



Slocan
Integral Forestry
Cooperative

SIFCo

MANAGEMENT PLAN
Slocan Probationary Community Forest Agreement
November 2007

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Slocan Integral Forestry Cooperative

Management Plan # 1

1 Introduction

Per Section 43.3(f) of the Forest Act, a Community Forest Agreement must require its holder to submit a Management Plan to the Regional Manager. The community forest application process directs the applicant to provide a proposed Management Plan with their application. The proposed Management Plan is reviewed and evaluated, and may be amended until satisfactory to the proponent and to government.

This document is the proposed Management Plan for the Slocan Probationary Community Forest Agreement (PCFA) application process. The Slocan PCFA will be held by the Slocan Integral Forestry Cooperative (SIFCo). SIFCo is incorporated under the Cooperative Act of British-Columbia, and was created by four Slocan Valley organizations: The Village of Slocan, The Winlaw Watershed Committee, The Elliot-Anderson-Christian-Trozzo Watersheds Association and the Red Mountain Residents Association. These organizations are well established, have long histories, and are responsive and accountable to clearly defined constituencies. SIFCo will operate the PCFA as a prosperous business in a manner that has the approval, support, and involvement of the communities and residents within and adjacent to its operating area.

SIFCo's business activities during the first five years of operations will encompass forest management, timber harvesting, and the sale of logs. The PCFA will cover an area of 15,852 ha of Crown forest land and have an initial AAC of 16,300 m³ per year. This initial harvest rate is suited to current business conditions, that is, salvage of dead and dying timber during a pine beetle epidemic. Management approach and landbase definition assumptions will be reviewed and may be revised prior to the timber supply modeling for a long term licence application in year 5 of operations.

The Management Plan:

1. describes the management goals of the forest licenses;
2. states the strategies by which these goals can be attained;
3. identifies higher level plans and applicable legislation governing forest stewardship in the community forest area;
4. describes the methods by which the license holder will meet the higher level plan objectives; and
5. identifies any existing or potential problems or opportunities within the Probationary Community Forest Agreement area.

Approval of a management plan represents approval in principle of management intent, but does not give authority to proceed with specific operational activities. Approval for operational activity within a PCFA is done through the Forest Stewardship Plan process, Road Permit application process, and Cutting Permit application process.

This Management Plan is consistent with current forest legislation governing Probationary Community Forest Agreements and Higher Level Plans (the Kootenay-Boundary Higher Level Plan Order) under the Forest and Range Practices Act.

2 Area Description

2.1 License Area

The proposed Slocan Probationary Community Forest Agreement (PCFA) is composed of:

Schedule A Land (Private Land)	None
Schedule B Land (Crown Land)	15,852 hectares
Map Reference:	82F053, 82F063, 82F064, 82F073, 82F083, 82F084, 82F094
UTM Coordinates:	456600, 5486500 to 478800, 5532700

Table 1: Area and coordinates of proposed Slocan PCFA.

2.2 General Location and Area Description

The proposed Slocan PCFA is located within the Arrow Timber Supply Area, on the east side of the Slocan Valley. The PCFA area is discontinuous, and is composed of four separate blocks of land located over an area running from south of Winlaw to south of Silverton.

Community Forest Unit	Area in Hectares
Pedro	10,456
Ringrose	1,407
Red Mountain	3,989
Total:	15,852

Table 2: Area of Slocan PCFA sub-units.

Figure 1 on the next page shows the location of the proposed PCFA area.

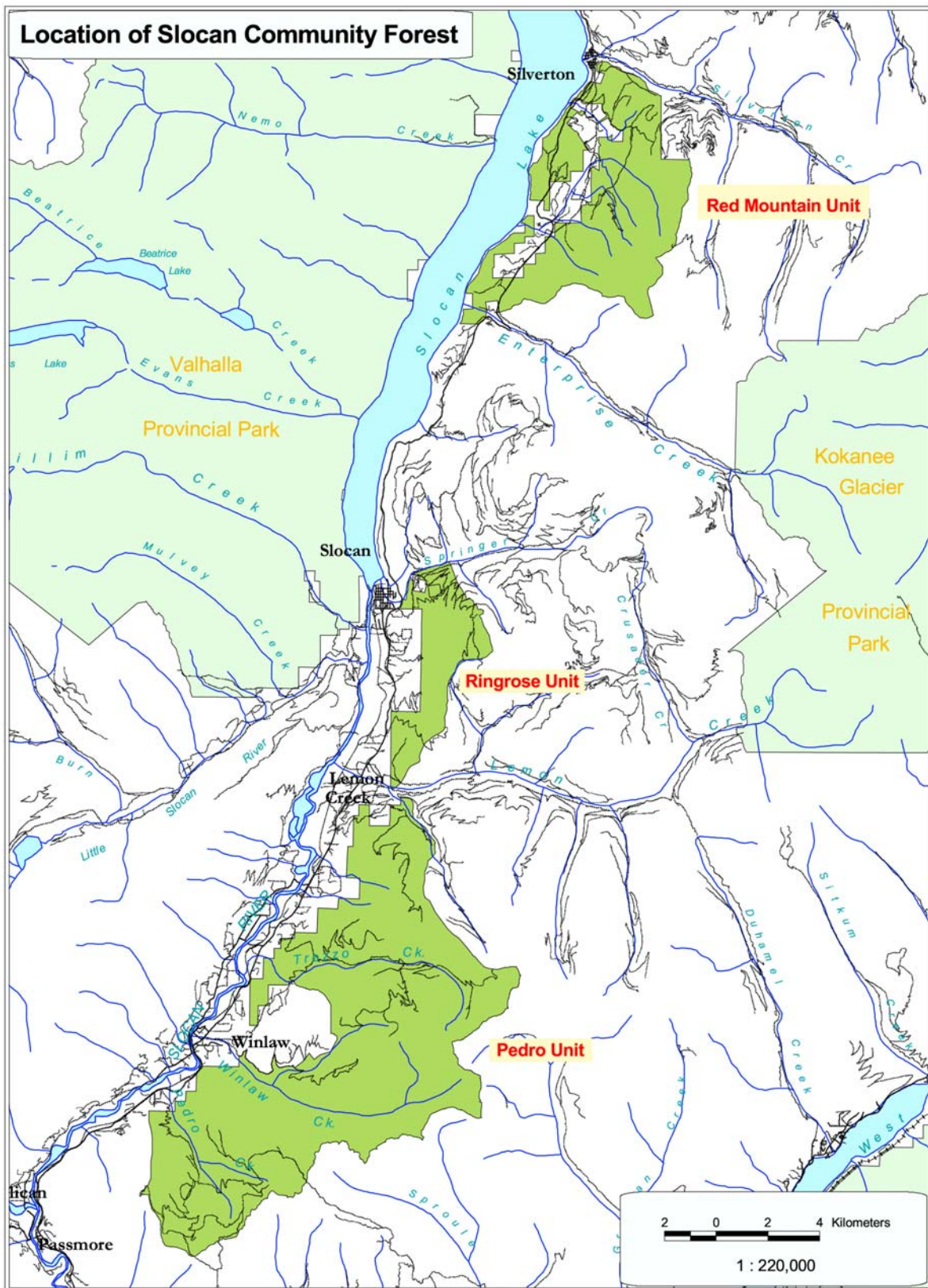


Figure 1: Location of Slocan Probationary Community Forest Agreement

Portions of or all of the watersheds of the following 51 creeks are contained in the PCFA area:

