ministry of Forest and Range, District Office is in Revelstoke.

The AAC for TFL 56 in MP #3 was 100,000 m³ annually, of which 11,480 m³ was apportioned to the BC Timber Sales program. RCFC has requested a decrease in the AAC for TFL 56 to 88,000 m³ annually. The details of the AAC Analysis Report is presented in Appendix 10 (MP4 Timber Supply Analysis Report) and awaits the BC Chief Forester to make his AAC determination for the TFL.
Figure 1. Location Map for TFL 56.
1.5 Resource Issues

During the previous Management Plan process (MP #3), a number of issues that RCFC faced were presented. These issues, although dealt with in MP #3, still exist as significant issues in MP #4. These issues are discussed below.

**Pulp Log markets:** Markets and prices for pulp logs continue to be problematic. RCFC’s timber supply has a high proportion of pulp logs – typically 35% to 40% of the volume harvested annually.

**Revelstoke Higher Level Plan:** The Revelstoke Minister’s Advisory Committee spent several years formulating a land use plan for the Revelstoke area, including TFL 56. The report was entitled *Revelstoke and Area Land Use Planning Final Recommendations* dated October 1999 and was endorsed by government in April 2001 as the Revelstoke Higher Level Plan Order. This Order has established Resource Management Zones, their objectives, and monitoring and review of the Order. It has set out resource management zone objectives and habitat requirements for biodiversity, old and mature forests and grizzly bears. These requirements have been implemented into the base case of the Timber Supply Analysis Report.
Caribou Habitat Management: Mountain caribou (Figure 3) utilize a large proportion of the TFL area. The issue has revolved around harvesting and caribou habitat interactions.

In May 2002, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated woodland caribou (including the mountain ecotype) within the Southern Mountain Population as “threatened”. Under the federal Species at Risk Act (SARA), the BC Government was responsible to prepare a Recovery Plan that would provide direction in the recovery of the mountain caribou. The Species at Risk Coordination Office (SaRCO) designated the Revelstoke Habitat Team to developed a recovery plan which took effect in December 2008.

The Recovery Plan for the region was to protect an additional 10,000 hectares of incremental caribou habitat from harvesting within the Timber Harvest Land Base (THLB). Local herd biologists chose areas that were best suited for caribou habitat and set the target recovery population of the herd to pre 1996 numbers. This incremental habitat was additional to the status quo habitat set by the MAC planning process that were accepted and endorsed by government in April 2001 as the Higher Level Plan Order. A Government Action Regulation (GAR) Order has been developed to spatially define status quo and incremental habitat. The order was signed by government December 18, 2008. The status quo and incremental habitat have been incorporated into this timber supply analysis.

Harvesting Costs: Harvesting costs have increased dramatically in the last decade. The main reasons for this include: stumpage increases, and harvesting in higher cost locations. In the case of TFL 56, the most significant reason either is the fact that the lower-cost operating areas are already harvested or forest cover constraints prevent harvesting. The high harvesting costs are mostly associated with the rugged Selkirk Mountain topography within TFL 56.
Species Profile: The forest cover on TFL 56 is dominated by older forests with a high proportion of low value timber. The current proportions, by volume of leading species are: cedar 31%, spruce 31%, hemlock 24%, Douglas-fir 9%, and subalpine fir 5%. RCFC must harvest this profile and remain profitable.

BC Timber Sales (BCTS): In Management Plan #3, BCTS had the right to harvest timber at a non-declining rate of 11,480m³ per year when the cut was 100,000m³ which comprised 11.5% of the AAC. With the proposed decrease in Management Plan #4 to 88,000m³, BCTS would have over 13% of the AAC. RCFC will still have to pay all of the fixed costs of managing the TFL on a much smaller AAC that is further aggravated by the non-declining BCTS apportionment.

Wood Quality for the Future: Currently, RCFC is harvesting older forests. The trees in these forests, although often partially decayed, have a higher proportion of wood that is fine-grained and clear than do second-growth forests. At issue is the quantity of harvestable high-quality wood in the future for the many end products produced from TFL 56 forests. These issues will be addressed in the text of this plan.
2.0 Resource Inventories

2.1 General

The Forest Act states, “inventory of the forest, recreation, fisheries, wildlife, range and cultural heritage resources on the tree farm licence area is the responsibility of the TFL holder”. These inventories meet the specifications required under the tree farm license and are based on the best information readily available to RCFC.

RCFC has carried out or maintained existing inventories of timber, recreation, and cultural resources. RCFC also required other information to adequately manage the TFL area -- a number of other activities that may be loosely defined as “inventories” have been completed. The following table lists all the inventories that have been completed, date completed, approval status, standards used, and other information. Where further explanation is warranted, the following sections of MP # 4 will provide it.

Table 1. Forest Resource Inventories.

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Date completed</th>
<th>Approval</th>
<th>Standard or Intensity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial Photography</td>
<td>July 1998</td>
<td>Approval not required</td>
<td>1:50,000 scale, B&amp;W.</td>
<td>1:50,000 aerial photography was completed on TFL 56.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This photography was digitally ortho-rectified to create 1:20,000 mapsheets. Essentially these are maps that look like photos and are invaluable planning and inventory tools. They exist digitally as a “layer” in RCFC’s digital base map and physically as mapsheets in our map cabinet.</td>
</tr>
<tr>
<td>Satellite Imaging</td>
<td>July 2004</td>
<td>Approval not required</td>
<td>2.5 metre panchromatic pixels, and 10 meter colour</td>
<td>Data has been used to produce new 1:20,000 orthophotos in panchromatic and false colour. Data exists as a layer in RCFC’s digital base map</td>
</tr>
<tr>
<td>Large Scale Contour Mapping</td>
<td>1997</td>
<td>Approval not required</td>
<td>1:5,000 scale, 5-metre contour interval.</td>
<td>Mapping at a 1:5,000 scale and at a 5 metre contour interval has been completed for timbered portions of the TFL.</td>
</tr>
<tr>
<td>Total Chance Inventory</td>
<td>November 1998</td>
<td>Approval not required</td>
<td>Completed using above-mentioned orthophotos and 5-metre contour mapping with field checks.</td>
<td>Total chance harvest planning has been carried out in the entire TFL. This essentially provides an inventory of all timber that is currently deemed “practical” to harvest and suggests methods for access and harvest.</td>
</tr>
<tr>
<td>Forest Cover</td>
<td>2002</td>
<td>2002 Ministry of Forests</td>
<td>Completed to Ministry of Forests standards.</td>
<td>VRI Phase 1 was completed May 14, 2002.</td>
</tr>
<tr>
<td>Terrain Stability</td>
<td>April 1997</td>
<td>Approval not required</td>
<td>Completed to Ministry of Forests standards.</td>
<td>Terrain stability (TSIL D) mapping was completed for the entire TFL.</td>
</tr>
</tbody>
</table>
### Recreation Inventory

<table>
<thead>
<tr>
<th>Recreation</th>
<th>New inventory completed Oct. 2000</th>
<th>Approved 2001</th>
<th>Completed to Ministry of Forests standards.</th>
<th>This has now been updated and digitized to current ministry standards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caribou habitat</td>
<td>February 1996</td>
<td>Approval not required.</td>
<td>Completed by professional biologist to accepted standards.</td>
<td>Caribou Habitat Suitability mapping has been completed for key areas of the TFL</td>
</tr>
<tr>
<td>Stream and Wetlands</td>
<td>February 1998</td>
<td>Approved February 1998 by Columbia Forest District.</td>
<td>Completed to Ministry of Forests standards.</td>
<td>Stream and wetland classification has been done for the entire TFL. The information used is field-based for most streams in the Downie Valley and Front Face areas of the TFL. Limited field data was available for the Goldstream area. However, fieldwork is being completed in 1999 for the Goldstream watershed.</td>
</tr>
<tr>
<td>Avalanche Likelihood</td>
<td>September 1998</td>
<td>Approval not required.</td>
<td>Completed by avalanche professionals</td>
<td>Avalanches have become an issue as harvesting progresses on steeper slopes, higher elevations, and further back in narrow valleys. This mapping has been completed for the entire TFL and provides avalanche hazard by polygon.</td>
</tr>
<tr>
<td>Cultural Heritage Resources</td>
<td>Ongoing</td>
<td>Individual inventories approved as completed.</td>
<td>Completed by professional archaeologists to accepted standards.</td>
<td>Cultural heritage inventories will be completed on a site-specific basis when specific concerns are brought forward or if any signs of cultural heritage resources are noted during the other on-site assessments that take place. RCFC has to-date completed three archaeological impact assessments where concerns were noted during the Forest Development Plan process. No archaeological sites were discovered.</td>
</tr>
</tbody>
</table>

### 2.2 Timber

#### 2.2.1 Forest Cover

A new Phase 1 Vegetation Resources Inventory (VRI) was completed in March 2002 using 1997 photos. This was completed to Resources Inventory Branch Specifications and approved by the Ministry of Forests in 2002. This file has been updated for disturbances to January 2008 using RCFC data for logged areas.

Figure 4 illustrates our VRI base maps.
Figure 4. 1:20,000 Scale Mapsheet Key
2.2.2 Operable Cut Line

An operable cut line (OCL) that estimates the limits of productive forest suitable for harvest was first established in 1974. Areas that were not considered harvestable by existing logging methods or that were considered inaccessible were discounted from the timber harvesting landbase. A revision to the OCL line was completed in 1991. This OCL line discounted pulpwood stands as inoperable. In 1994, the OCL was revisited and revised to include many pulpwood stands previously discounted. The 1994 line was the basis for MP #2. In 1999, the OCL line was again determined. This 1999 line encompasses more low quality timber and extends into areas that were previously considered inoperable. It is based upon RCFC’s harvesting history during the MP #2 period.

In 2008, the OCL was refined further given updated knowledge of the area and harvesting practices over the last eight years. This revised line has been incorporated into MP#4.

Figure 5 shows an example of the 1994, 1998 and 2008 lines. During the term of MP #4, RCFC will continue to monitor the accuracy of the 2008 OCL and revise it if necessary for MP #5.

Figure 5. 1994, 1999, and 2008 Operable Cut Lines at Pass Creek
Figure 6. Operable Cut Line for TFL 56.
2.2.3 Total Chance Inventory

The Total Chance Harvesting Plan (TCHP) was completed by Grant Sime R.P.F. of Silvatech Forestry Consultants using a Wilde stereo-plotter with 1994, 1:15,000 aerial photography, and 1:5,000 five-meter interval contour mapping as a base map. The plan looked at all harvesting opportunities on the forested land base without regard to the 1994 operability line. This work was fine-tuned with 1994 forest cover mapping, "Level D" terrain hazard mapping, ESA mapping, Avalanche Hazard mapping, Slope Thematic mapping and field knowledge and experience.

In the TCHP, road systems for the entire TFL were projected based on existing roads and Ministry of Forest's engineering guidelines for grade control on new roads. Blocks were designed for a combination of ground skidding (slopes less than 30%) and cable yarding (30% to 80% slopes). Yarding distances on cable blocks were limited to 200 meters downhill and 300 meters uphill utilizing medium-sized (e.g. Madill 071) mobile yarders. Areas containing merchantable timber which were not suitable for road construction and conventional skidding or yarding were designated for helicopter logging. Generally, these areas were only considered if they were within 1500 meters of a suitable landing site with road access. Longline or skyline systems may be used instead of helicopters where deflection is suitable, but specific sites must be identified through detailed ground assessment and they were not distinguished in the TCHP. Block sizes were kept to maximum of 40 hectares although most are less than 15 hectares in size. A clearcutting system was anticipated in block design but many blocks are suited to small group selection where other values dictate a less intrusive harvesting system.

The aerial harvest areas in the total chance plan were reviewed and refined in 2008 given the operational knowledge of the TFL. These refined areas occupy approximately 8% of the Timber Harvest Land Base.

Figure 7. Excerpt From Total Chance Harvest Plan.
2.2.4 Operational Inventory

An operational level inventory of the timber resource (timber cruising) will be completed as part of every cutting permit application. Timber cruising is done in compliance with the applicable Ministry of Forests guidelines.

2.2.5 Growth & Yield

RCFC does not have its own growth and yield program, but does cooperate with the Ministry of Forests and Range on the provincial program.

RCFC has begun a program of collecting site index information at the time of Free Growing assessments. The growth intercept method is used and the relevant forest inventory electronic files are updated with the new information. The Timber Supply Information Package has a listing of all such updates completed to date. It is of interest to note that of 4731 hectares that have had the original site indices updated, the average site index has increased from 20.5 to 23.4 metres (at breast height age 50), a 14% increase. Details are shown in Appendix 1 of the Timber Supply Information Package. The information package is included in Appendix 1 of this Management Plan.

Where better site indexes were available, they were used to derive managed stand yields only. Where several options existed, they were prioritized as follows:

1. Growth intercept from regenerations surveys
2. SIBEC 2nd approximation estimates
3. SIBEC 1st approximation estimates
4. Forest Cover Inventory estimates

SIBEC adjustments were applied using the Revelstoke Predictive Ecosystem Mapping (PEM) project (Jones, C. et. Al., 2008) and SIBEC data supplied by the MFR Research Branch. Results from an interim accuracy assessment report (Timberline, 2008) of the PEM data indicate that when ESSF ecosystems are not considered, the PEM met minimum requirements for sample size and accuracy as set out by the Forest Analysis and Inventory Branch. Therefore, for the purpose of MP 4, the base case analysis will only include SIBEC adjustments to stands in the ICH ecosystems. RCFC plans to complete further PEM plots in the ESSF biogeoclimatic zone to increase accuracy and have the SIBEC adjustments useable in the future.

2.3 Terrain Stability

Terrain stability mapping to a “level D” standard was completed in April 1997 and has been an important part of forestry planning since completion. A report entitled TFL 56, Revelstoke Forest District, TSIL D Reconnaissance Landscape Hazards and a series of 1:20,000 map sheets were produced.

RCFC uses this information in forest level planning. When operational plans are prepared, further geotechnical investigations are completed under the following circumstances:
• TSIL “D” mapping indicates unstable or potentially unstable terrain, or
• Slopes are greater than 60%, or
• Fieldwork reveals signs of instability.

2.4 Recreation

2.4.1 Recreation Features Inventory and Recreation Opportunities Spectrum

Both recreation features inventory (RFI) and recreation Opportunity spectrum (ROS) classification have been completed on TFL 56. The Recreation Inventory was updated in November 2000 and approved in 2001 (see Appendix 2).

The RFI provides information about recreation features to land use planners and resource managers to assist them in making decisions on appropriate land uses, resource development objectives and management prescriptions. The inventory may be used as input to higher level plans, provincial initiatives, or operational plans.

Figure 8. Hiking in the Keystone Area.
The ROS classification system is largely a function of an area’s distance from a road. TFL 56 lies in very mountainous terrain with a series of valleys through it. Since these valleys are mostly roaded and the valleys are not far apart, the vast majority of the landscape falls within the Semi-Primitive Non-Motorized ROS class (areas more than 1 km but less then 8 km from a road). Most of the remainder (small areas adjacent to and <1 km from roads) falls within the Roaded Modified (RM) class. There are no Primitive or Roaded Natural areas, and one small area of Semi-Primitive Motorized (SPM).

Figure 9. Cross-Country Skiing in the Upper Downie Valley.
Figure 10. Designated Recreation Sites, Heli-ski Runs and Backcountry Lodges.
2.4.2 Visual Landscape Inventory

A visual landscape inventory has not been required in TFL 56 because the area has not been designated as a scenic area. However, RCFC does recognize the importance of the visual resource and the visual sensitivity of steep mountainsides in the Columbia Mountains.

RCFC may undertake visual landscape planning in specific localities identified in the operational level plans. See Section 6.3 for further visual plan strategies.

Figure 11. Digital Modelling of a Proposed Harvest Plan (top) and actual post harvest view from the CMH Adamants Lodge of Cutting Permit 320.
2.5 Wildlife and Fish

2.5.1 Stream and Wetland Classification
The streams, wetlands, and lakes of TFL 56 support resident fish species including rainbow trout, bull trout, kokanee, mountain whitefish, and others. Recreational fishers heavily use Lake Revelstoke, a hydroelectric reservoir along the western TFL boundary. The two major streams in the TFL, Downie Creek and Goldstream River, are fished less but still support populations of game fish and other species. Many tributaries of these streams, and other feeder streams of Lake Revelstoke, support fish populations.

Stream and wetland classification has been completed for the entire TFL. Intensive on-site sampling of the Downie, and to a lesser extent the Goldstream watersheds, has taken place. However, all streams and wetlands have not been visited due to inaccessibility or minor nature of the features. These have been classified from maps or aerial photos.

Field classification of these streams will be gradually completed as RCFC does forestry fieldwork adjacent to map-classified streams and wetlands.

Further information is available in the report entitled Stream, Wetland and Lake Classification Data for Tree Farm Licence #56 dated February 6, 1998.

![Reserved Old-growth stand in Downie Valley.](image)

2.5.2 Wildlife
While many species of wildlife exist in TFL 56, few have been inventoried. Caribou have been extensively studied, radio-collared, and counted. As well, RCFC has completed habitat suitability mapping on portions of the TFL to aid in forest planning. Research, funded by RCFC’s Forest Renewal BC budget and other sources, has taking place on bats (northern long-eared myotis), Coeur d’Alene salamanders, Western toad and Northern goshawks.
A list of red and blue listed species that occur in the Revelstoke area is included in Appendix 3.

Hunting occurs throughout TFL 56 for a variety of species (black bear, grizzly bear, moose, deer, cougar, mountain goat) and is governed by BC hunting regulations.

2.6 Avalanche

RCFC operates in some of the most avalanche prone forestland in the world. The first step in managing forestland to reduce the potential of destructive avalanches is to identify where the hazards are. RCFC commissioned an inventory of avalanche likelihood to aid in both forest level and stand level planning.

Further field assessments are carried out on higher risk areas as indicated in the following table. A Qualified Registered Professional will assess any areas above Highway 23N of high or very high risk on the Avalanche Likelihood Map.

<table>
<thead>
<tr>
<th>Cut Block Characteristics</th>
<th>Type of Assessment</th>
<th>Qualifications of Assessor</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Negligible”, “low” or “moderate” risk on Likelihood Map</td>
<td>No further assessment unless prescribing forester feels that one is necessary</td>
<td>Canadian Avalanche Association level 2 certified individual for difficult situations, otherwise R.P.F. with at least two years of experience in the Columbia Mountains</td>
</tr>
<tr>
<td>“High” or “very high” on Likelihood Map</td>
<td>On-site assessment at time of SP fieldwork</td>
<td></td>
</tr>
</tbody>
</table>

Figure 13. Avalanche in the Downie Valley.
2.7 Archaeological

First nations groups did not use the TFL area heavily. The river served as a transportation corridor and was likely the most heavily used area near or within the TFL. The flooding of the Revelstoke Dam pondage obliterated any archaeological sites that may have existed near the river. There are no known archaeological sites associated with First Nations elsewhere in the TFL area.

Also of historical concern are the activities of early settlers and miners. A placer mine operated in the Goldstream Valley near the confluence of French Creek and Goldstream River during and after the gold rush of the 1860’s. Associated workings exist on McCullock Creek and it is likely that early miners sampled other areas nearby. This activity took place in the 1860’s. These sites are just north of TFL 56 on neighbouring TFL 55. No known archaeological sites associated with early miner or settler activity occur in TFL 56.

Archaeological overview assessments have not been carried out in the TFL area. In lieu of these, sites most likely to have been used historically are identified at the FSP stage in cooperation with First Nations groups. Qualified archaeologists then carry out archaeological impact assessments. To date, RCFC has carried out 14 AIA’s on the TFL with no archaeological evidence unearthed.

RCFC will continue to cooperate with first nations and other groups in identifying potential archaeological sites and carrying out archaeological impact assessments.

2.8 Biogeoclimatic Ecosystem Classification

The biogeoclimatic subzones and variants that occur in TFL 56 are listed in Table 3 and illustrated in Figure 14. For the most part, TFL 56 is in the wetter portion of the interior wet belt – this is reflected in the biogeoclimatic subzones that occur. Complete descriptions of these subzones can be found in A Field Guide for Site Identification and Interpretation in Nelson Forest Region.

Table 3. Biogeoclimatic Subzone and Variant Occurrence.

<table>
<thead>
<tr>
<th>Climatic Region</th>
<th>Biogeoclimatic Subzone and Variant</th>
<th>Description</th>
<th>Proportion of entire TFL</th>
<th>Proportion of operable landbase in TFL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moist</td>
<td>ICHmw3</td>
<td>Thompson Moist Warm Interior Cedar - Hemlock Variant</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Wet</td>
<td>ICHwk1</td>
<td>Wells Gray Wet Cool Interior Cedar-Hemlock Variant</td>
<td>11%</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>ICHvk1</td>
<td>Mica Very Wet Cool Interior Cedar-Hemlock Variant</td>
<td>22%</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>ESSFvc</td>
<td>Very Wet Cold Englemann Spruce Subalpine - Fir Variant</td>
<td>38%</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>ESSFvcp</td>
<td>Very Wet Cold Parkland Englemann Spruce Subalpine - Fir Variant</td>
<td>18%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>AT</td>
<td>Alpine Tundra</td>
<td>9%</td>
<td>0%</td>
</tr>
</tbody>
</table>
RCFC has used the most current Ministry of Forests line work to delineate the occurrences of these subzones and variants. In the Goldstream Valley, silviculture prescription fieldwork was used to refine the boundary between the ESSFvc and the ICH subzones.

Figure 14. Biogeoclimatic variants present in TFL 56.
2.9 Watersheds

There are several domestic and commercial water use licenses on TFL 56, but there are no community watersheds. Licensed water users are listed in Table 4 and approximate locations are shown in Figure 15.

Table 4. Water Licenses on TFL 56 (current to March 28, 2008).

<table>
<thead>
<tr>
<th>Licence No.</th>
<th>Stream Name</th>
<th>Purpose</th>
<th>Map-sheet</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>C065949</td>
<td>Clydesdale Creek</td>
<td>Domestic and Irrigation</td>
<td>82M039</td>
<td>Water supply for district lot 3414 near Mars Creek</td>
</tr>
<tr>
<td>C033893</td>
<td>Roylance Creek</td>
<td>Waterworks (other)</td>
<td>82M048</td>
<td>Water supply for Downie resort</td>
</tr>
<tr>
<td>C120418</td>
<td>Caribou Creek</td>
<td>Domestic and Power-Residential</td>
<td>82M048</td>
<td>Water and power for guide outfitting cabin</td>
</tr>
<tr>
<td>Z123644</td>
<td>Granite Creek</td>
<td>Power-General</td>
<td>82M059</td>
<td>Proposed Micro-hydro project. Active appl.</td>
</tr>
<tr>
<td>C045933</td>
<td>Old Goldstream Creek</td>
<td>Enterprise</td>
<td>82M068</td>
<td>Water supply for highways camp</td>
</tr>
<tr>
<td>C045933</td>
<td>Angelico Creek</td>
<td>Enterprise</td>
<td>82M068</td>
<td>Water supply for highways camp</td>
</tr>
<tr>
<td>C112200</td>
<td>Brewster Creek</td>
<td>Enterprise</td>
<td>82M068</td>
<td>Water supply for Canadian Mountain Holidays Gothics Lodge</td>
</tr>
<tr>
<td>C115245</td>
<td>Hopwood Creek</td>
<td>Work Camp, Mining, and Processing Ore</td>
<td>82M068</td>
<td>Water supply for mining camp and mine works</td>
</tr>
<tr>
<td>Z121488</td>
<td>Goldstream River</td>
<td>Power-General</td>
<td>?</td>
<td>Active Appl.-Technical Assessment</td>
</tr>
<tr>
<td>Z123578</td>
<td>Goldstream River</td>
<td>Power-General</td>
<td>?</td>
<td>Active Appl.- Applic. Cleared</td>
</tr>
<tr>
<td>C118350</td>
<td>Goldstream River</td>
<td>Mining, and Processing Ore</td>
<td>82M068</td>
<td>Water supply for Goldstream mine at 13 km on the Goldstream FSR</td>
</tr>
</tbody>
</table>

RCFC will continue to review annually changes to the existence of licensed water users on or adjacent to the Tree Farm License area.
Figure 15. Approximate Water Licence Locations in TFL 56.
2.10 Mining

Mining has been occurring on what is now TFL 56 since the mid 1800’s. Trails into the Keystone were developed to “rawhide” ore from hard rock mines out to the river for transportation to smelters. Placer mining was occurring in the Goldstream area. Until recently, the Bethlehem mine in the Goldstream valley has been active. However, there are no active mines at present in the TFL 56 area.

There has been a number of concentrated areas of mineral exploration. In the Downie valley, near the junction with Sorcerer Creek, exploratory drilling has occurred with a number of trails built. The back of the Sorcerer Creek drainage has seen some trail building as well. The Brewster Creek valley has seen an increase in exploration activity in addition to the upper Devil’s Garden Road area and the lower Key Road area. There are many valid mineral claims that do generate significant exploration expenditures annually.

Figure 16. Mining Operations in The Goldstream Valley.
3.0 Management Objectives

Revelstoke Community Forest Corporation first outlined management objectives for Management Plan #3 in the “SMOOP” document in October 1999. No public or government agency comment was received specifically addressing the management objectives. RCFC has modified some of these somewhat while still being consistent with the SMOOP document.

3.1 Management and Utilization of the Timber Resource

Objectives for the management and utilization of the forest resource are:

- Manage the license area according to environmentally sound integrated resource use principles and land-use plans within the context of government regulations and guidelines.

- Harvest the various forest types in proportion to their relative abundance within the operable land base. This is sometimes referred to as “harvesting the profile”

- Use forest management and harvest planning strategies that will sustain the long term productivity of the working forest while minimizing impact on non-timber resources including fish, wildlife, recreation, biological diversity, wilderness and water.

- Use harvest methods that best suit the on-site conditions and that allow access to all areas of the timber harvesting landbase.

- Maximize conifer timber utilization.

- Explore utilization of the deciduous timber resource.

- Manage the forest in a manner that will produce a continuous flow of logs of suitable quality and quantity while maintaining other resource management goals.

- Recommend an annual allowable cut (AAC) which reflects the timber producing capacity of the landbase, the needs of non-timber resource users, and the social and economic values related to TFL 56.

- Cooperate with the Timber Sales Manager in the sale of BC Timber Sales timber licenses within the TFL, explore the possibility of defining a fixed area for BCTS to permanently operate in, and encourage the use of the same standards for calculation of harvest volumes (see section 1.5, Resource Issues).
3.2 Protection and Conservation of Non Timber Values

Objectives for protection and conservation of non-timber volumes are:

- Continue to use visual landscape planning principles and design in harvest planning and to coordinate visual landscape planning with other non-timber resource users.
- Minimize the effect of forestry activities on water quality, quantity, and flow timing.
- Ensure highway safety along the Highway 23 North corridor.
- Continue to provide opportunities for public recreational use at the current level and to explore opportunities for increase and enhancement in the future.
- Protect cultural heritage resources.
- Provide a diversity of habitat capable of supporting viable populations of native fish and wildlife species.
- Protect biological diversity on the TFL.

3.3 Integration of Harvesting with Non-Timber Uses

Objectives for integrating harvesting with non-timber uses are:

- Consider the needs of other licensed users during planning and operations within TFL 56. At present, these users include guide outfitters, backcountry ski touring operators, helicopter ski and hiking operators, miners, and water users.
- Foster a cooperative relationship with First Nations groups having an interest in the TFL area.
- Consider forestry activities and other potential impacts on the existing highway infrastructure.

3.4 Forest Health and Forest Protection

Objectives for maintenance and protection of the forest resources are:

- Maintain a forest health program that will promote healthy conditions within the forest.
- Minimize losses caused by forest fires, insects, diseases, and other damaging agents.

3.5 Silviculture

Silvicultural objectives include:

- Maintain a basic silviculture program that complies with forest legislation and ensures prompt and appropriate restocking of productive forestland.
Undertake selected treatments on free-growing stands that result in increased forest growth, reduced losses to pests and diseases, and improved timber quality in the future.

3.6 Roads

Objectives relating to forest access structures are:

- Design, construct, and maintain roads in accordance with all applicable Ministry of Forests requirements.
- Respond promptly to road-induced erosion hazards in order to minimize environmental damage.
- Deactivate roads in accordance with all applicable Ministry of Forests requirements.