- Anderson Creek
- Aylwin Creek
- Baby Ruth Creek
- Blum Creek
- Brahms Creek
- Braille Creek
- Brogan Creek
- Cabin Creek
- Christian Creek
- Chou Creek
- Congo Creek
- Dane Creek
- Dumont Creek
- Elliot Creek
- Enterprise Creek
- Erhard Creek
- Evdokimoff Creek
- Fairful Creek
- Finland Creek
- Goloff Creek
- Grant Creek
- Harte Creek
- Hasty Creek
- Hemlock Creek
- Highland View Creek
- Hirst Spring Creek
- Holt Creek
- Johnson Creek
- Krissy Creek
- Lemon Creek
- Limekiln Creek
- Marie Creek
- Middleton Creek
- O'Shea Creek
- Pedro Creek
- Perry Creek
- Popoff Creek
- Ravine Creek
- Ringrose Creek
- Sawan Creek
- Seright Creek
- Shook Creek
- Silverton Creek
- South Anderson Creek
- Springer Creek
- Stoorgard Creek
- Thickett Creek
- Trozzo Creek
- Vevey Creek
- Vincent Creek
- Willett Creek
- Winlaw Creek

Table 3: List of named creeks whose watersheds are intersected by proposed PCFA.

In addition, 43 springs, 20 brooks and 5 ponds that are downslope of the PCFA provide drinking and irrigation water to the residents of the area.

The proposed PCFA ranges in elevation from 620 m south of Winlaw to 2360 m at the headwaters of Aylwin Creek. Terrain is variable, but all units contain extensive areas of steep slopes, shallow soils, and/or unstable soils.

The lower slopes and valley bottom directly beneath the PCFA are occupied by continuous rural residential and agricultural settlement. The streams, seeps, and springs fed by the PCFA watersheds are domestic and agricultural water sources for residents of this area. Water resources and water management are the key consideration in development planning.

The biogeoclimatic zones in the PCFA range from low elevation dry, warm Interior Cedar Hemlock (ICHdw) to mid-elevation moist, warm Interior Cedar Hemlock (ICHmw2) to high elevation Engelmann Spruce Subalpine-Fir (ESSFwc1, ESSFwc4, ESSFwcp). Table 4 below shows the distribution the THLB among of biogeoclimatic zones in the proposed PCFA.

Biogeoclimatic Subzone	Community Forest Unit			Total (ha)
	Pedro (ha)	Ringrose (ha)	Red Mountain (ha)	
ICH dw 1	1,359	227	3	1,590
ICH mw 2	2,280	509	1,728	4,516
ESSFwc 1	686	67	0	754
ESSFwc 4	570	70	0	639
Total:	4,895	873	1,731	7,500

Table 4: Biogeoclimatic Subzones on TSR 3 Timber Harvesting Landbase in proposed Slokan PCFA.

Forests in the PCFA area have been extensively impacted by human initiated disturbances, by human suppression of natural disturbance patterns and by land use choices. The legacy of extensive forest fires ignited during mining, railroad construction, land clearing, and forestry activity from 1890 to 1920 is continuous forest cover in the 80 to 120 year age classes throughout the ICH zone and much of the ESSF zone. Most accessible, high elevation old growth forests that escaped the fires were logged in the period from 1960 to 1980. Most of the younger stands in the PCFA are the result of recent clearcut logging. Age class distribution on the timber harvesting landbase, derived from the current VRI data set and TSR 3 assumptions, is illustrated in Table 5 below.

Species Composition of Forests on TSR 3 Timber Harvesting Landbase in Hectares

Age Class	Leading Tree Species in Stand						Total
	Douglas-fir	Larch	Cedar	Hemlock	Spruce or Balsam	Lodgepole Pine	
Young	325	14	29	81	203	238	890
Middle	3,143	549	47	517	175	908	5,339
Old	375	124	189	146	233	77	1,144
Total	3,843	686	265	744	611	1,223	7,372
Non-forest, Deciduous, or NSR							127
Total THLB							7,500

Species Composition of Forests on TSR 3 Timber Harvesting Landbase as Percent of Total

Age Class	Leading Tree Species in Stand						Total
	Douglas-fir	Larch	Cedar	Hemlock	Spruce or Balsam	Lodgepole Pine	
Young	4%	0%	0%	1%	3%	3%	12%
Middle	42%	7%	1%	7%	2%	12%	71%
Old	5%	2%	3%	2%	3%	1%	15%
Total	51%	9%	4%	10%	8%	16%	98%
Non-forest, Deciduous, or NSR							2%
Total THLB							100%

1) Age classes are defined as Young - 1 to 60 years, Mid - 61 to 140 years, and Old - >141 years for all species except Lodgepole Pine, for which age classes of Young - 1 to 60 years, Mid - 61 to 120 years, and Old - >121 years are used.

Table 5: Leading Species and Age Class Distribution on TSR 3 Timber Harvesting Landbase in proposed Slokan PCFA.

Effective fire suppression since 1950 has maintained the uniform age class pattern on much of the landbase, and also resulted in unnatural fuel buildups in dry site ecosystems.

A key legacy of the disturbance history in the PCFA is extensive 60 to 120 year old lodgepole pine forests, which occupy 12% of the THLB. These pine stands, and the pine component of other mixed stands, are currently significantly impacted by mountain pine beetle activity. Based on observed rate of spread and impacts over the last 3 years, it is reasonable to expect that the great majority of the pine component on the PCFA landbase will be dead and un-economical to harvest in the near future.

The proposed PCFA area is extensively accessed by existing logging roads, as shown on the overview map in the Map Pocket on the inside of the back cover.

3 Resource Inventories

3.1 Existing Resource Inventories

3.1.1 Vegetation Resource Inventory

The proposed PCFA is covered by the phase 1 Vegetation Resource Inventory (VRI) for the Arrow TSA that was completed in 2002 by ARC Alpine Resource Consultants Ltd. This data set is the source for all vegetation cover mapping discussed in this management plan.

The map in Appendix A-1 shows the VRI data for the PCFA area themed by species group and age class, and the map in Appendix A-2 shows the VRI data themed by site index (productivity) class.

The VRI data was also used by Forest Ecosystem Solutions Ltd. in the Timber Supply Analysis that identified a timber harvest rate for the proposed PCFA.

3.1.2 Terrain Stability

A unified terrain stability coverage (atern_ar - 2005-03-11) was obtained from the Kootenay Spatial Data Partnership (KSDP) web site. This coverage combines and summarizes a set of Terrain Stability Inventories prepared at separate times for watersheds within the proposed PCFA. This coverage contains only slope stability ratings and does not provide other assessments such as surface erosion hazard and sediment delivery to water course hazard that are found in many Terrain Stability Inventories.

The KSDP terrain coverage also does not contain the TSIL B terrain inventory for Winlaw Creek completed by June Ryder in 2002. We therefore appended the slope stability rating from the Ryder survey to the KSDP coverage.

The map in Appendix A-3 shows the extent of the PCFA area covered by the terrain studies as well as the extent of Terrain Stability Classes 4 and P (potentially unstable) and 5 and (unstable) in the PCFA area.

3.1.3 Watershed Boundaries

Coverages of domestic use watersheds (ldws_ar - 2004-02-17) and community watersheds (tcwsa_bc - 2005-03-11) were obtained from the KSDP web site. These coverages were merged to create one coverage of consumptive use watersheds in the PCFA area.

The domestic use watershed coverage was revised by SIFCo to show the boundaries of additional small domestic use watersheds in the Community Forest area. A coverage of known points of diversion and the TRIM contours were used to delineate these additional watershed boundaries.

The map in Appendix A-4 shows the extent of consumptive use watersheds in the PCFA area and the respective watershed names.

3.1.4 Visual Resources

A coverage of Visual Landscape Inventory (avqo_dab - 2006-02-28) was obtained from the KSDP web site. This coverage contains the Visual Quality Objectives for the proposed PCFA.

The KBLUP scenic areas coverage (darscenic – 2001-05-10) was on file and was used to verify the relationship between the proposed PCFA and scenic areas defined under KBLUP.

The map in Appendix A-5 shows the Visual Quality Objectives within the PCFA area and the boundary of the Scenic Area Class 1.

3.1.5 Old Growth Management Areas

A current coverage of proposed old growth management areas in the Pedro, Lemon, and Idaho Landscape Units was obtained from Stewart Clow of ILMB on March 7, 2006.

Per conversation with Tara DeCourcy, ABFD Stewardship Officer, SIFCo plans to review the OGMA's within the PCFA landbase and may propose changes:

- to balance the proportion of the OGMA's for each landscape unit that are within the PCFA to the percentage of the total landscape unit area that is within the PCFA, and
- to optimize the attainment of multiple resource management goals, the protection of old growth features, and old growth representation within the PCFA landbase.

Mapping of other OGMA's in the landscape surrounding the proposed PCFA was obtained from the Kootenay Lake Forest District and from the ILMB. These OGMA's are shown to provide a landscape context. Some of the OGMA mapping for areas outside of the proposed PCFA is dated and may have been revised.

The map in Appendix A-6 shows the current Old Growth Management Areas in the PCFA landscape.

3.2 Planned Resource Inventories

In the first five years of operations SIFCo will carry out a landscape-level overview planning process that will identify areas with:

- high degrees of ecological sensitivity due to combinations of steep slopes, shallow soils, excessive site moisture, and/or site moisture deficits;
- important wildlife habitat areas;
- important connectivity and movement routes; and
- high non-timber forest use values.

The landscape-level overview plan will propose forest management approaches in the identified areas that will maintain the identified values. The results of the landscape level plan combined with a full timber supply analysis will inform the timber harvest rate determination process following the first five years of operations.

4 Proposed Allowable Annual Cut

Per agreement with the Arrow Boundary Forest District Manager, the allowable annual cut for this Probationary Community Forest Agreement is:

Schedule A (Private) Lands:	Not Applicable
Schedule B (Crown) Lands:	16,300 m ³ per year
Schedule C (Prescribed Products):	Not Applicable

Table 6: Allowable Annual Cut of proposed Slocan PCFA

A preliminary timber supply analysis of the proposed landbase of the Slocan Probationary Community Forest Agreement was carried out by Forest Ecosystem Solutions Ltd (FES) in March 2007. The FES report is included in Appendix F-1. The FES analysis used a combination of TSR II and TSR III data and assumptions, and concluded:

In the case of this analysis, the short-term harvest level was adjusted to the highest level that did not produce a mid-term timber supply shortage and maintained a sustainable growing stock level. ...

The 9,053 hectares of timber harvesting landbase identified by the CF proponent was able to support a sustainable harvest level of 20,000 m³/yr in the long term. In the short term the harvest level is constrained to 15,000 m³/yr for the first 90 years. The harvest then increases to 17,000 m³ per year and reaches the long-term level at 150 years from the present.

The FES analysis was constrained to use the TSR III data set and TSR II and III assumptions, which tends to increase the level of uncertainty in the sustainable harvest rate estimates. Key issues include:

- The constraints used to model Visual Quality Objectives may be overly conservative, as FES used the outdated coverage of Visual Quality Objectives used in TSR III in their analysis, rather than the new ABFD VQO coverage from February 2006. FES expresses the professional opinion that the use of the outdated file “would likely result in a slight upward pressure on the timber supply forecast”.
- Minimum harvest ages used in the FES analysis appear to be underestimated. However, whether the minimum harvest ages used constrain timber flow in the Slocan PCFA is not discussed in the FES report. The minimum harvest ages used were taken from the TSR III data package.
- The FES analysis did not consider the impacts of mountain pine beetle activity, per TSR III assumptions and approaches.
- The TSR III analysis assumed that clearcutting was the harvest method in all situations, except in pine leading stands in the BCTS Chart Area in the ICHmw2 biogeoclimatic zone. We infer from the FES report that clearcutting was the silvicultural system modeled throughout their analysis. This contrasts to SIFCo’s stated management goal of using “partial cutting methods to develop mixed species, multi-layered, multi-aged forest stands in order to maintain biodiversity and to retain or create ecologically important forest structures.” The likely divergence between harvest methods modeled and harvest methods implemented increases uncertainty.