3.7 Other

Other objectives include:

- Provide open and accessible information to the public concerning the management of TFL 56.
- Provide local opportunities by hiring local consultants and contractors when available.
4.0 Planning

4.1 General

TFL 56 occupies a very challenging landscape. Extreme topography, productive forestland (often occupied by low value forests), recreationally valuable landscapes, and valuable habitat combined with a historic harvest pattern that is at odds with present-day management ideals together create considerable planning challenges. In this environment, RCFC must profitably harvest and reforest its lands while ensuring that future opportunities will not be compromised, and other resources are adequately managed.

In order to profitably harvest both now and in the future without compromising other forest values, careful planning must take place. The basis of any sound planning process is good information. RCFC has collected or recently improved the following information:

1. Aerial photography
2. Digital orthophotos
3. 1:5,000 5-metre contour interval mapping
4. Total chance harvest plans
5. Operability mapping
6. Forest cover mapping
7. Avalanche likelihood mapping
8. Caribou habitat mapping
9. Recreational features inventory
10. Recreation opportunity spectrum classification
11. Terrain stability mapping
12. Stream, lake, and wetland classification and inventory
13. Vegetation Resource Inventory mapping
14. SPOT5 Satellite Imagery – False Colour Composite Maps

The information collected is of limited utility unless it is in a form that is convenient to use. To this end, RCFC has developed, through local consultant Azimuth Forestry and Mapping Solutions, a digital map database with layers that include:

1. TRIM map data
2. Forest cover data
3. Biogeoclimatic zone line work
4. 5-metre contour interval mapping
5. Digital orthophotos
6. Operability mapping
7. Total chance harvest plans
8. Recreation inventories
9. Revelstoke Higher Level Plan Order recommendations

With this information in the RCFC database, intensive planning is both possible and effective. RCFC began an intensive planning project in 1998. The initial objective was to delineate a truly operable landbase while setting aside areas to meet forest cover objectives required for biodiversity, caribou, ungulate winter range, and other resources. In 2008, this planning has been revisited and refined as better information (local knowledge and updated inventories) becomes available.
The areas within the caribou management zone, status quo and incremental habitat has are reserved from harvest. Requirements of the non-spatial old-growth objectives are “spatially” located and used to meet biodiversity requirements.

**Figure 17.** Management Zones in TFL 56 -- Caribou.
4.2 Strategic Plans

4.2.1 Kootenay-Boundary Land Use Plan

The Commission on Resources and Environment (CORE) was created in 1992 to address land use planning issues throughout the province. The Revelstoke area, including TFL 56, was included in the Kootenay-Boundary Land use Planning (KBLUP) CORE process.

In 1994, CORE issued the West Kootenay Report. This report, which included Revelstoke, predicted a large decrease in timber supply due to its recommended

---

**Figure 18.** Management Zones in TFL 56 -- Biodiversity.
management practices. The residents of the Revelstoke area were understandably concerned with this result and felt that local experience and expertise could be used to develop a plan that better addressed the values identified. The residents requested the opportunity to develop their own recommendations and the government agreed to consider this.

A community committee was appointed to develop an alternative approach. The committee, known as the Minister’s Advisory Committee (MAC), became involved in the land use planning process. The main task was “to begin to implement the West Kootenay Land Use Plan for Revelstoke and Area by developing strategies which address the values identified”\(^1\). Meanwhile work on the KBLUP continued. The provincial government approved the KBLUP Implementation Strategy in July 1997.

RCFC’s TFL 56 is entirely within the area that the MAC recommendations cover. This MAC plan was accepted by the provincial government and portions of the plan became the Revelstoke Higher Level Plan Order in 2001.

### 4.2.2 Revelstoke Higher Level Plan Order

The Revelstoke Higher Level Plan Order (RHLPO) was endorsed by government in April 2001. This Order was developed from portions of the *Revelstoke and Area Land Use Planning Final Recommendations*, released October 1999. RCFC has abided by all the requirements in the RHLPO and used them to determine the “base case” timber supply forecast in the *Timber Supply Analysis Report*. The Revelstoke Higher Level Plan Order is available in Appendix 4A.

### 4.2.3 SaRCo Caribou Management

The Species at Risk Coordination Office (SaRCO) has drafted caribou management guidelines (GAR Order #U-3-005) and associated spatially explicit reserves within the Revelstoke – Shuswap Planning Unit. The Order was signed December 12, 2008 that incorporates both status quo and incremental reserves into one order. The HLPO has been amended now that the GAR Order has been signed to rescind the caribou guidelines. The GAR Order #U-3-005 is available in Appendix 4B.

The government has committed to implementation monitoring and reviewing of status quo areas over the next three years. The purpose of this activity will be to determine if any no harvest areas should be relocated for the benefit of both caribou and licensees. This process will be developed in a future partnership with Ministry of Environment, Ministry of Forests and Range, Integrated Land Management Bureau, the herd expert and licensee representative.

---

\(^1\) Revelstoke and Area Land Use Planning Recommendations, October 1999
4.2.4 Timber Supply Analysis

The timber supply analysis is used to provide a basis for the Annual Allowable Cut (AAC) proposed in Management Plan #4 to provide a projection of expected timber supply over the next three centuries, and to provide an approximation of selected forest conditions over time. The full report, entitled Revelstoke Community Forest Corporation Management Plan #4, Analysis Report can be found in Appendix 10.

RCFC chose to use Patchworks™ to complete the timber supply analysis. Patchworks is a fully spatial forest estate model that can incorporate real world operational considerations into a strategic planning framework. It utilizes a goal seeking approach and an optimization heuristic to schedule activities across time and space in order to find a solution that best balances the targets/goals defined by the user. Targets can be applied to any aspect of the problem formulation. For example, RCFC used the model to limit the amount of pulpwood and aerial timber harvesting that could occur in any one decade. Patchworks continually generates alternative solutions until the user decides a stable solution has been found. Solutions with attributes that fall outside of specified ranges (targets) are penalized and the goal seeking algorithm works to minimize these penalties – resulting in a solution that reflects the user objectives and priorities. Weightings are designed such that hard constraints are either met immediately or as soon as possible given the initial conditions.

The purpose of this analysis is to examine both the short- and long-term timber harvesting opportunities in TFL 56, in light of current forest management practices. Modeling assists the timber supply analyst in assessing the harvest flows associated with various scenarios. Management scenarios are groups of assumptions that define the extent of the timber harvesting land base, timber volumes, and the management regimes. The dominant scenario in this report is the Base Case Option, our current management scenario. Modeling was completed for a minimum of 300 years for each scenario to confirm that the harvest and growing stock levels remain stable.

The results of the analysis are an important part of the annual allowable cut determination process and aim to document future harvest flows that will not restrict future options in the TFL. The results presented here do not define a new AAC – they are intended only to provide insight into the likely future timber supply of Tree Farm License 56. The final harvest level decision will be made by the Chief Forester and published along with his rationale in an AAC Determination document.

The analysis was completed on a net landbase described in Table 6 and depicted on the net-down map in the information package. The gross area of TFL 56 is 119,747.6 hectares, but with the series of net-downs, the long term THLB is 21,372 hectares.
Table 5. Land Base Net-down Summary.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Total area (ha)</th>
<th>Effective Area (ha)*</th>
<th>% of TFL</th>
<th>% of Crown forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total TFL Area</td>
<td>119,823</td>
<td></td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Non-forest / Non-productive forest</td>
<td>58,822</td>
<td></td>
<td>49.0%</td>
<td></td>
</tr>
<tr>
<td>Existing roads, trails and landings</td>
<td>1,146</td>
<td></td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td><strong>Total Crown Forested Land Base (CFLB)</strong></td>
<td>59,855</td>
<td></td>
<td>50.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Less:

<table>
<thead>
<tr>
<th>Factor</th>
<th>In CFLB:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks / LRUP Reserves</td>
<td></td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Inoperable/Inaccessible</td>
<td>23,770</td>
<td>23,770</td>
<td>19.8%</td>
<td>39.7%</td>
</tr>
<tr>
<td>ESAs / Unstable Terrain</td>
<td>1,822</td>
<td>1,741</td>
<td>1.5%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Low Productivity Sites</td>
<td>3,540</td>
<td>360</td>
<td>0.3%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Non-Merchantable Forest Types</td>
<td>2,503</td>
<td>1,725</td>
<td>1.4%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Riparian Reserves</td>
<td>1,492</td>
<td>1,124</td>
<td>0.9%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Backlog NSR</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Wildlife Habitat Areas</td>
<td>2</td>
<td>2</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Cultural heritage resources</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Downie Saltlick</td>
<td>19</td>
<td>14</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Mountain Caribou Reserves</td>
<td>10,611</td>
<td>7,984</td>
<td>6.7%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Isolated THLB</td>
<td>123</td>
<td>123</td>
<td>0.1%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Site Specific Inoperable Areas</td>
<td>669</td>
<td>437</td>
<td>0.4%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Timber Harvesting Land Base –THLB (ha)

<table>
<thead>
<tr>
<th>Less Other Removals:</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate of Future Roads, Trails, and Landings</td>
<td>459</td>
<td>0.4%</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>Wildlife Tree Patches</td>
<td>388</td>
<td>0.3%</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>Old Growth Management Areas**</td>
<td>355</td>
<td>0.3%</td>
<td>0.6%</td>
<td></td>
</tr>
</tbody>
</table>

Effective Long-term THLB (ha)

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21,372</td>
<td>17.8%</td>
<td>35.7%</td>
<td></td>
</tr>
</tbody>
</table>

Results show the base case harvest flow starting at 88,000 m$^3$/yr. This harvest level, which is 12% below the current AAC, is sustained for the first 10 decades and then increases to 101,000 m$^3$/yr in the long term. This harvest flow was selected over the alternative where a series of downward reductions would occur over the next 10 years because it was considered preferable to move to a stable harvest level immediately. In all cases, a strong pinch point exists 45-55 years from now when the transition from natural to managed stands is first occurring in a significant way.
The dramatic change in the harvest flow relative to MP3 is primarily a result of:

- Reduced starting available growing stock (new inventory attributes from VRI, 8 years of harvest have occurred since the MP3 projection).
- Helicopter harvest limited to 8% of the harvest volume in each period.
- Increased managed stand yields resulting from improved site index estimates (SIBEC) in the ICH and the use of improved (class A) seed.
- Minimization of very small (<3 ha) and very large (>250 ha) patches (played a small role).

In order to assess the impacts of potential changes to modeling assumptions, and gain further understanding of the dynamics at work in the base case forecast, a series of sensitivity analyses were completed (see Analysis Report for more detail).

Uncertainties that significantly altered the short-term harvest level were:

- Increase the size of the timber harvesting land base by 10% (+6%),
- Decrease the size of the timber harvesting land base by 10% (-10%),
- Limiting the pulp profile to 20% of the harvest volume each period (-14%),
- Increase of minimum harvest ages by 10 years (-12%),
- Reduction of natural stand yields (-13%),
- Increase of natural stand yields (+5%),
- Exclusion of hemlock leading stands greater than 80% (-7%),
• No management for mountain caribou (+18%)
• Only Status Quo caribou reserves – no incremental reserves (+6%)

Uncertainties that significantly altered the long-term harvest level were:
• Removal of SIBEC site index adjustments (-21%)
• Decrease in allowable pulp limit (-8%)
• Changes to the size of the timber harvesting land base (+/- 10%),
• Decrease of future managed yield curves by 10% (-10%)
• Increase of future managed yield curves by 10% (+ 9%)
• Increase of minimum harvest ages by 10 years (-5%)
• No management for mountain caribou (+16%)
• Only Status Quo caribou reserves – no incremental reserves (+5%)

The short-term harvest flow is very sensitive to decreases in natural stand volume or delays in when managed stands come online.

Based on the results presented here, RCFC feels a decrease in the AAC for TFL 56 to 88,000 m³/yr for the next 5-year term is desirable. This harvest level is felt to best reflect the community’s desire for a balance between sustainable forest management and revenue generation.

4.2.5 20-Year Plan

A 20-year plan is a traditional part of the Management Plan process. One purpose of this plan is to provide spatial verification that the proposed AAC is feasible given all of the guidelines, constraints, and rules that apply to the landbase. With the use of a spatial model such as Patchworks, the 20-year plan is merely a subset of the output that is available. The entire planning horizon can be viewed spatially with its associated timber and non-timber outputs. The 20-year plan is presented in the Timber Supply Analysis Report and is simply a summary of the first 20 years of model results. The assumptions and data used in the 20-year plan are therefore the same as those documented for the base case. Harvest forecasts and non-timber outputs (seral stages, patch size, etc) associated with the 20-year plan are also consistent with the base case and are documented in the Timber Supply Analysis Report.

4.2.6 Local Resource Use Plans

Local Resource Use Plans (LRUP’s) may be required when critical resource issues or demands in a particular area cannot be resolved by the usual planning process. A LRUP is a resource management plan with detailed prescriptions for a specific area. A formal committee prepares it with representatives from government, the public, and the affected Licensee. Specific terms of reference are drawn up to ensure that a LRUP achieves a consensus from all parties involved.

If a contentious resource issue concerning an area on TFL 56 arises that requires a high degree of public input, RCFC is prepared to initiate and participate in a LRUP process.
4.3 Operational Plans

The requirements for operational planning are detailed in the *Forest Planning and Practices Regulation* of the *Forest and Range Practices Act*. The only operational plan is the Forest Stewardship Plan (FSP). This plan and others are discussed below.

4.3.1 Forest Stewardship Plans

Forest Stewardship Plans (FSP’s) are required under the Forest and Range Practices Act. The Forest Stewardship Plan term is five years but may be extended a further five years with the written notice of the minister in circumstances specified by regulation. The plan will show the Forest Development Units (FDU) and outline the intended results or strategies for the objectives set by the government.

RCFC’s Forest Stewardship Plan was approved August 11, 2005 and will be amended as necessary. The Plan will be rewritten during the term of this management plan.

4.3.2 Other Plans, Prescriptions and Permits

Other plans, prescriptions, and permits include; site plans, stand management prescriptions, road permits, cutting permits, deactivation prescriptions, and special use permits. These are described below.

**Site Plans** (SP’s) are prepared for all proposed cutblocks and roads prior to harvesting. Under the Forest and Range Practices Act a Site Plans must include of the following information:

- Identify the approximate locations of cutblocks and roads
- Be consistent with the forest stewardship plan, this Act and the regulations
- Identify how the intended results or strategies described in the forest stewardship plan apply to the site.