- TSR III assumes that stand yields increase after initial harvest due to improved management practices such as stocking control and the use of genetically selected planting stock. These yield increases are predicated on a clearcut and plant silvicultural system, which is not expected to be widely applied in the Slocan PCFA.
- The TSR III Data Package indicates that no Riparian Management Zone (RMZ) was modeled around Class S6 streams. This contravenes the Forest Planning And Practices Regulation, which calls for a 20 meter wide (both sides) RMZ on S6 streams, and does not reflect SIFCo's management statement that "SIFCo will use a 10 meter (both sides) complete retention buffer and an additional 10 meter wide (both sides) 50% retention buffer on all creeks mapped in the TRIM I dataset to model riparian ecosystem management during map based planning exercises."

The TSR II / TSR III based analysis approach that FES was directed to use may not adequately reflect current forest conditions and/or management intent in the proposed PCFA. Further timber supply modeling, which will be carried out in Year 4 and 5 of SIFCo operations, is required to address these uncertainties.

A key parameter affecting timber flow from the Slocan PCFA in the near term is the mountain pine beetle. A total of 985 ha of the PCFA THLB are occupied by lodgepole pine leading species stands older than 60 years. Many or most of these stands are currently heavily infested with mountain pine beetle. Based on the observed rate of spread and forest health impacts of the pine beetle over the last 3 years, it is reasonable to expect that the majority of the pine component on the PCFA landbase will be dead and non-merchantable in the near future.

FES discussed pine beetle impacts in the conclusion of their Timber Supply Analysis report:

In this analysis the current mountain pine beetle (MPB) epidemic was not modelled. In light of severity of spread and amount of pine within the CFA area (approximately 17%) it is likely that there will be some timber flow impact from the epidemic.

Actual operable volume may vary from this landscape scale, strategic analysis. Factors such as block size, terrain, wood quality, and extent of pine beetle damage / decay will impact the volume that the community forest is able to achieve from the proposed area.

SIFCo's management intent is to salvage beetle attacked lodgepole pine timber from the PCFA THLB while the timber is economically accessible. However, SIFCo's pine salvage success depends on factors which are beyond SIFCo's control, including:

- the rate of spread of the pine beetle,
- the current level of infestation and mortality,
- the rate of decline of beetle-killed timber to 'non-merchantable' status, and
- the date at which road building and cutting authority under the PCFA can be achieved.

Not all beetle-killed pine volume will be salvaged or be salvageable. As FES notes, terrain, wood quality, and extent of pine beetle damage/decay will impact salvage opportunities, as will access costs and total volumes developed by access roads.

SIFCo has completed an assessment of pine beetle susceptibility using the Canadian Forest Service methodology¹ and an air photo based assessment of potential accessibility/operability of susceptible pine stands, and will commence field reconnaissance of potentially operable, susceptible stands as soon possible after the PCFA is awarded.

SIFCo plans to direct half of the 16,300 m³ harvest rate towards pine beetle salvage, if economically feasible salvage opportunities of this magnitude can be found.

The management approach and landbase definition assumptions used for TSR 3-based timber supply analysis may differ from the management approach utilized in the Slocan PCFA in the future. Management approach and landbase definition assumptions will be reviewed and may be revised prior to the timber supply modeling for a long-term license application in year 5 of operations.

¹ Wolfer, Michael A., David Seemann, Caren C. Dymond, Terry Shore, and Bill Riel. 2004. Arc/Info Macro Language (AML) scripts for mapping susceptibility and risk of volume losses to mountain pine beetle in British Columbia. Technology Transfer Note # 33, Forestry Research Applications, Canadian Forest Service, Pacific Forestry Centre

5 Management Objectives

5.1 General Strategic Objectives

The management objective for the Slocan PCFA is to manage the timber resources in the PCFA on a sustained yield basis using ecosystem-based management principles, while simultaneously maintaining or enhancing the non-timber uses, functions, and products of the forest ecosystems of the PCFA.

Watershed management issues are the key non-timber component of forest and land use in the proposed PCFA area. As noted in Section 5.5.4, the proposed PCFA contains all or part of many watersheds that are community, domestic, and agricultural water supplies for Slocan Valley residents and communities. The watershed management objective for the PCFA is to have no detrimental impact on the quantity, quality, and/or timing of flow of water supplies to water users.

Additional management goals for the Slocan PCFA are:

Short-term Objectives

- To salvage beetle-killed lodgepole pine timber from the PCFA THLB while the timber is economically accessible.
- To meet the performance standards set in Section 4 above, forest legislation, and the Kootenay Boundary Higher Level Plan Order.

Medium- and Long-term Objectives

- To carry out a landscape-level overview planning process to identify ecologically sensitive sites, important wildlife habitat areas, and important connectivity routes (as outlined in Section 3.2). Forest management approaches will be proposed for the identified areas that will maintain the identified values.
- To use partial cutting methods to develop mixed species, multi-layered, multi-aged forest stands in order to maintain biodiversity and to retain or create ecologically important forest structures.²
- To improve ecosystem health and resiliency and improve stand vigor by controlling forest stocking levels.
- To maintain and, where necessary, restore biodiversity components such as shrub patches, old growth structures, and riparian ecosystems.
- To provide forest recreation opportunities for the community that do not conflict with water management or forest management objectives.
- To devise a comprehensive, long-term harvest strategy that considers:
 - the desired future condition of the forest landscape,
 - the age class and species distribution on the license THLB,
 - ecological sensitivity, and
 - the needs of non-timber forest uses and users.

² Large-standing green trees, large-standing snags, and large fallen logs. Standing snags and fallen logs are often referred to as coarse woody debris.

This long-term harvest strategy will be devised while identifying a harvest schedule that balances capital investments required to access and harvest timber with economic benefits for SIFCo and the Crown.

- To maximize the social and economic benefits to the local community and the province of British Columbia by:
 - carrying out ecologically responsible timber harvesting, and
 - promoting local employment by local hiring policies.
- To investigate the feasibility of increasing the social and economic benefits to the local community and the province of British Columbia by:
 - entering into agreements to supply timber to value-added manufacturers,
 - implementing training programs for youth and under-employed individuals,
 - initiating agroforestry activities on the PCFA landbase, and
 - facilitating alternative resource use and development.

5.2 Must Meet Government Objectives

SIFCo's resource management on the PCFA area must meet the government objectives defined in current legislation and higher level plans.

The government's objectives are revised as legislation and Higher Level Plans are amended over time. The actual objectives that SIFCo will meet will be consistent with the legislation, regulations, government orders, and Higher Level Plans that are in place at the time the Forest Stewardship Plan is prepared, or as enabled in legislation at a future date.