RCFC includes:

- Tenure details,
- Area details,
- Objectives,
- Ecological information,
- Management objectives,
- Conservation of soil and site productivity
- Silvicultural system,
- Anticipated harvest prescription,
- Anticipated silviculture prescription, and
- Silviculture stocking standards.
Stand Management Prescriptions (SMP’s) are meant to provide information on, and a proposed prescription for, free growing stands where enhanced stand management activities are proposed. Such activities include spacing, pruning, fertilization, and other treatments. They also describe the treatments proposed, ecological site information, post-treatment stocking standards, and non-timber resource values.

SMP’s are no longer required to be approved by the Ministry of Forests and Range. RCFC will continue to use SMP’s when necessary to outline objectives desired in the implementation of the plan.

Road permits are issued by the Ministry of Forests and Range and are required prior to road construction on the Tree Farm Licence area. They must be in an FDU of an approved FSP and consistent with the TFL agreement.

Cutting permits are also issued by the Ministry of Forests and Range. They provide the authority to harvest timber and must be in an FDU of an approved FSP and consistent with the TFL agreement. RCFC will submit a sufficient quantity of cutting permits to ensure an adequate log supply without unnecessary slow-downs in harvesting.

Deactivation Prescriptions for roads will be prepared for all planned deactivation. These prescriptions outline in detail the type of work required at each section of road.

Special Use Permits are required for certain uses not covered in the licence document. Examples include work camps, borrow pits, and radio repeater sites. These are updated as required.
5.0 Timber Resource Management

5.1 Allowable Annual Cut

The timber supply analysis report (Appendix 10) presents the results of the base case and several sensitivity analyses. The analyses are illustrated in Section 4.2.4 of this report and fully described in the *Revelstoke Community Forest Corporation Management Plan #4 Analysis Report*.

Some of the key conditions that the base case is predicated upon are:

- Use of spatial OGMA’s, caribou reserves and percentage constraints for mature + old seral objectives in managing biodiversity constraints.
- A long term harvesting landbase of 21372 hectares
- An initial harvest level of 100,000 m³ per year.

The sensitivity analyses tend to support the base case. Very brief summaries of the sensitivity analyses are:

- Reducing the size of THLB had proportional effects on the AAC while increasing the THLB by 10% had an increase of 6% on the AAC. The reworking of the operability line in this management plan was more conservative than Management Plan #3.
- Yields from natural stands have the most effect in the short term harvest level as the transition from natural to managed stands at 45-55 years is the critical pinch point in the analyses. The natural stand yields do not appear to be unrealistic.
- A reduction in minimum harvest ages did have an effect on the short term harvest levels. The current minimum harvest ages appear to be realistic from field observations.
- Reducing natural stand volumes does not affect the LTHL, but does affect short-term harvest levels. Again, the natural stand volumes do not appear to be unrealistic.
- Using percent seral constraints over spatial OGMAs had no change on harvest levels.
- Removing status quo and incremental caribou habitat gave us an idea of the impacts on timber supply when managing for mountain caribou.
- Full SIBEC site productivity estimates in the ESSF had little effect on harvest levels. Removing the SIBEC site productivity estimates had minimal effects on short term change but had substantial effects on the mid and long term harvest levels. Better information will be available for the next AAC determination as RCFC collects actual growth intercept from regeneration surveys.
- Increasing the incidence of Armillaria root disease in Douglas-fir stands had no impact on harvest levels as fir stands represents a small proportion of area on the TFL.
- Removing hemlock leading stands does reduce the harvest levels more in the short term than the long term. Many of these sites are
quite productive and desirable to harvest in order to generate productive future stands.

- Decreasing pulp percentage limits has a significant effect on short term harvest levels. The base case was modelled for 35% pulp harvest as is the past harvest average for RCFC.

- The removal of aerial harvesting sees a sizable reduction of short and mid term harvest levels while the long term reduction is 8% (roughly the proportion of aerial harvest landbase on the TFL). RCFC’s past history documents 8% of helicopter over the last 12 years. Aerial systems (Wyssen & skyline) also contribute to harvesting in this area however currently no Wyssen is available.

- No patch management showed minimal change in harvest levels.

The analysis indicates that based upon current inventory, growth and yield projections, and management practices, timber harvesting can be maintained at the current level for ten decades before increasing to long term harvest levels. The sensitivity analyses document the significance of the pinch point in timber supply between 45 and 55 years. This is the time that the managed stands will come online and natural stands are relied on much less. Any reductions in landbase or reduction of yield in this time will have significant downward pressure to the short term harvest levels.

Based upon this, RCFC recommends an annual allowable cut of 88,000m$^3$ per year for the period of Management Plan #4. During the Management Plan #4 period, RCFC will continue to refine operational plans, optimize reserve areas, investigate utilization of deciduous volumes and look to enhanced stand management activities.

### 5.2 Harvesting

#### 5.2.1 Harvesting Priorities and Guidelines

Harvesting taking place on TFL 56 will be in accordance with the TFL agreement and legislative requirements as well as the following:

- *Forest and Range Practises Act* and other relevant legislation and regulations.
- Revelstoke Higher Level Plan Order
- GAR Order #U-3-005

Priorities for harvesting are set by first using the 20 year plan and the parameters set down in the above documents. Then, RCFC uses current market conditions to prioritize harvesting. For example, if spruce log prices are high, RCFC will shift harvesting to stands with a high component of spruce. With RCFC’s forest inventory being rather high in low quality hemlock stands, RCFC is always ready to shift harvesting priorities to these types of stands when any improvements to hemlock pulp markets occur. As well, when markets are generally high, RCFC shifts to higher cost or lower value stands to “save” the more profitable stands for more difficult market conditions.
5.2.2 Harvesting Systems

Prior to 1994, RCFC’s landbase was harvested primarily by ground-skid methods. This method was suitable to the gently sloped portions of the TFL.

The steep slopes were a problem, and it was apparent to RCFC when they purchased the TFL that use of suitable harvesting systems would be the key to effective utilization of the TFL 56 forested landbase. Soon after the purchase in 1993, RCFC shifted primarily to cable harvest systems. However, even cable did not allow full utilization of the landbase. In Management Plan #2, RCFC stated, “In the future, RCFC foresees the need to introduce other alternative logging systems. These may include multi-span Skylines, helicopters and long-line yarding systems.” Further, RCFC committed to “incorporate all or some of these alternative logging systems during the period of Management Plan #2.”
RCFC first tried **helicopter harvesting** in 1995. RCFC proceeded with several blocks in an isolated area in Downie Valley and found that it was viable on TFL 56. Since then, RCFC has increased the proportion of lower quality timber in helicopter harvest areas. In 1994, helicopter harvesting comprised close to 0% of the area harvested (some helicopter cedar salvage took place). By 1998 helicopter harvesting comprised 11% of the area and in 2005, 23% of the annual harvest was logged by helicopter due to the high component of burned timber from fires in 2003. Helicopter harvesting is now a current practice” on TFL 56. Since the inception of helicopter harvesting on the TFL, an average of 8% of the current harvested area is by helicopter.
RCFC started longline harvesting in 1997 with a single block harvested by a local contractor, Murray Saunders, who had developed a skyline machine. The block was completed successfully at a lower cost than if the block had been logged by helicopter. Mr Saunders is now a permanent fixture on TFL 56.

Meanwhile, RCFC staff investigated Wyssen skyline systems – one of our contractors bought a Wyssen system. The Wyssen worked for four years and was very successful. Due to extenuating circumstances, the Wyssen is no longer available but RCFC staff are looking into other contractors with this system. The two skyline systems would theoretically give us a capacity in excess of 15000 m$^3$ annually. It is considerably less expensive to harvest with a longline or skyline system than a helicopter system.
RCFC continues to investigate other systems for use on TFL 56. Some that warrant mention here are:

- Use of **long distance forwarding** with other harvest systems – This is to reduce road costs in cases where the costs would exceed the value of the wood accessed by the road. A forwarder would use a narrower and steeper road thereby lessening the amount of road and the unit cost of the road.

- Summer **ground skid harvesting using low ground pressure equipment** – This would be to reduce snow-ploughing costs in high elevation areas. RCFC has shied away from summer ground skidding mainly because few areas were found suitable in recent years and if found suitable, there was a local prejudice against such systems because of poor practices in past decades. New operating areas are presently being harvested using this method.

- **Hybrid systems** – This includes combination helicopter/cable, cable/ground skid or helicopter/ground skid. Such hybrid systems allow the creative use of leave trees or larger reserves where required for such reasons as avalanche amelioration or slope instability retention areas. These hybrid systems could also reduce harvesting costs significantly.

---

**Figure 23.** Skyline Harvesting.

*To the left is CP 172 block 1 in the Sorcerer Valley harvested in late 2000 with a Wyssen skyline owned by Encampment Creek Logging of Revelstoke. On the right is an intermediate support and jack for the same Wyssen system employed at Devil's Garden.*
Figure 24. Harvest Systems In Use In TFL 56.

In the chart above, the trends described in the above paragraphs are apparent. In 1993, over 80% of the harvest was derived from ground skidding. Ground skidding resurgence in 1997 and 1998 reflected special winter ground skidding in group-selection silvicultural system areas. In the longer term, ground skidding is expected to comprise 30%. Cable systems were rapidly deployed in 1994 to cope with the steep slopes in the TFL and have become the most common system. In the longer term, use is expected to be about 50%. Helicopter systems were initially tried in 1995 and continue to be used at an average rate of about 8%. The first skyline area was logged in 1997 – use of skyline and longline systems is projected to be about 7%.

In the MP #4 period, RCFC expects that the projection indicated on the above chart will be reasonable. “Other” systems, as described in the paragraphs above, will begin to be used – likely at a rate of about 5%. The base case analysis will use an 8% limit on aerial harvest systems. Currently helicopter and longline harvesting accounts for approximately 8%. RCFC would like to see the actual aerial harvesting increase to 15% (8% helicopter and 7% longline) but have modelled the actual harvesting opportunities of present day.
5.2.3 Silvicultural Systems

Although even-aged systems such as clearcutting have been used extensively and continue to play a leading role in RCFC’s plans, the use of alternate systems has become common. This trend is illustrated in Figure 25. In Table 6, the use is portrayed in more detail.

![Silviculture System Use](image)

**Figure 25.** Silviculture Systems In Use In TFL 56

**Clearcutting** will continue to be the most commonly used silviculture system on TFL 56. It is used where visual or biological reasons to use alternate systems do not exist. The variant, **clearcutting with reserves**, is often used. The reserves are most often groups of trees rather than single trees and are left to provide wildlife habitat or old tree “legacies” in the regenerated stand. Another variation of clearcutting is the use of very small openings. RCFC has harvested several blocks under 5 hectares in size and finds that this is an effective way to harvest small “helicopter” patches without significantly affecting visual quality. Approximately 70% of the area harvested in TFL 56 in recent years has been harvested with the clearcut silviculture system or a variant of the clearcut system. We expect this trend to continue.

**Group selection** has been used often in the TFL. This system has been used to promote wildlife habitat, reduce visual impacts, improve reforestation success and will be used in the future for these reasons as well as to reduce the chance of destructive avalanche damage in avalanche-prone areas. There have been two variations used – in the ICH biogeoclimatic zone, the system has been designed with a three-pass pattern of groups. These groups are up to 1 hectare in size. In the ESSF biogeoclimatic zone, the three-pass pattern is also used, but the groups are less than 0.5 hectares. In recent years, small group selection has been used in second growth stands. These groups are unmappable areas that are typically 20 by 30 meters.
RCFC has also been using **single tree selection** silviculture systems in many second growth stands. Single tree selection is seen as a viable system on high elevation ESSF blocks where forest regeneration, or caribou management are concerns. In low elevation ICH areas, it is seen as a system that is compatible with caribou friendly cutting to minimize brush competition and promote old-growth characteristics. RCFC will continue to apply this system where appropriate.

**Figure 26.** Group Selection Silviculture System in the Keystone Area.

**Figure 27.** Single Tree Selection Silviculture System Near Cap Creek.
The **shelterwood** system has been used in TFL 56 in areas of wildlife management, visual management, or avalanche concern. Of particular interest is the use of this system near the Canadian Mountain Holidays Adamants lodge for visual management reasons.

![Shelterwood Silviculture System](image)

**Figure 28.** Shelterwood Silviculture System.  
This block, CP 150 block 6, was harvested in this manner to remove spruce bark beetle infected trees while maintaining valley bottom ungulate habitat.

Although **commercial thinning** is not a silvicultural system, it is often discussed in the context of alternate silviculture systems. RCFC has commercially thinned several stands and will continue to use this method. It is seen as a tool to extract volume from an area while improving the future stand and still providing ungulate winter range or other biological values.

![Commercial Thinning](image)

**Figure 29.** Commercial Thinning.  
This 70 year-old 3-hectare site was thinned to focus growth on fewer stems. It is scheduled for harvest in 2030.
Table 6  Silviculture Systems in use in TFL 56 (as reported in RCFC Annual Reports).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearcut &gt; 5 ha</td>
<td>262</td>
<td>184</td>
<td>115</td>
<td>270</td>
<td>195</td>
<td>96</td>
<td>106</td>
<td>146</td>
<td>100</td>
<td>129</td>
<td>125</td>
<td>161</td>
<td>178</td>
<td>165</td>
<td>187</td>
</tr>
<tr>
<td>Clearcut &lt; 5 ha</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>19</td>
<td>9</td>
<td>178</td>
<td>96</td>
<td>185</td>
<td>115</td>
<td>262</td>
<td>184</td>
<td>115</td>
<td>270</td>
<td>195</td>
</tr>
<tr>
<td>Shelterwood</td>
<td>68</td>
<td>2</td>
<td>7</td>
<td>9</td>
<td>19</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Selection</td>
<td>63</td>
<td>86</td>
<td>72</td>
<td>42</td>
<td>32</td>
<td>35</td>
<td>31</td>
<td>146</td>
<td>100</td>
<td>227</td>
<td>227</td>
<td>227</td>
<td>227</td>
<td>227</td>
<td>227</td>
</tr>
<tr>
<td>Total</td>
<td>262</td>
<td>184</td>
<td>115</td>
<td>341</td>
<td>260</td>
<td>185</td>
<td>178</td>
<td>227</td>
<td>155</td>
<td>200</td>
<td>170</td>
<td>229</td>
<td>228</td>
<td>203</td>
<td>313</td>
</tr>
</tbody>
</table>

RCFC will continue to utilize a variety of silviculture systems during the Management Plan #4 period. Systems will be chosen site specifically with regeneration, wildlife habitat, visual quality, and other objectives in mind.

5.2.4 Utilization Standards

RCFC will follow the Ministry of Forests and Range, Waste and Residue Manual for utilization standards (Table 7). Variation from these standards may be required occasionally.

RCFC’s utilization of deciduous species will remain optional for the term of Management Plan #4. RCFC has operated in a few second growth stands with a deciduous component. In most cases, there have not been enough merchantable deciduous stems to make a feasible market. During the term of MP #4, RCFC expects to operate in some stands with a higher component of deciduous trees. When deciduous volume is available, RCFC will experiment with sales of deciduous volumes. Birch sawlog and cottonwood pulp log markets will be examined and utilized if feasible. Based on success of these sales, RCFC will consider committing to utilization of some, or all, deciduous species during the term of MP #5.

5.3 Forest Road Systems

The objective of the forest roads on TFL 56 is simply to provide safe, efficient, and environmentally appropriate transportation corridors from the forest stands to the public highway. The terrain that the roads pass through is quite difficult and requires careful road design, engineering, and construction.

5.3.1 Road System Planning and Development

The road system has been developed progressively over the past 40 years. Initially, the system was designed for off-highway hauling to the Columbia River where the logs were dumped. By the mid 1970’s, as a result the Revelstoke
Dam, log transport was converted to highway hauling using the rebuilt Big Bend
Highway (Highway 23).

The road system is now designed to transport logs to the market via Highway 23
to Revelstoke and then beyond if necessary. Pulpwood is sent to Shelter Bay log
dump for delivery to Castlegar. Sawlogs may end up at any of the three local
mills or at RCFC’s log yard for sale on the open market. The distances provided
in Table 8 illustrate some typical distances and cycle times. The present road
system is shown in Figure 30.
Figure 30. Present and Projected Road System In TFL 56.
### Table 7  Typical Log Hauls to RCFC Sortyard.

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance (km)</th>
<th>Cycle Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 km on Key Road</td>
<td>68</td>
<td>3.7</td>
</tr>
<tr>
<td>30 km on Downie Road plus 8 km on spur road</td>
<td>100</td>
<td>5.5</td>
</tr>
<tr>
<td>30 km on Goldstream Road plus 8 km on spur road</td>
<td>127</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Main road access will be maintained in the Goldstream and Downie Valleys during the plan period. New roads have been extended into East Brewster and West Brewster Creek. The road in Sorcerer Creek has been extended to the end of the valley, as has the Tumbledown Creek road.

Other major road headings include a road into the upper Mars Creek valley and the North Goldstream road.

In addition to these major developments, there will be many smaller road systems and spurs built during the plan period. All access structures will be built to the regulatory requirements in force at the time.

Grass seeding is carried out on new roads following construction to minimize erosion. Figure 31 shows a road under construction using the end-haul technique.

![Figure 31. End-Haul Construction at Brewster Valley](image-url)
5.3.2 Maintenance

Maintaining the road system is expensive but necessary to permit safe operation of logging trucks, to provide safe access to the public, and to prevent environmental damage. This is achieved by completing these activities:

- Grading road surfaces,
- Clearing ditches,
- Cleaning culverts to ensure adequate water flow,
- Inspecting and maintaining bridges and major culverts,
- Removing slide and slough material,
- Stabilizing road banks,
- Brushing roadsides to maintain adequate visibility,
- Falling dangerous snags adjacent to roads,
- Spot gravelling, and
- Sign maintenance.

Regular inspections are completed on roads and the maintenance levels are somewhat dependant on use. For example roadside brushing will be completed quite frequently on the main roads but infrequently on lesser-used spurs. Inspections are completed on roads at least annually in the spring as the snow is melting to ensure drainage structures are working properly.

5.3.3 Deactivation

RCFC generally considers roads to be an investment in the land base and thus will be protected like any other forest investment until the next entry. Thus, RCFC will only deactivate roads that have access management or stability issues.

5.3.4 Access Management

Access management refers simply to actions taken to “manage” access to areas. This usually means limiting access – typically for wildlife management reasons.

Use of forest roads in TFL 56 is still largely industrial in nature – logging contractors, silviculture workers, and forestry people. However, mining, micro-hydro projects, commercial recreation, and private recreational access is increasing.

With timber development comes increased road access. The increased traffic can lead to disturbance and additional hunting pressure on wildlife. Actions to reduce wildlife disturbance and hunting pressure can include avoidance of road construction, road deactivation, or administrative road closures. All of these methods are used in TFL 56.
The Downie Valley has an administrative road closure imposed on it. Hunting from motorized vehicles is prohibited. Hunters must walk, ride horses, or ride bicycles in. This has reduced the impact of the road on wildlife. However, there is still the disturbance issue. RCFC has avoided extending the road along the south side of Downie Creek between 8 km and 15 km in order to prevent wildlife disturbance. RCFC has longline and helicopter logged in this vicinity to avoid roading.

RCFC will continue to work with government biologists to identify areas of access concern and create site-specific solutions.

5.4 Silviculture

The purpose of the silviculture program is to promptly regenerate forest sites with crops that will produce the desired products within the desired time frames. Silviculture activities will be carried out to ensure that all harvested areas, and where possible, productive areas contributing to the THLB that are denuded by wildfire or pests, are reforested with acceptable coniferous and hardwood species. Regenerated stands will be tended to maintain growth rates and improve timber quality.

During the period of the last Management Plan, the reforestation of all economically treatable backlog NSR areas (areas harvested pre October 1987) was completed, and all recently logged areas were promptly reforested.

The goals of the silviculture program are to:

- Regenerate all logged areas within a maximum of three years of logging being completed (the average time is expected to be less than two years);
- Conduct an aggressive brush control program to maximize stand vigour and health;
- Comply with the Forest Stewardship Plan in satisfying free-growing stocking standards;
- Use regeneration techniques that will increase productivity;
- Establish regeneration with mixtures of two or more species ecologically suited to the growing site;
- Establish silvicultural trials where knowledge of an activity or treatment is inadequate. (RCFC currently has active trials on the following subjects: brush blankets, tree supports, seedling fertilization, mounding, etc.)
5.4.1 Basic Silviculture

Basic silviculture will be performed on all areas harvested in compliance with the Forest Planning and Practices Regulation. The reforestation costs of this program will be paid for by RCFC.

Site Plans. Site Plans (SP’s) will be prepared for all cutblocks prior to harvesting; SP objectives are to be consistent with the objective set out in the approved FSP. Silviculture planning will be completed for all areas in accordance with the Forest Practices and Planning Regulation. Each SP will describe the silviculture system to be used, harvesting method, reforestation treatment and stocking standards (from approved FSP). The Chief Forester’s Standards for Seed Use, which provide rules for the elevational and longitudinal transfer of seedlots, will be followed.

Biogeoclimatic subzones or variants in TFL 56 to which these standards apply are:

- ESSFvc
- ICHwk1
- ICHvk1
- ICHmw3

Conifer Stand Establishment. Stand establishment strategies will focus on prompt reforestation after harvesting. On areas where significant brush competition is expected, planting will occur within one to two years following harvesting. On areas that have a lower potential for brush competition planting will occur within two to three years after harvesting. All areas will be planted at prescribed target levels.

Supplementary natural regeneration fill-in will be recognized providing it conforms to the SP and approved FSP stocking standards. Planted species choice will be made to ensure mixtures of species are established both by planting and through the recruitment of natural regeneration. These mixtures of species will comply with the stocking standards specified in the current approved FSP.

Once an area is sufficiently restocked, plantation health and growth will be monitored through silviculture surveys until a free growing stand is achieved. Stand tending treatments will be prescribed during this period to maintain the vigour, growth, and health of the regeneration. Where necessary, fill planting will be done to meet stocking standards.

Mixed Wood Stand Establishment. Hardwood species grow well in the interior cedar/hemlock subzones on a wide range of site series that occur on the TFL. Hardwoods contribute significantly to nutrient cycling due to deciduous growth habit, rapid litter decomposition, and high foliar nutrient concentrations.

There was no provision for hardwood management in Management Plan #3. RCFC encourages some deciduous species in plantation for nutrient cycling and root disease mitigation but stays within the required free growing guidelines as
outlined in the Establishment To Free Growing Guidebook – Nelson Forest Region – 2000 (as stated in approved FSP stocking standards). RCFC will continue to explore marketing opportunities for deciduous species during the MP #4 period.

**Site Preparation.** Site preparation will be carried out to create plantable spots, facilitate planting (break up slash accumulations, set back competing vegetation, improve soil growing conditions), or to reduce fire hazard. This may be accomplished by treatments such as spot burning, broadcast burning, mechanical site preparation (excavator piling or mounding primarily), or chemical treatments.

Usually the burning of debris piles at landings and along roadsides is all that is required to prepare for planting. As a general practice, there has been a reduction in the use of burning on the TFL area for the following reasons:

- Risk of escape into standing timber.
- Social unacceptability.
- Increasing need to retain clumps of trees within cutblock boundaries.
- Limited weather related windows.

**Reforestation.** Target stocking levels will generally be achieved through planting. Natural regeneration will add (10-20%) to species composition and assist in addressing biodiversity issues. A mixture of ecologically suitable conifer species will be planted dependent on subzones and site series.

The objective will be to plant a mixture of two or more species on all sites. RCFC will continue to plant and monitor the performance of rust resistant white pine. Only twenty percent, or less, white pine will be planted on any one cutblock during this trial period. RCFC will plant minor amounts of western larch, yellow cedar, lodgepole pine, and mountain hemlock on some ecologically suitable sites.

The approximate distribution of species to be planted is:

- 40% Western Red Cedar
- 35% Engelmann Spruce
- 10% Douglas-fir
- 8% White Pine (rust resistant)
- 7% Western Larch, Lodgepole Pine, Balsam, Western, Mountain Hemlock and Yellow Cedar.

Western red cedar will be favoured where ecologically suited to the site. The long-term prospects for the marketing of western red cedar continue to be very promising as few areas in the world grow it. Various species of pine and spruce are widely cultivated commercially throughout the world. Even western North America’s own Douglas-fir is grown on most continents now. Western red cedar is rarely grown elsewhere and commands very high prices on the open log market.

On sites susceptible to root disease, more tolerant species such as cedar, white pine, lodgepole pine, and western larch will be planted to lower the risk of
infection and mortality from root rot. These stands will be managed to include hardwoods as a component (less than 20% of crop trees) of the free growing stand. Mixed-wood prescriptions that utilize combinations of root disease tolerant conifers and hardwoods (birch, aspen, and cottonwood) are an ecologically sound method of managing root disease.

Once a cutblock has met regeneration delay the subsequent establishment and growth of the regenerated stand will be monitored over a two to fifteen year period by silviculture surveys until a free growing status has been achieved.

During the review of the draft version of Management Plan #3, question was raised about the validity of the species proportions listed above. Specifically, the Ministry of Forests and Range noted that historically, planting was dominated by spruce with less than 20% cedar. The amount of cedar was low in the early years of the MP #2 period. In the latter half of the MP #2 period, RCFC made a decision to increase the proportion of cedar planted. Because of the inherent delays in making prescriptions and ordering seedlings, these changes are being felt only recently. A survey of recent (2006 and 2007) Summary of Artificial Reforestation on TFL 56 indicates that the proportions of species planted are Cw 42%, Sx 35%, Fd 12%, and others 33%. The overall reforestation on TFL 56 since 1964 has been 18% Cw, 58% Sx, 19% Fd and 5% other. The species proportions represented in sowing requests will “catch up” as the SP’s are implemented.

Seed Supply. RCFC will continue to maintain a sufficient seed inventory to supply the projected seedling requirements for a ten-year period. The following Table 9 illustrates that this objective has been met for most species. This will provide adequate seed to cover fluctuations in cone crops. Seed year periodicity varies from two to eight years depending on the species.

The seed inventory as of February 2008 is summarized in Table 15.

<table>
<thead>
<tr>
<th>Species</th>
<th>Potential Seedlings</th>
<th>Years of Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bl</td>
<td>120,100</td>
<td>3.5</td>
</tr>
<tr>
<td>Cw</td>
<td>1,816,000</td>
<td>10 +</td>
</tr>
<tr>
<td>Fdi</td>
<td>1,184,400</td>
<td>10 +</td>
</tr>
<tr>
<td>Hw</td>
<td>191,600</td>
<td>10 +</td>
</tr>
<tr>
<td>Lw</td>
<td>50,700</td>
<td>10</td>
</tr>
<tr>
<td>Pli</td>
<td>87,000</td>
<td>10</td>
</tr>
<tr>
<td>Pw</td>
<td>537,300</td>
<td>10</td>
</tr>
<tr>
<td>Sx</td>
<td>5,709,900</td>
<td>10 +</td>
</tr>
</tbody>
</table>

This inventory will be maintained by RCFC through cone collections or seed purchases. Cone collections will be made within the seed zone by elevation band. Cone crops will be monitored annually for size and seed viability prior to any collection being made. Cones will be collected from the best phenotypes within a stand. Collections will be made in accordance with the Chief Forester’s Standards for Seed Use.

The Ministry of Forests and Range has established seed orchards to produce genetically improved seed (Known as “A” seed). RCFC will purchase all the
available “A” seed that is appropriate for planting on the TFL area. The proportion that has been used in the recent past is indicated in the table below.

### Table 9  Use of Class “A” Genetically Improved Seed.

<table>
<thead>
<tr>
<th>Sowing Year</th>
<th>% Class A Seed by Species</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sx</td>
</tr>
<tr>
<td>2004</td>
<td>100.0%</td>
</tr>
<tr>
<td>2005</td>
<td>100.0%</td>
</tr>
<tr>
<td>2006</td>
<td>100.0%</td>
</tr>
<tr>
<td>2007</td>
<td>90.0%</td>
</tr>
<tr>
<td>2008</td>
<td>41.5%</td>
</tr>
</tbody>
</table>

**Seedlings.** Coniferous seedlings are grown under contract by private nurseries. Styro-block container grown seedlings are used. Generally the preferred stock types are PSB415 and PSB412; PSB410 are used on cold or shallow soils.