5.3 Timber Resources

Section 6 of the Forest Planning and Practices Regulation (FPPR) identifies the objectives set by government for timber as follows:

The objectives set by government for timber are to

(a) maintain or enhance an economically valuable supply of commercial timber from British Columbia's forests,

(b) ensure that delivered wood costs, generally, after taking into account the effect on them of the relevant provisions of this regulation and of the Act, are competitive in relation to equivalent costs in relation to regulated primary forest activities in other jurisdictions, and

(c) ensure that the provisions of this regulation and of the Act that pertain to primary forest activities do not unduly constrain the ability of a holder of an agreement under the Forest Act to exercise the holder's rights under the agreement.

5.3.1 Results and Strategies that Relate to Timber

Under Section 12(8) of the FPPR, a person who is required to prepare a Forest Stewardship Plan is not required to prepare results or strategies for an objective set by government for timber. The Forest Stewardship Plan that will be prepared for the license area will therefore not identify results and strategies that relate to timber.

5.3.2 Forest Products

The management intent for timber in the PCFA area is to produce roundwood logs for sale as sawlogs, veneer logs, house logs, timber frame logs, poles, or any other merchantable product.

Wherever possible, minor forest products will be utilized. Minor forest products will be scaled prior to sale and marketed by SIFCo or made available to local businesses. Minor products include fence posts and rails, firewood, and small diameter poles.

5.3.3 Cutting Priorities

Stands will only be harvested if they are both merchantable and economically feasible to harvest. The cutting priorities for this PCFA are as follows:

1. Mountain pine beetle attacked stands
2. Blowdown, fire kill, or other salvage opportunities
3. Stands which are susceptible to insect populations that are active in adjacent areas
4. Potential ecological restoration sites (intermediate cuttings to reduce stocking)
5. Mature stands
6. Fire hazard reduction / fire interface sites
7. Other stands

5.3.4 Utilization Standards

The current BC Interior utilization standards will be followed. Any proposed deviations from these utilization standards will be explained in the Site Plan. Current utilization standards are listed in Table 7.

Maximum Stump Height – All Species	30 cm
Minimum Diameter at Stump Height	
Lodgepole Pine	15 cm
All other species	20 cm
Minimum Top Diameter	
Cedar older than 141 years	10 cm
All other species and ages	15 cm
Minimum log or slab length	3 m

Table 7: Timber utilization standards for proposed Slocan PCFA.

5.3.5 Harvesting

Ground skidding and cable yarding will be the main harvesting systems used in the PCFA. Helicopter yarding will be considered only in cases where there is no alternative and where this system is operationally and economically feasible.

The objectives for harvesting on all parts of the THLB include:

- Harvesting will be carried out in compliance with the standards and regulations detailed in FRPA and associated regulations.

-
- The season of harvest will be selected based on site-specific factors that will be detailed in Site Plans. Factors considered in choosing a season of harvest will include, but are not limited to, potential impact on water quality, potential impact on regeneration environment, potential impact on wildlife, and economics.
 - Harvesting will not be carried out on saturated soils in the spring or at other times of the year.
 - Harvest block design will be consistent with total chance planning. Block boundaries will capture logical harvest units and not isolate small patches that will be harvested in the future.
 - Harvesting systems will be selected and designed to minimize soil disturbance and site degradation.
 - Harvesting operations will minimize damage to residual trees.

5.4 Non-Timber Forest Products

5.4.1 Definitions and Context

Non-timber forest products (NTFPs) are botanical and mycological products and associated services of the forest other than timber, pulpwood, shakes and other wood products. A Probationary Community Forest Agreement (PCFA) or Community Forest Agreement (CFA) are the first and only tenures in B.C. to be able to include the rights to develop and manage NTFPs. However, a lack of provincial policy or regulations to guide the management of NTFPs is a significant barrier to implementing management strategies for NTFPs.

5.4.2 Management

SIFCo's management objectives in regards to NTFPs are:

1. To begin exploring how our PCFA can develop ecologically sustainable and economically viable NTFP activities that will enhance the long-term economic viability of SIFCo.
2. To develop model forest stewardship activities that will – in light of ecological shifts due to climate change – enhance sustainable community economic development.

Many non-timber forest products are present within the PCFA land base, including edible mushrooms, medicinal plants, berries, cedar bark, landscaping materials, tree resins, foliage for the floral industry, and willow, birch and alder stems for basketry and bentwood furniture making.

At this time SIFCo has no immediate plans for the commercial harvest of any NTFPs. Harvesting strategies will be specifically developed for each species prior to commercial harvest. SIFCo will request that the parties interested in harvesting NTFPs propose the harvest location, propose and support a sustainable harvest rate, and show the economic viability of proposed harvesting activities prior to the beginning of any commercial harvest of NTFPs within the PCFA area. SIFCo will consider this information and provincial policies and regulations in deciding whether or not to proceed with proposed harvesting.

5.4.3 Strategies

NTFPs are a potential economic development opportunity that may assist in diversifying SIFCo's activities and in reducing pressure on timber for financial viability. However, the understanding of NTFP management and the legal framework surrounding NTFPs are still in development. SIFCo's primary objectives will therefore be:

- to contribute to the development of comprehensive inventory and mapping of NTFPs,
- to participate in the creation of policy and regulations to guide the management of NTFPs ,
- to contribute to the study of the effect of silvicultural systems on NTFPs, and
- to do market research of potential product lines

5.4.4 Products

Preliminary studies of possible markets shows that the following NTFPs present in SIFCo's proposed land base have significant economic potential:

- Oregon grape, horsetail, devil's club and fireweed root as herbal supplements and as medicinal tinctures and salves.
- Forest cultured mushrooms of a variety of species that could provide the foundation for a local mushroom supply industry.

5.4.5 Limits

SIFCo's sees the use of and free access to NTFPs by local residents as a part of local culture and does not intend to regulate the hobby use of NTFPs by local residents, unless such harvesting is unsustainable or infringes upon Aboriginal rights.

Note: Sections 5.5 to 5.10 below are included in this Management Plan for reference purposes. The approval of management strategies and objectives for these resources will occur at the Forest Stewardship Plan stage.

5.5 Non-Timber Values and Resource Objectives

5.5.1 Visual Landscape Management

The potential timber harvesting landbase in the PCFA overlaps extensively with the Slocan Valley scenic corridor declared under the Kootenay Boundary Higher Level Plan Order (KBHLPO). Visual Quality Objectives (VQOs) have been established for the Arrow TSA. The distribution of visual quality classes on the TSR 3 Timber Harvesting Landbase in the proposed Slocan PCFA is shown in Table 8 below.

Visual Quality Objective	Area of PCFA THLB in Class (ha)	Proportion of PCFA THLB in Class (% of Total)
Not Visually Sensitive	2,782	37%
Modification	672	9%
Partial Retention	3,024	40%
Retention	1,021	14%
Total:	7,500	100%

Table 8: Distribution of Visual Quality Classes on TSR 3 Timber Harvesting Landbase in proposed Slocan PCFA.