**Silviculture Surveys.** Silviculture surveys will be done at various stages of the stand establishment phase. This may take up to fifteen (twenty at high elevations) years after harvesting. The results of these surveys are used to assess the status and stocking of regeneration as well as progress towards completing basic silviculture obligations. The surveys are also used to plan any additional silviculture treatments to ensure that basic silviculture is achieved.

The status and survey results are entered into the silviculture record management system (PhoenixPro). Two key progress points will be reported to the Ministry of Forests (RESULTS):

1. Attainment of regeneration delay, and
2. Achievement of free growing.

The types of silviculture surveys are:

- **Plantability Survey**
  These surveys will be carried out on cutblocks within six months after harvesting. The results are used to assess the need for site preparation and to confirm or modify the planting prescription (Normally at one plot per 1-2 hectares).

- **Regeneration/Survival Survey**
  An initial survey is done at the time of planting, including natural regeneration, to assess regeneration delay (Normally at one plot per 1-2 hectares.).

  Walk-thru surveys are carried out on all plantations after one and two growing seasons. The results are used to assess the survival and condition of the planted seedlings and to determine if re-planting or brushing treatment is necessary. (Normally only six plots per cutblock.)
The average regen delay for all blocks on which regen delay has been met is 2.2 years on the TFL.

After the third and fifth growing seasons stocking surveys are carried out to assess regeneration performance and to prescribe any follow-up silviculture treatments or any enhanced silviculture opportunities. (Normally at one plot per 1-2 hectares.)

- **Brushing Survey**

  Brushing surveys are not normally required as information on brush conditions is collected in conjunction with other surveys. However, any block that has been prescribed for brushing or anticipated to need brushing will be assessed in the spring, prior to brushing, to confirm the need for treatment. This is normally an informal visual confirmation.

- **Free Growing Survey**

  This is the final survey used to assess the free-growing status of a cutblock. In TFL 56 the average plantation reaches free-growing in 11.8 years. If free-growing standards have been met, the basic silviculture obligations have been completed. If not, further silviculture treatments may be prescribed. The results of free-growing surveys will be reported to the Ministry of Forests within six months of completion. A summary of free-growing status will be included in the TFL annual report.

- **Pre-Stand Tending Survey**

  If a free-growing, or other, survey indicates an opportunity for any enhanced silviculture treatment(s) a pre-stand tending / forest health survey may be carried out to collect the information required to prepare a Stand Management Prescription (SMP). The SMP will define the objectives of the required treatment.

**Brushing.** The purpose of brushing treatment is to control, temporarily, the growth of woody or herbaceous vegetation that is competing with the preferred crop trees. During the period of stand establishment, brushing treatments will be justified to ensure adequate survival and growth. The strategy for brush control will emphasize early identification of possible competition and timely application of treatment. This starts with identification of potential brush competition in the SP.

In order to reduce the potential need for brushing, other practices that may be employed are:

- Identification and monitoring of potential brush problem sites;
- Immediate site preparation and planting;
- Planting of large, sturdy seedlings; and
- Experimentation with vegetation management techniques and timing.

All cutblocks potentially requiring brushing treatment will be assessed several times during the first three growing seasons after stand establishment. When a survey or other assessment determines that a cutblock requires brushing,
enough data is collected to enable the prescribing of preferred and alternative brushing treatments.

Brushing treatments near riparian areas will require careful consideration. On these sites the regrowth of hardwoods and woody brush species after harvesting can be considered as part of the natural vegetative diversity that occurs during the revegetation phase. The vegetation complexes also serve as preferred habitat and browse for wildlife, particularly bears, moose and birds, and provide shade for fish streams.

Brushing treatments commonly used include:

- Manual cutting with hand tools.
- Mechanical: motor-manual cutting (e.g., brush saws).
- Aerial and ground foliar, or individual stem application of herbicides.

RCFC’s preference is to use manual or mechanical treatments before selecting a herbicide treatment. Community values require minimum usage of chemical applications. RCFC accepts these values and will endeavour to undertake reforestation activities in such a manner that chemical usage is minimized. However, the company recognizes that the judicious use of herbicides has a role in vegetation management and sometimes is the most appropriate treatment option.

5.4.2 Enhanced Silviculture

Enhanced silviculture refers to stand treatments that maintain or increase future stand value by increasing the volume to be harvested and/or the quality of wood to be harvested beyond that achieved through basic silviculture. Potential treatments include juvenile spacing, pruning, and fertilization. These are optional treatments and are not required by law or regulation.

RCFC is completing a strategic silviculture plan. The plan includes:

- Definitions of wood quality for various species.
- Wood quality objectives related to possible end-products.
- Possible treatments to achieve the wood quality objectives.

Potential treatments are listed below.

Precommercial Thinning. Precommercial thinning may be prescribed for young, excessively stocked stands to select crop trees for release, optimize preferred species composition, meet specific product quality objectives, and provide future opportunities for commercial thinning. Stands will be assessed for precommercial thinning once they have reached sufficient age and height. Selection will be based on forest health considerations, site productivity, and density.

Stand Management Prescriptions are prepared for the selected stands. They include the proposed juvenile spacing, as well as associated, or separate, pruning and/or fertilization treatments. They also accommodate wildlife habitat and biodiversity objectives, and ensure that activities within riparian management
areas are prescribed in accordance with the *Forest Planning and Practices Regulation*.

**Pruning.** Pruning for value is carried out to increase the amount of high quality, clear logs recovered when harvested. Pathological pruning of white pine (to control blister rust infection) may be done along with value pruning.

**Fertilization.** To date there has been no fertilization of any second growth stands on TFL 56. Fertilization treatments may be prescribed to increase growth rates and produce merchantable-sized stands sooner. Where FIA funding permits, operational fertilization may be scheduled in conjunction with other enhanced silviculture treatments or as a separate treatment. Additional opportunities for enhanced silviculture may arise because of funding from FIA or other sources. RCFC will explore all possibilities related to enhanced silviculture given financial support from FIA or other sources.

**White Pine Management.** Western white pine (*Pinus monticola*) is a high-value commercial conifer species. Its silvical characteristics, high growth rates and potential for desirable products make it an attractive regeneration species. White pine is susceptible to white pine blister rust (*Cronartium ribicola*) infection and this may limit its potential to reach merchantable size. RCFC’s goal is to increase the amount of white pine regenerated and managed on the TFL. Ministry of Forests and Range and Forestry Canada are engaged in a white pine tree improvement program that involves the breeding and testing of superior rust-resistant white pine.

RCFC has purchased rust resistant white pine seed from *The Inland Empire Tree Improvement Cooperative* (IETIC) since 1995 and has been planting seedlings grown from this seed on an operational basis.

RCFC currently has two ongoing rust resistant white pine growth trials. One trial shows white pine outgrowing the next best performing species (Spruce) by 290% after eight growing seasons. The second trial has it outgrowing the next species by 450% after seven growing seasons. RCFC has been monitoring survivorship of white pine over an eight-year period. Survival for white pine has been around 85% compared to 93% for spruce, 90% of Douglas-fir and 63% for western red cedar (primarily due to browse). RCFC will continue to monitor the survival of white pine and compare it to other species planted on the TFL.

**Management Options.** RCFC is looking at a number of management options to optimize quality objectives over the long-term while maintaining a healthy quantity of timber. Some of these options include: commercial thinning; single tree selection; seed tree silviculture systems; leaving advanced regeneration in cutblocks; longer rotation blocks and managing low site stands.
5.5 Forest Health

A variety of insects and diseases occur naturally in the forests of TFL 56 (Table 11). The incidence and level of endemic activity is often higher in old growth stands. Periodic outbreaks have been a concern but have not yet resulted in major volume losses. For example, spruce bark beetle (*Dendroctonus rufipennis*) attack of mature spruce stands has been problematic. The Striped Ambrosia Beetle (*Trypodendron lineatum*) was detected in the TFL and logsort in 2006. Mass trapping has proven to work well in the logsort while an effort to remove winter log decks from the bush will minimize losses to the economic value of species affected by the beetle. Hemlock looper (*Lambdina fiscellaria lugubrosa*) periodically reaches epidemic levels in the area. The last epidemic was in the 2001 to 2004 period. This outbreak saw biological pesticide spraying by Ministry of Forests and Range to control the epidemic. The epidemic before that was the 1991 to 1994 period. The hemlock looper has recently seen a ten-year cycle and will most likely occur around 2011. Root disease, in particular *Armillaria ostoyae*, is widespread throughout the district and is having an influence on operational practices.

**Table 10** Common Pests and Diseases of TFL 56

<table>
<thead>
<tr>
<th>Type</th>
<th>Pest</th>
<th>Susceptible tree species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bark beetles and borers</td>
<td>Spruce bark beetle (<em>Dendroctonus rufipennis</em>)</td>
<td>Sx</td>
</tr>
<tr>
<td></td>
<td>Douglas-fir beetle (<em>Dendroctonus pseudotsugae</em>)</td>
<td>Fd</td>
</tr>
<tr>
<td></td>
<td>Western balsam bark beetle (<em>Dryocoetus confusus</em>)</td>
<td>Bl</td>
</tr>
<tr>
<td></td>
<td>Striped Ambrosia beetle (<em>Trypodendron lineatum</em>)</td>
<td>Fd,Hw,Cw</td>
</tr>
<tr>
<td>Tissue feeders</td>
<td>Spruce terminal weevil (<em>Pissodes strobi</em>)</td>
<td>Sx</td>
</tr>
<tr>
<td>Defoliators</td>
<td>Forest tent caterpillar (<em>Malacosoma disaria</em>)</td>
<td>At Act</td>
</tr>
<tr>
<td></td>
<td>Hemlock sawfly (<em>Neodiprion tsugae</em>)</td>
<td>Hw</td>
</tr>
<tr>
<td></td>
<td>Western blackheaded budworm (<em>Acleris gloverana</em>)</td>
<td>Hw,Fd,Bl,Sx</td>
</tr>
<tr>
<td></td>
<td>Spruce budworm (<em>Choristoneura biennis</em>)</td>
<td>Sx</td>
</tr>
<tr>
<td></td>
<td>Western hemlock looper (<em>Lambdina fiscellaria lugubrosa</em>)</td>
<td>Hw,Cw,Fd</td>
</tr>
<tr>
<td></td>
<td>Black army cutworm (<em>Actibea fenica</em>)</td>
<td>Seedlings</td>
</tr>
<tr>
<td>Diseases</td>
<td>Laminated root rot (<em>Phellinus weirii</em>)</td>
<td>Fd,Cw,Hw</td>
</tr>
<tr>
<td>Root diseases</td>
<td>Armillaria root disease (<em>Armillaria ostoyae</em>)</td>
<td>Conifers,Fd,PI</td>
</tr>
<tr>
<td></td>
<td>Black stain root disease (<em>Leptographium wageneri</em>)</td>
<td>Fd,PI</td>
</tr>
<tr>
<td></td>
<td>Rhizina root disease (<em>Rhizina undulata</em>)</td>
<td>Seedlings</td>
</tr>
<tr>
<td>Stem rusts</td>
<td>White pine blister rust (<em>Cronartium ribicola</em>)</td>
<td>Pw</td>
</tr>
<tr>
<td>Others</td>
<td>Pine needlecast (<em>Lophodermella concolor</em>)</td>
<td>Pl</td>
</tr>
</tbody>
</table>

In the regenerated forest, there has been no noticeable increase in pest or disease activity with the exception of “voles”. In 1999, voles damaged several plantations. The damage varied, but two plantations were rendered “not satisfactorily restocked” (NSR). Vole activity subsided somewhat in 2000. White pine blister rust (*Cronartium ribicola*) continues to infect western white pine regeneration and is the most notable pathogen.
Black army cutworm (*Actibia fenica*) has caused periodic mortality in new plantations. Spruce terminal weevil (*Pissodes strobi*) is a potential problem in spruce plantations.

To ensure that forest disease activity is detected early in any potential cycle, the following measures are taken:

- Conduct an annual flight over the TFL to assess windthrow and pest conditions.
- Cooperate with government pest specialists to ensure pooling of knowledge and exchange of data.
- Closely monitor areas of known disease problems. Use the results to prepare action plans and treatments.
- Conduct surveys of infected areas to monitor pest activity, prepare control plans, or to prepare silviculture prescriptions. More intensive ground surveys will be conducted to evaluate levels of known diseases such as *Armillaria ostoyae* and spruce bark beetle.

It is not possible, nor is it desirable, to eradicate pests from the forest. The strategy will be to attempt to maintain pests at endemic levels by preventing the conditions that favour build-up and spread. Measures to prevent epidemic conditions, or control epidemics if they occur will include:

- Prompt harvesting of windthrow.
- Salvage harvesting of bark beetle or other heavily damaged stands.
- Use of pheromone attractants
- Reforestation with mixed species
- Stump removal in root rot areas.
- Spacing and density control in managed stands.
- In the case of white pine blister rust, resistant tree seed will be used in reforestation efforts, and pruning will be completed on selected juvenile stands.

RCFC will continue to monitor development of new control techniques and utilize them if appropriate. Any control techniques will be conducted in accordance with a plan prepared by RCFC. Ministry of Environment personnel will be provided an opportunity to review the plan when significant impacts to other resources are possible.

### 5.5.1 Non Recoverable Losses

The damage caused by fire, insects, disease, and other agents combine to cause a loss in harvestable volume. Losses of individual trees, or small groups of trees, are accounted for in the growth estimates used in the timber supply analysis.

Larger groups of trees or catastrophic losses must be estimated. As well, portions of these losses can be salvaged and are therefore not “non
recoverable”. It is only the portion that cannot be salvaged that need be estimated. Based upon a comprehensive review, the losses were estimated at 938m$^3$ per year. Further details are outlined in Appendix 9A.

5.6 Fire Protection

RCFC will continue necessary operations to protect the licence area from fire damage. The goal is to minimize damage from fire in the forested landbase and to maximize the timber salvage from fire damaged stands. Historically, the licence area has experienced a relatively low frequency of wildfires. Most fires that have occurred have resulted from lightning strikes. The fire prevention program consists of fire prevention, detection, and control.

Fire suppression and prevention measures will be done in accordance with the Wildfire Regulation (BC Reg 38/2005). A high standard of fire fighting organization will be maintained during the fire season.

5.6.1 Prevention

Fire protection awareness and preparedness will be reflected in all forest activities carried out during the fire season.

5.6.2 Fire Pre-Organizational Plan

RCFC will update their fire plan content yearly to update contact information and equipment and supply lists. RCFC will also provide contact details by April 1 each year in accordance with the Wildfire Regulation.

5.6.3 Fire Detection

The goal is to detect all wildfires as soon as possible, and control wildfires by 10:00 am of the day following detection.

During fire season, several functions are carried out to enable early detection and control of fires. Fire weather stations operated by the Ministry of Forests and Range are used to calculate fire weather indices. When the fire danger rating reaches high, regular contact is kept with the Ministry of Forests fire officer. The Ministry of Forests and Range will conduct aerial patrols after lightning events or when the fire danger rises to extreme. Forest closure and access restrictions may be applied.
6.0 Non-Timber Resource Management

6.1 Range

There is no range use in or near TFL 56. We do not anticipate any range use during the Management Plan #4 period.

6.2 Recreation

Many outdoor recreational activities are carried out on TFL 56. The types of activities are related to the scenic mountains, glaciers, rivers, and lakes within or adjacent to the TFL. The scenery is outstanding and is attracting more recreationists every year.

The increase likely has several factors including:

- Increasing pressure on the adjacent national parks;
- Additional road access within the TFL;
- Few restrictions on backcountry use when compared to neighbouring national parks;
- Improvement of some facilities (Keystone cabin and road, Goldstream canoe route); and
- Huge increases in snowmobile tourists in the Revelstoke area.

RCFC has completed Recreation Opportunities Spectrum and Recreation Features Inventory components of the recreation inventory. As well, a Recreation Use Inventory was completed for the Revelstoke portion of the Columbia Forest District. These inventories, along with our knowledge of the TFL landbase, allow us to see where the features are and where recreational use is taking place.

Current commercial operations in the TFL are listed in Table 12. Non-commercial recreational activities are listed in Table 13.

Table 11 Commercial Recreation Activities on TFL 56.

<table>
<thead>
<tr>
<th>Company</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian Mountain Holidays</td>
<td>CMH conducts helicopter skiing and helicopter-access hiking and climbing from two lodges in the Goldstream Valley (Gothics and Adamants Lodges).</td>
</tr>
<tr>
<td>Selkirk Tangiers Heli Skiing</td>
<td>Selkirk Tangiers conducts helicopter skiing in the southern portion of TFL 56. Clients stay at the firm’s lodge in Revelstoke.</td>
</tr>
<tr>
<td>Selkirk Mountain Experience</td>
<td>SME is a fly-in ski touring lodge located on the Durrand Glacier at the head of the Carnes Creek drainage. They have a satellite hut in the headwaters of Moloch Creek located in the back of the Downie Valley.</td>
</tr>
<tr>
<td>Monashee Outfitters</td>
<td>This firm conducts guided hunting and fishing in the Goldstream Valley.</td>
</tr>
<tr>
<td>Selkirk Big game Outfitters</td>
<td>This firm conducts guided hunting and nature viewing in the Downie Valley and Keystone area.</td>
</tr>
<tr>
<td>Downie RV Resort</td>
<td>Provides accommodation and has provided some guided snowmobiling.</td>
</tr>
</tbody>
</table>
Figure 32. Helicopter Skiing.

*CMH Gothics’ Columbia face ski run descends through several plantations. This is CP 726-300.*

Table 12  Non-Commercial Recreation Activities on TFL 56.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Location and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing</td>
<td>Most fishing takes place on Lake Revelstoke. The rivers, streams, and small lakes are fished very lightly.</td>
</tr>
<tr>
<td>Hunting</td>
<td>Big game hunting (deer, moose, grizzly bear, black bear, and cougar) takes place. A small amount of grouse and migratory bird hunting also takes place.</td>
</tr>
<tr>
<td>Hiking</td>
<td>Hiking opportunities are limited by a lack of developed trails and routes. The Keystone-Standard basin trail is the most travelled hiking route in the TFL and is becoming well known.</td>
</tr>
<tr>
<td>Mountaineering</td>
<td>Mountaineering use is light although many impressive peaks lie within TFL 56.</td>
</tr>
<tr>
<td>Canoeing and Kayaking</td>
<td>The Ministry of Forests maintains a canoe launch and take-out on a segment of the Goldstream River. There is also unorganized use of other sections of the Goldstream River and Downie Creek.</td>
</tr>
<tr>
<td>Wildlife Viewing</td>
<td>The riparian habitat and avalanche tracks in the Downie, Goldstream, and Sorcerer valleys afford excellent big game viewing opportunities.</td>
</tr>
<tr>
<td>Sightseeing</td>
<td>Views are excellent from the logging roads and highway 23. Sightseeing use is still quite light.</td>
</tr>
<tr>
<td>Mountain Biking</td>
<td>Mountain biking is popular on the Keystone Standard Basin trail. Mountain biking elsewhere in the TFL is extremely light.</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>Snowmobiling has increased dramatically over the last decade. The Keystone Standard Basin area is now very heavily used. Caribou basin, at the head of Brewster Creek, is now popular too. Interactions with caribou are a concern in both these areas.</td>
</tr>
<tr>
<td>Backcountry Skiing</td>
<td>Excellent backcountry ski opportunities exist although use is still light.</td>
</tr>
<tr>
<td>Site</td>
<td>Site Objectives</td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Keystone Standard Basin trail and cabin</strong></td>
<td><strong>TRAIL:</strong> The objectives are to manage the Keystone Standard Basin Trail for a semi-primitive non-motorized recreation experience. The trail will be maintained and the sub alpine/alpine flora and fauna will be protected. Opportunities for hiking, viewing, mountain biking, and horseback riding will be provided. Very rough road access to the trailhead will be maintained for four-wheel drive vehicles June to October. The objectives are to manage the Standard Cabin recreation site for a semi-primitive non-motorized recreation experience from June 15 to October 15 of each year, and a semi-primitive motorized recreation experience from October 16 to June 14 of each year. <strong>CABIN:</strong> The Standard Cabin will be maintained and opportunities will be available for overnight use associated with backcountry hiking and skiing. Access to the site is via trail in the snow free months, which will be maintained by the Ministry of Forests and Range. <strong>BASIN:</strong> The objectives are to manage the Keystone Standard Basin recreation site for a semi-primitive non-motorized recreation experience from June 15 to October 15 of each year, and a semi-primitive motorized recreation experience from October 16 to June 14 of each year. The sub alpine/alpine flora and fauna will be protected. Opportunities will be available for viewing, hiking, ski touring and camping. Access to the site is via Ministry of Forests trail.</td>
</tr>
<tr>
<td><strong>Goldstream River Canoe Route</strong></td>
<td>The objectives are to manage the Goldstream Canoe recreation site for a natural roaded recreation experience. The riparian areas of the Goldstream River along the canoe route corridor will be retained. Opportunities for viewing and non-motorized water craft will be available. Rough road access to the site will be maintained for two wheel drive vehicles from May to October.</td>
</tr>
<tr>
<td><strong>Wadey (Laform Crk) Campsite</strong></td>
<td>This drive-in campsite is on Lake Revelstoke just South of TFL 56. It provides unserviced campsites and a boat launch</td>
</tr>
<tr>
<td><strong>Carnes Creek Campsite</strong></td>
<td>This drive-in campsite is on Lake Revelstoke just South of TFL 56. It provides unserviced campsites and a boat launch</td>
</tr>
</tbody>
</table>
Figure 33. Keystone Cabin.  
RCFC has participated in repairs and maintenance on this backcountry cabin.

Table 14 Commercial or Provincial Parks or Campgrounds Within or Near TFL 56.

<table>
<thead>
<tr>
<th>Site</th>
<th>Activity and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downie RV Resort</td>
<td>This commercial enterprise provides tenting and RV sites as well as long term RV sites. Snowmobile tourism is also based here.</td>
</tr>
<tr>
<td>Martha Creek Provincial Park</td>
<td>This campsite is open in the summer and provides lake-based recreation opportunities.</td>
</tr>
<tr>
<td>MTCA Downie Loop Recreation Site</td>
<td>This campsite is located on the northern shore in the Downie Loop. It had been closed for a number of years and has now reopened and sees increasing use.</td>
</tr>
</tbody>
</table>

To manage the recreational resources on or adjacent to TFL 56, RCFC will continue to:

- Maintain access to important recreational areas and trail heads.
- Work with the Ministry of Forest and Range to maintain or enhance existing recreation sites and trails, and to identify and manage potential recreation sites and trails.
- Work with commercial recreation firms to maintain commercial recreation opportunities.

6.3 Visual

The TFL area is extremely scenic with high mountains, glaciers, waterfalls, forested slopes, and other elements combining to provide superlative landscapes (Figure 34). Much of the harvestable timber lies on slopes that are visible from valley bottom logging roads or Highway 23 and therefore harvesting can easily impact the scenic quality.
Although the TFL is very scenic, no areas have been designated as “known scenic areas” under the FRPA. As well, the Revelstoke Higher Level Plan does not recommend that any TFL 56 areas be designated as “known scenic areas”. Visual Quality Objectives have not been set for the TFL area.

The former MAC Plan did specify some backcountry visual design guidelines and RCFC will refer to these for. As well, RCFC will continue to engineer new harvesting areas with basic visual principles in mind. These principles involve shape and configuration of cutblocks but not the overall percentage of viewscapes that may be modified.

The various plan guidelines that RCFC will apply to TFL 56 are shown in Table 16.
Table 15 Visual Management Guidelines from Applicable Plans.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC Plan</td>
<td><strong>Feature:</strong> Campsites, cabins, historic sites&lt;br&gt;<strong>Definition:</strong> Forest Service campsites, named historic sites&lt;br&gt;<strong>Design Intent:</strong> Resource exploration and development should minimize potential impacts to the immediate surroundings of the site.&lt;br&gt;<strong>Visual Design:</strong> Any logging within 200m of the site should be designed such that modification may be discernibly but not clearly evident from the site.</td>
</tr>
<tr>
<td></td>
<td><strong>Feature:</strong> Lodges, Commercial cabins, Camps&lt;br&gt;<strong>Definition:</strong> Permanent or semi-permanent camps or structures associated with commercial tourism tenures, without highway access.&lt;br&gt;<strong>Design Intent:</strong> Resource exploration and development should minimize potential impacts to the immediate surroundings of the site.&lt;br&gt;<strong>Visual Design:</strong> 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.</td>
</tr>
<tr>
<td></td>
<td><strong>Feature:</strong> Tenured or Licensed use areas&lt;br&gt;<strong>Definition:</strong> Areas tenured for commercial recreation under the Lands Act&lt;br&gt;<strong>Design Intent:</strong> 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.&lt;br&gt;<strong>Visual Design:</strong> Resource exploration and development in tenured use areas should show evidence of good visual design.&lt;br&gt;Statements of interest and concern are to identify areas requiring particular design consideration.</td>
</tr>
<tr>
<td></td>
<td><strong>Feature:</strong> Backcountry lakes&lt;br&gt;<strong>Definition:</strong> Lakes, 2 ha or larger, with no road or highway access within 500m.&lt;br&gt;<strong>Design Intent:</strong> Backcountry lakes should be managed to maintain an unroaded condition (ROS Semi-Primitive Non Motorized).&lt;br&gt;<strong>Visual Design:</strong> Any logging within 200m of the lake should be designed such that modification may be discernibly but not clearly evident from the lake.</td>
</tr>
</tbody>
</table>

In addition to the guidelines stated in Table 16 above, RCFC will use visual management techniques in designing harvesting plans in areas within the Adamants lodge and Gothics lodge viewscapes.

6.4 Aquatic Resources

Aquatic resources include fisheries and other resources associated with the lakes, streams, and wetlands of TFL 56. TFL 56 is bordered by the Lake Revelstoke reservoir, includes two major stream valleys, many smaller streams and several small alpine lakes. RCFC has completed overview stream and wetland classification of the entire TFL (1:20,000 maps) and has also completed field-based surveys of most of the streams within the TFL area. The following documents contain the information:

1. *Stage One Stream Inventory Report for Revelstoke Community Forest Corporation T.F.L. #56* by Bruce Runciman, Silvatech Consulting Limited, not dated.
These reports are supplemented by biologists’ reports on individual streams when necessitated by nearby forestry activities. Fisheries are not the only values associated with riparian areas. For example, wetlands provide important habitat for some species of big game (i.e. moose) and many species of birds, small mammals, reptiles, and insects. The streams and wetlands all flow into Lake Revelstoke, and eventually through the turbines of the Revelstoke Dam.

RCFC has the following objectives relating to streams, lakes, and wetlands:

- Maintain and protect the productive capacity of fish habitat,
- Maintain streamside vegetation and the integrity of stream channels,
- Prevent unnatural stream bank erosion, sedimentation, and introduction of woody debris,
- Maintain the integrity of wetlands.

The objectives will be achieved by completing necessary riparian assessments and adhering to FRPA legislation and regulations. During planning and fieldwork on areas where watercourses exist, the following procedures are followed:

1. The correct classification for each stream, lake, or wetland will be determined (i.e. S1 to S6, L1 to L5, and W1 to W5).
2. Harvesting will be designed to protect the riparian reserve and management area.
3. Operating “windows” for in-stream work (i.e. for bridges and culverts) will be determined in consultation with a Qualified Registered Professional (QRP).
4. Debris deposited in streams as a result of harvesting operations will be removed following harvesting.

RCFC will determine correct classification of each stream, lake, or wetland by using the Forest Practices Code Guidebook or a Qualified Registered Professional (QRP).

### 6.5 Wildlife and Biological Diversity

The TFL 56 area is rich in both the presence of individual wildlife species and in biological diversity. These resources are important to licensed users such as trappers and guide-outfitters as well as the general public who might enjoy viewing or simply knowing that these resources are present.

RCFC has refined their old landscape unit plan (MFRA’s) by using spatial OGMA’s, Caribou Reserves (status quo and incremental) and % constraints for mature + old seral objectives. Retention for ungulate winter range is no longer required. RCFC plans on developing an ongoing retention strategy that incorporates required reserves with operational limitations and desirable wildlife reserves.

As well as retention of mature forest, the patch size distribution, maintenance of wildlife trees, and access management are important factors in wildlife and biodiversity management.
RCFC will strive to achieve the patch size targets specified in the *Biodiversity Guidebook* although these may not be possible to achieve throughout RCFC’s landscape. The patch size targets for natural disturbance type 1 (NDT 1)\(^2\) are as indicated in the following table.