A visual simulation will be completed prior to harvesting and road building in areas with a designated VQO to evaluate the extent of visual impacts and identify any mitigative measures required to meet the VQO. The principles of visual design and, where possible, partial cutting will be utilized to mitigate visual impacts. VQO's may be exceeded temporarily if necessary to salvage damaged timber or address forest health issues. The results of the VSP and proposed mitigative measures will be incorporated in the respective site plan.

Visual quality objectives will also be considered in the landscape level planning process.

5.5.2 Biological Diversity

Biological diversity, or biodiversity, is defined as the full range of living organisms in all their forms and levels of organization, and includes the diversity of genes, species, and ecosystems, and the evolutionary and functional processes that link them. Biodiversity will be assessed and managed at both the landscape and stand levels.

Achieving landscape-level biodiversity objectives involves maintaining forests with a range of patch sizes, seral stages, and forest stand attributes that approximates the natural range of such features. The term "natural" has a complex definition that is influenced by factors such as:

- The former "natural" pattern of disturbance events that determined patch size and seral stage distribution included disturbance events and regimes associated with indigenous management choices.
- The history of widespread forest fires associated with human settlement followed by dedicated fire suppression in the last century has obscured natural disturbance patterns on much of the landscape.
- Climate change, both current and over the last several centuries, confounds the identification of "natural" disturbance rates and patterns.

Given the inherent uncertainty in identifying biodiversity goals, SIFCo's general strategy for maintaining biodiversity will be to maintain structural diversity at multiple spatial scales in the PCFA area. This goal will be accomplished by identifying appropriate reserve areas at multiple spatial scales on, or adjacent to, the PCFA landbase and through retention of ecologically significant structures in harvested areas.

SIFCo will address these complex issues in the landscape-level overview planning process outlined in Section 3.2 above. The landscape-level planning process will be completed in

the first five years of the tenure. Initial harvesting activity in the PCFA will focus on pine beetle salvage and will not have impacts on landscape-level biodiversity that are significantly greater than those of the natural pine beetle epidemic.

A key consideration in managing landscape-level biodiversity is retaining and/or creating sufficient, reasonably located forest patches with old growth characteristics to provide habitat for species dependent on, or strongly associated with, old-growth forests. The Ministry of Environment has proposed Old Growth Management Areas within the PCFA that contribute significantly to this objective.

Stand-level biodiversity management requires

- a) maintaining key ecological structures, including large green trees, large dead trees, and large fallen trees in harvested areas, and
- b) explicitly planning to replace these structures over time.

Stand level biodiversity management goals can be achieved through partial cutting approaches, and/or through identified small reserves – wildlife tree patches (WTPs) – in, or adjacent to, harvest areas.

Government objectives for landscape-level biodiversity and wildlife tree retention are discussed below.

5.5.2.1 Landscape-Level Biodiversity

The following objective has been set by government for biodiversity at the landscape level in Section 9 of the FPPR:

The objective set by government for wildlife and biodiversity at the landscape level is, without unduly reducing the supply of timber from British Columbia's forests and to the extent practicable, to design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape.

Land Use Objectives relating to landscape-level biodiversity are specified under Objectives 1 (Biodiversity Emphasis), 2 (Old and Mature Forest), and 4 (Green-up) of the KBHLPO.

The proposed Slocan PCFA is located within the Pedro, Lemon, and Idaho landscape units of the Arrow Boundary Forest District. A map showing the extent of these landscape units and regional connectivity corridors is included in Appendix A-7.

Under Objective 1 of the KBHLPO the Pedro and Idaho Landscape Units have an Intermediate biodiversity emphasis, and the Lemon Landscape Unit has a High Biodiversity Emphasis.

Under Objective 2 of the KBHLPO seral stage targets for a) Mature plus Old Forest and b) Old Forest are identified by natural disturbance type. Table 9 below shows a summary of the current seral stage targets for the Landscape Units in the PCFA.

Landscape Unit	Biodiversity Emphasis Option	Natural Disturbance Type	BEC Unit	Mature Age Limit	Old Age Limit	Mature Plus Old Target (1)	Old Forest Target (2)
Pedro	Intermediate	NDT 1	ESSFwc4	120	250	36%	19%
		NDT 1	ESSFwc1	120	250	36%	19%
		NDT 2	ICHmw2	100	250	31%	9%
		NDT 3	ICHdw	100	140	23%	14%
Lemon	High	NDT 1	ESSFwc4	120	250	54%	28%
		NDT 1	ESSFwc1	120	250	54%	28%
		NDT 2	ICHmw2	100	250	46%	13%
		NDT 3	ICHdw	100	140	34%	21%
Idaho	Intermediate	NDT 1	ESSFwc4	120	250	36%	19%
		NDT 1	ESSFwc1	120	250	36%	19%
		NDT 2	ICHmw2	100	250	31%	9%
		NDT 3	ICHdw	100	140	23%	14%

Natural Disturbance Types:

- NDT 1 - Ecosystems with rare stand-initiating events
- NDT 2 - Ecosystems with infrequent stand-initiating events
- NDT 3 - Ecosystems with frequent stand initiating events
- NDT 4 - Ecosystems with frequent stand-maintaining fires

Table 9: Seral Stage Targets for Landscape Units in proposed Slocan PCFA.

Target is expressed as a percentage of forest area within landscape unit.

Table 10 summarizes the extent of the overlap between the proposed PCFA and the landscape units.

Landscape Unit	Area in Proposed PCFA	Total Area	Percent of Total LU Area in PCFA
Pedro	10,039	19,476	52%
Lemon	2,121	40,914	5%
Idaho	3,693	38,236	10%
	15,852		

Table 10: Proportion of Landscape Units within proposed Slocan PCFA.

The proposed Slocan PCFA has limited overlap with the Lemon and Idaho landscape units. SIFCo will co-operate with the forest licencees who control most of these LUs to ensure that landscape level impacts of forestry activities meet higher level plan objectives, but forest use choices on the PCFA will not be the chief determinants of landscape health and connectivity in the Lemon and Idaho units.

A KBLUPIS connectivity corridor intersects the Slocan PCFA in the Lemon Creek area. The KBLUPIS Section 3.3 will guide management choices in these areas.

SIFCo will be the major licencee in the Pedro landscape unit. The Fretwell reports on the impacts of meeting higher level plan biodiversity targets indicate that 79% of the THLB in the Pedro LU is potentially available for harvest and older than minimum harvest age after allowing for constraints due to biodiversity management, riparian management, visual management, and consumptive use watersheds. (Note that these constraints were modeled using TSR 3 and higher level plan parameters that may differ from community forest operational approaches). This is logical, given that the Pedro LU contains the Winlaw

Watershed and the rugged terrain south of Pedro Creek, two large areas with little harvesting activity to date. The PCFA portion of the Pedro LU contains areas with significant past harvesting (Pedro Creek) and areas with exceptional levels of operating constraints (Elliot –Anderson-Christian watersheds), and will thus likely be somewhat more constrained than the Pedro LU as a whole.

The Ministry of Environment has proposed Old Growth Management Areas (OGMAs), which meet old forest requirements within each landscape unit. SIFCo assumes that the identified OGMAs or equivalent areas are removed from the timber harvesting landbase.

SIFCo will ensure that proposed harvesting and development is consistent with the biodiversity requirements in the KBHLPO.

If harvesting adjacent to another cutblock, SIFCo will ensure consistency with maximum cutblock size and adjacent stand green-up requirements under FRPA. Objective 4 of the Kootenay-Boundary Higher Level Plan Order establishes the green-up height as 2.5 meters for harvested areas that are adequately stocked and 3.0 meters for harvested areas that are not adequately stocked, except in community watersheds, visually sensitive areas to be defined and determined by the District Manager, and known scenic areas. Note that most of the proposed Slocan PCFA is within a known scenic area.

5.5.2.2 Wildlife Trees

The following objective has been set by government for wildlife and biodiversity at the stand level within Section 9.1 of the FPPR:

The objective set by government for wildlife and biodiversity at the stand level is, without unduly reducing the supply of timber from British Columbia's forests, to retain wildlife trees.

In order to meet this objective SIFCo will meet the requirements of the FPPR, which are that:

- a minimum of 7% of the total area of all cutblocks harvested by an agreement holder within a one-year period must be retained in dispersed or aggregated wildlife trees, and
- the minimum amount of wildlife tree retention in each cutblock is 3.5% of the area of the cutblock.

The document *Wildlife Tree Retention: Management Guidance* available from <http://www.for.gov.bc.ca/hfp/index.htm> will be used to provide guidance for ecologically sound wildlife tree retention within the context of provincial legislation.

Wildlife tree retention levels in areas harvested using partial cutting approaches will routinely exceed the FPPR standards.

5.5.3 **Soil Management**

The following objective has been set by government for soils under Section 5 of the FPPR:

The objective set by government for soils is, without unduly reducing the supply of timber from British Columbia's forests, to conserve the productivity and the hydrologic function of soils.

SIFCo will adopt the results and strategies listed in Sections 35 and 36 of the FPPR, which sets limits for soil disturbance and permanent access structures, and specifies the

rehabilitation strategies that are to be used. Other strategies to conserve soil productivity may include but are not limited to:

- conducting terrain stability field assessments on proposed road locations to identify areas of potential slope failure and/or erosion hazard,
- retaining forest cover on confirmed sensitive or unstable areas,
- locating access routes to avoid sensitive or unstable areas,
- locating skid trails prior to harvest to minimize trail length and soil disturbance, and
- placing machine reserves around areas with sensitive soils within harvest areas.

The specific measures to be employed will be specified in the Site Plan for each cutblock.

5.5.4 Water Management

The overall watershed management objective for the Slocan PCFA will be to have no detrimental impact on the quantity, quality, and/or timing of flow of water supplies to water users.

FRPA and regulations will be adhered to with respect to protection of water resources. Objectives set by government distinguish between community and domestic watersheds, and these are therefore addressed separately. Table 11 below lists the domestic and community watersheds that intersect the PCFA area. The map in Appendix A-4 shows the location of domestic and community watersheds within the PCFA area.

Watershed	Watershed Classification	Watershed Area in PCFA (ha)	Total Watershed Area (ha)	Percentage of Watershed in PCFA
Anderson Creek	Domestic Use	102	491	21%
Aylwin Creek	Domestic Use	298	306	97%
Baby Ruth Creek	Domestic Use	238	239	99%
Blum Creek	Domestic Use	192	438	44%
Brahms Creek	Domestic Use	584	813	72%
Brogan Creek	Domestic Use	56	170	33%
Chou Creek	Domestic Use	56	159	35%
Christian Creek	Domestic Use	370	473	78%
Congo Creek	Domestic Use	228	246	93%
Dumont Creek	Domestic Use	65	737	9%
Eight Mile Basin	Domestic Use	381	381	100%
Elliot Creek	Domestic Use	198	237	83%
Fairful Creek	Domestic Use	78	300	26%
Fingland Creek	Domestic Use	203	205	99%
Goloff Creek	Domestic Use	54	79	68%
Hasty Creek North	Domestic Use	308	511	60%
Hasty Creek South	Domestic Use	249	275	90%
Hemlock / Dane	Domestic Use	73	95	76%
Lemon Creek	Domestic Use	464	7,338	6%
Limekiln Creek	Domestic Use	57	136	42%
Oshea Creek	Domestic Use	167	302	55%
Pedro Creek	Domestic Use	1,707	1,716	99%
Perry Creek	Domestic Use	141	326	43%
Popoff Creek	Domestic Use	125	239	52%
Ravine / Evdokimoff	Domestic Use	294	816	36%
Ringrose Creek	Domestic Use	169	264	64%
Sawan Creek	Domestic Use	31	81	38%
Shook Creek	Domestic Use	74	180	41%
Silverton Face	Domestic Use	665	915	73%
Springer Creek	Community Watershed	338	5,161	7%
Storgaard Creek	Domestic Use	56	129	44%
Trozzo Creek	Domestic Use	2,644	2,723	97%
Vevey Creek	Domestic Use	590	867	68%
Vincent / Grant	Domestic Use	171	274	62%
Willet Creek	Domestic Use	73	159	46%
Winlaw Creek	Domestic Use	4,181	4,755	88%
Outside Consumptive Use Watersheds		174		
Total:		15,852		

Table 11: Consumptive Use Watersheds intersected by proposed Slovan PCFA.