**Table 16** Recommended Distribution of Patch Sizes (Harvest Units and Leave Areas)

<table>
<thead>
<tr>
<th>Patch Size</th>
<th>Size Range (ha)</th>
<th>NDT 1 % Of Young Seral Area</th>
<th>NDT 3 (with Douglas-fir) % Of Young Seral Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>(0-40 ha)</td>
<td>30-40% of area &lt;20 yrs</td>
<td>20-30% of area &lt;20 yrs</td>
</tr>
<tr>
<td>Medium</td>
<td>(40-80 ha)</td>
<td>30-40% of area &lt;20 yrs</td>
<td>25-40% of area &lt;20 yrs</td>
</tr>
<tr>
<td>Large</td>
<td>(80-250 ha)</td>
<td>20-40% of area &lt;20 yrs</td>
<td>30-50% of area &lt;20 yrs</td>
</tr>
</tbody>
</table>

The patch size targets for larger patches are difficult to meet on RCFC’s landscape for two main reasons. First, the forest is naturally fragmented by avalanche paths, gullies, and other terrain features. Second, the forested portions of the valleys are narrow meaning that small terrain features easily fragment the potentially larger patches. Third, the early harvesting was done in small patches, and the pattern is difficult to change now without transgressing other rules such as mature forest cover requirements. Although there are difficulties, RCFC will strive to meet the patch size targets where possible to do so.

Wildlife tree retention areas will be maintained in compliance with the FPPR sections 66 and 67. On a cutblock basis, 3.5% of the area will relate to the block while the total area for cutblocks harvested in a 12 month period commencing April 1 will be 7%. These wildlife tree patches will be designed to maximize effectiveness for wildlife while being practical from a harvesting perspective.

RCFC recognizes that access management can be a very important tool in maintenance of wildlife populations. Access management is discussed in section 5.3.4.

---

\(^2\) NDT 1 ecosystems are those with rare stand-initiating events. Historically, these forest ecosystems were usually uneven-aged or multi-storied even-aged, with regeneration occurring in gaps created by the death of individual trees or small patches of trees. When disturbances such as wind, fire, and landslides occurred, they were generally small and resulted in irregular edge configurations and landscape patterns.

NDT 3 ecosystems are those with frequent stand-initiating events. Historically, these forest ecosystems experienced frequent wildfires that ranged in size from small spot fires to conflagrations covering tens of thousands of hectares.
7.0 Consultation With the Public and Other Resource Users

The public have a special stake in TFL 56 and the Revelstoke Community Forest Corporation. RCFC was born out of a desire by the people of Revelstoke to have more influence in forest management decisions in the Revelstoke area.

RCFC has continued to provide consultation opportunities to the public as part of the regular processes of running the TFL. These may include:

- An annual public meeting;
- An annual report sent to each household in Revelstoke;
- Frequent advertisements in the local newspaper advising the public of operations and achievements; and
- An “open door” policy for public consultation.

As well, RCFC has provided the required public consultation opportunities for this Management Plan process.

7.1 Non-Timber Tenure Holders

In TFL 56, non-timber tenure holders include guide-outfitters, trappers, commercial recreation operators, and water users.

RCFC’s goal is to continue meaningful consultation with these tenure holders.

RCFC will also provide additional consultation in the following circumstances:

- For proposed SP’s in the CMH Adamants Lodge viewscape (foreground and middle ground), RCFC will consult with CMH on visual designs.
- For timing of springtime harvesting in the Downie watershed, RCFC will consult with the guide-outfitter to not adversely affect his springtime operations.
- For other situations brought up by other licensed non-timber tenure holders.

7.2 First Nations

RCFC must provide opportunities for information sharing with certain First Nations people who may wish to carry out traditional activities with the licence area (see Appendix 5bii for First Nations Referral List). Although the present and historic use of the TFL 56 area by First Nations people is very low, RCFC does share information with First Nations groups as follows:

- Letters, emails and follow-up letters inviting affected First Nations groups (see Appendix 5bii) to view and comment on FSP’s, Management Plans, and yearly planned development. Affected First Nation groups are given a chance to comment on planned harvesting
blocks and roads prior to the approval of Cutting Permits or Road Permits.

The list of First Nations groups who RCFC shares information with is provided in Appendix 5.

7.3 Public Review

An open house, stakeholder notifications and advertisements have been conducted to give the public and interested parties ample time to review and comment on this management plan. The only comments received for this management plan were from MFR regional staff and Parks Canada (see Appendix 11 for communications).
8.0 Impact Summary of MP Implementation

The impact of the implementation of this management plan will be moderate. Additional area constraints have been placed on the landbase through the GAR Order as well as fiscal constraints such as harvesting limits on pulp and aerial harvesting levels. Impacts are placed in four categories below; annual cut levels, operation costs, employment, as well as biodiversity and habitat.

Annual Cut Levels. The annual cut levels have dropped 12% from Management Plan #3. This is primarily due to the addition of incremental caribou habitat, reducing the operable harvest landbase, limiting aerial harvesting and reduced growing stock at the start of the planning horizon.

RCFC will have to continue to maximize the harvestable landbase and carefully balance expenses with expected revenues. As markets change, RCFC will shift the harvest plans accordingly. If markets are high for RCFC’s products, then RCFC harvests in more expensive operating areas. Conversely, if log markets are poor, RCFC withdraws to lower cost areas. This strategy allows the company to develop high cost or low revenue areas that previously would have been avoided.

Operating Costs. The impact on operating costs will be significant. Costs remain high and are likely to climb higher with fuel costs and fewer operators in the area. The cost of doing business in the interior wetbelt is high and the costs are often not recognized in the appraisal system. A decreased annual cut exasperated by the non-declining BCTS cut will greatly reduce income to RCFC and may jeopardize RCFC’s log sort operations.

Employment. Employment levels in TFL 56 are dependent on annual cut levels and methods of harvest. RCFC is looking to find alternative systems from helicopter harvesting to maintain increased employment. Employment rates will likely decrease slightly from current rates.

Biodiversity and Habitat. Spatial OGMA’s, incremental and status quo caribou habitat reserves and biodiversity requirements have been described elsewhere in this plan. The addition of incremental habitat has increased the amount of the landbase reserved for wildlife. The impact of this plan should provide wildlife managers with an increased assurance that the biological needs are being met.
9.0 Employment and Economic Opportunities

RCFC, as the holder of a TFL with an AAC of 88,000 m³ per year, can have a significant impact on employment and economic opportunities in the vicinity of TFL 56. RCFC employs a small planning and administrative staff, and contracts out services including engineering, layout, road building, timber harvesting, and sort yard operation.

![Figure 35. RCFC Log Yard.](image)

RCFC does operate a log yard where logs are scaled, sorted, and sold for a variety of uses. As well, 50% of RCFC’s sawlogs are automatically sold to RCFC’s industry partners who do have mills in Revelstoke and typically use their entire apportionment from RCFC in those mills or trade for and equivalent volume.

RCFC employs directly only six full-time persons. However many more people are employed directly on a contract basis and indirectly through economic spin-offs. The table below summarizes direct employment activities.

<table>
<thead>
<tr>
<th>Table 17 Direct Employment In TFL 56.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruising and Engineering</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>RCFC Staff</td>
</tr>
<tr>
<td>Contract Employees</td>
</tr>
</tbody>
</table>

Many secondary jobs are created as a result of RCFC activities and are not included on the above table. These include jobs created as a result of raw logs made available for processing. The following table provides an estimate of the processing jobs created by RCFC saw logs and pulp logs.
Table 18  Secondary Employment In TFL 56.

<table>
<thead>
<tr>
<th></th>
<th>Volume per year* (m³)</th>
<th>Person-years per 1000 cubic metres</th>
<th>Total person-years employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid wood processing</td>
<td>57538 (65%)</td>
<td>0.5</td>
<td>29</td>
</tr>
<tr>
<td>Pulp</td>
<td>30982 (35%)</td>
<td>0.3</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>88520</td>
<td></td>
<td>38</td>
</tr>
</tbody>
</table>

RCFC was created to address the concern of logs (and jobs) leaving town. One of the objectives in creating RCFC was to provide opportunities for local businesses to create local employment. There are no specific objectives regarding first nations employment because there are no first nations communities near TFL 56 or Revelstoke.

RCFC creates opportunities for local employment by:

- Providing a supply of logs through the local log yard that people can purchase.
- Providing sawlogs (50% of RCFC’s sawlogs) to the industry partners to process locally.
- Procuring goods and services locally providing they are available and priced reasonably as well as providing opportunities for local businesses when the goods or services are not available. RCFC spent $6.2 million locally in the 2007-2008 fiscal year.

While RCFC has a distinct focus on local community benefits, it does not prohibit or restrict logs from leaving the community. Businesses from outside the community have equal access to logs sold at our sort yard.

RCFC will continue to:

- Look for opportunities to develop local uses for low-grade pulp logs
- Provide saw logs, 50% to the industry partners, and 50% sold through our local log yard, to a full spectrum of buyers. Local buyers have a distinct advantage in that they do not have pay for transportation out of town.
- RCFC will continue to sort and sell logs based upon feedback from customers and potential customers – this ensures that our sorts are relevant to our customers and opportunities are present to develop local businesses.
- RCFC will also continue favouring local sources of goods and services.
- When local sources of goods and services are not available, RCFC will continue working with local businesses to develop the required expertise and competitive structure to provide these goods and services to RCFC and others in the community.

---

* Does not include BCTS portion of cut (11,480m³/year)

* Source: Revelstoke and Area Land Use Planning Draft Recommendations, Multiple Account Analysis (prepared for the MAC committee and dated August 1997)
10.0 Comparison of Current and Proposed MP

A comparison of major factors and inputs used in MP #3 and MP #4 are described below.

**Timber Supply Modeling:** For MP #4, a timber supply model called Patchworks was used. This is a spatial analysis model that can add limitations to the planned harvest rotation. One can limit the amount of pulpwood and aerial harvest or any other limiting parameter over a period of time. For MP #3, a spatial model was used but it did not have these harvesting restricting principles. This newer type of model produces a more realistic harvesting schedule. Further comparisons will be shown in the table below.

**Resource Inventories:** For MP #4, RCFC used an updated inventory to VRI standards in 2002 with attributes updated to 2008. As a result, the non-productive forest definition was revised based on the VRI inventory and logging history.

**Management Objectives:** There have been no significant changes to the management objectives although the planning and management themselves have changed to better meet the stated objectives.

**Planning:** RCFC has re-evaluated the operability line (1999) and a new operability line has been derived (2008) given better knowledge on the TFL. As a result of this update, the operable landbase has diminished slightly from previous assessments.

**Timber Resource Management:** RCFC continues to use skyline and aerial harvesting on the TFL. Hemlock leading stand have been removed from aerial harvesting areas and aerial harvesting was limited to 8% of the AAC per decade. As well as, group selection, single tree selection, commercial thinning and hybrid harvest systems are being introduced.

**Non-Timber Resource Management:** Mature Forest Retention Areas are no longer used because they have been replaced by spatial OGMAs, and Caribou Reserves. Ungulate winter range retention is no longer required.

### Table 19 Comparison of Timber Supply Modeling In the Current and Proposed MP.

<table>
<thead>
<tr>
<th>MP#3 Base Case</th>
<th>MP#4 Base Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPS-Atlas model used</td>
<td>Patchworks timber supply model used</td>
</tr>
<tr>
<td>Forested operable area = 37,348 ha</td>
<td>Forested operable area =36,085 ha</td>
</tr>
<tr>
<td>THLB = 30,702 ha</td>
<td>THLB = 22,575 ha</td>
</tr>
<tr>
<td>THLB less reserves = 21,628 ha</td>
<td>THLB less reserves = 21,556 ha</td>
</tr>
<tr>
<td>Revelstoke MAC guidelines for ungulate, caribou and biodiversity modeled using RCFC’s mature forest retention areas.</td>
<td>GAR Order for spatial caribou incremental and status quo habitat areas.</td>
</tr>
<tr>
<td>No limitations to aerial or pulpwood content</td>
<td>Limitations to aerial (8%) and pulpwood (35%) harvested per 5 year period</td>
</tr>
<tr>
<td>Unsalvaged Losses = 995 m$^3$/yr</td>
<td>Unsalvaged Losses = 938 m$^3$/yr</td>
</tr>
<tr>
<td>No specific reserves or Wildlife Habitat Areas (WHA)</td>
<td>Downie saltlick (19 ha) and Wildlife Habitat Area in the Downie Loop (2 ha)</td>
</tr>
<tr>
<td>Disturbance of Non-THLB not modeled</td>
<td>Disturbance of Non-THLB modeled (landbase turns over every 567 years)</td>
</tr>
<tr>
<td>Wildlife Tree Retention (WTR) reductions applied</td>
<td>Revised assumptions for WTR (1.75% reduction applied to all yield curves)</td>
</tr>
<tr>
<td>Modeled complex stand yields</td>
<td>No longer using group select (0.5-1.0 ha) on landbase – no longer considered best practice</td>
</tr>
<tr>
<td>No seed gains used</td>
<td>Select seed gains used</td>
</tr>
<tr>
<td>Regeneration assumptions used</td>
<td>Revised regeneration assumptions used</td>
</tr>
<tr>
<td>Conducted sensitivity analysis on Old Growth Site Index (OGSI) but no site index adjustment to base case</td>
<td>SIBEC and growth intercept site index adjustments used. Growth intercept information from silviculture surveys considered best information and ICH SIBEC adjustments used.</td>
</tr>
</tbody>
</table>
11.0 Annual Report

RCFC will continue to produce the *Annual Report for T.F.L. No. 56*. RCFC has produced this document annually since purchasing the TFL in 1993. It contains information on volume production, stand treatments, reforestation, stand tending, forest development and forest protection.

This document has proven valuable in tracking forest management. As new information needs occur, new statistics can be gathered and published in this document. During the MP #3 review process, Columbia Forest District staff requested that performance in aerial harvesting of hemlock stands as well as problem forest types be recorded. RCFC has derived statistics for these items and has been publishing them in their annual reports.

The *Annual Report for T.F.L. No. 56* is distributed internally within RCFC as well as to the Ministry of Forests and Range, Columbia Forest District office.