5.5.4.1 Community Watersheds

The government is in the process of establishing objectives for community watersheds under the Government Actions Regulation (GAR), but this process is not yet complete. Until the government establishes water quality objectives under the GAR, Section 8.2 of the FPPR is the objective set by government for water in community watersheds:

- 8.2 (1) *In this section, “community watershed” means a community watershed*
(a) that is continued under section 180(e) of the Act, and

-
- (b) for which a water quality objective has not been
- (i) continued under section 181 of the Act, or
- (ii) established under the Government Actions Regulation.
- (2) The objective set by government for water being diverted for human consumption through a licensed waterworks in a community watershed is to prevent to the extent described in subsection (3) the cumulative hydrological effects of primary forest activities within the community watershed from resulting in
- (a) A material adverse impact on the quantity of water or the timing of the flow of the water from the waterworks, or
- (b) The water from the waterworks having a material adverse impact on human health that cannot be addressed by water treatment required under
- (i) an enactment, or
- (ii) the license pertaining to the waterworks.
- (3) The objective set by government under subsection (2) applies only to the extent that it does not unduly reduce the supply of timber from British Columbia's forests.
- (4) If satisfied that the objective set out in subsection (2) is not required to provide special management the minister responsible for the Wildlife Act must exempt a person from the requirement to specify a result or strategy in relation to the objective.
- (5) If satisfied that the objective set out in subsection (2) is addressed, in whole or in part, by an enactment, the minister responsible for the Wildlife Act must exempt a person from the requirement to specify a result or strategy in relation to the objective set out in subsection (2) to the extent that the objective has already been addressed.

Only a small portion of one community watershed, the Springer Creek watershed, (338 hectares, or 7% of the total Springer Creek watershed area) is contained within the proposed PCFA. Because 93% of the Springer Creek watershed is outside of the PCFA, the cumulative hydrological effects of forest management choices in the Springer Creek watershed will not be controlled by SIFCo. However, SIFCo will manage the portion of the Springer Creek watershed that lies within the PCFA to prevent direct negative impacts on water quality.

Practices that will apply to community watersheds are Sections 59 to 63 of the FPPR. Some of the measures listed include:

- Ensuring that timber harvesting or road building does not cause sediment that is harmful to human health to enter a stream, wetland or lake from which water is being diverted for human consumption by a licensed waterworks
- Not harvesting timber or building a road within 100 meter of a licensed waterworks where the water is diverted for human consumption, unless the timber harvesting or road construction will not increase sediment delivery to the intake;
- Not locating a road closer than 100 meters upslope of a spring that is identified by the minister, unless the construction does not interfere with the subsurface flow path of a drainage area that contributes to the spring.

Prior to harvesting, road construction, or permanent deactivation in a community watershed, a hydrological assessment of the proposed activity will be completed. All proposed cutblocks, roads, and road deactivation will be consistent with the

recommendations of the hydrological assessment and the FPPR. Riparian management areas (reserve zones and management zones) will be placed around all classified streams as required under the FPPR.

5.5.4.2 Domestic Watersheds

A total of 97% of the PCFA landbase lies within Domestic Watersheds, that is, consumptive use watersheds that are not community watersheds. The government has set objectives for consumptive use watersheds outside of community watersheds under Objective 6 of the KBHLPO as:

Objective 6. Consumptive Use Streams

(1) To reduce the impacts of forest development on streams licensed for human consumption, apply the following streamside management provisions to S5 and S6 streams that meet the stated conditions:

a) Stream side management provisions:

i. The stream side management zone will extend from the edge of the stream channel bank or the outer edge of the active floodplain, to a minimum distance of 30 meters on each side of the stream, or to the top of the inner gorge, whichever is greater; and specific measures to safeguard water licensed for human consumption must be described for activities in the stream side management zone.

b) The provisions apply to:

- i. The segment of a stream between the water intake which is licensed for human consumption and the upstream point where stream order is reduced and, if the intake is located on a first-order stream, the entire stream length above the intake;*
- ii. A stream on which there is a water intake which is licensed for human consumption;*
- iii. A stream on which the location of a water intake is shown on Map 6.1. (Intakes shown are licensed for human consumption).*

c) The provisions do not apply where:

- i. The stream is within the Enhanced Resource Development Zones – Timber areas under objective 7 (Map 7.1); or*
- ii. It has been established that a licensed intake is not being utilized for human consumption.*

There are no Enhanced Resource Development Zones – Timber areas within the PCFA area.

When proposing forest development within domestic watersheds, SIFCo will follow the above streamside management provisions and in most cases exceed them.

SIFCo will also liaise with 3rd party organizations to implement monitoring programs for major streams within the PCFA area.

5.5.4.3 Additional Water Management Strategies

The following strategies that are presented in other portions of this Management Plan will also assist in meeting SIFCo's watershed management objective:

- Forest roads will be constructed to the minimum practicable Road Class standard in order to minimize soil disturbance, exposed erodible soils, and road clearing width (Section 5.8).
- Road cross drains will be located to maintain natural water flow patterns and natural water courses (Section 5.8).

- Stream crossings will be kept to a minimum (Section 5.5.5).
- Riparian reserve zones will be identified and located as deemed appropriate. (Section 5.5.5)
- Soil disturbance levels will be considered when selecting harvest systems, harvesting equipment, and harvest season (Section 5.3.5).
- Disturbed areas will be re-vegetated as quickly as possible. Native grass species and native shrubs or trees will be used where practicable (Section 5.10).
- Partial cutting will be used wherever feasible to maintain forest cover in harvested areas (Section 5.1).

5.5.5 Riparian Areas

The objective set by government for water, fish, wildlife, and biodiversity within riparian areas in Section 8 of the FPPR is:

The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas.

SIFCo believes that responsible management of riparian ecosystems is a key factor in meeting the Community Forest management goals. SIFCo's riparian management approaches will meet or exceed the requirements set out in the FPPR, specifically sections 47 to 51, 52(2), and 53 which outline riparian reserves, management zones, and forest retention by riparian class.

Additional strategies that will assist in meeting the FPPR objectives include, but are not limited to:

- Forest road stream crossings will be kept to a minimum.
- Riparian ecosystems will be delineated in the field and site specific management approaches for riparian ecosystems will be developed during operational planning.
- Riparian reserve zones will be meet the targets set in FPPR sections 47 to 49, but may be expanded as deemed appropriate by SIFCo planners.
- Trees that contribute to long-term channel and bank stability will be retained.
- SIFCo's planned use of partial cutting where feasible will result in exceeding the basal area retention standards for riparian management zones set out in the FPPR in many situations.

During map based planning exercises, computer generated buffers are used to model the approximate impacts of operational planning decisions for riparian ecosystem management. The *Strategies for the Kootenay Boundary Higher Level Plan Order* suggest that "the best management practices of S4 streams (interior) ... will help in the development of the specific measures to safeguard water licenced for human consumption." The S4 BMPs call for a 10 meter wide (both sides) complete retention zone along the stream, and an additional 10 meter wide (both sides) partial retention zone.

SIFCo will use a 10 meter (both sides) complete retention buffer and an additional 10 meter wide (both sides) 50% retention buffer on all creeks mapped in the TRIM I dataset to model riparian ecosystem management during map based planning exercises.

5.5.6 Recreation Management

There is only one recreation site or trail in the PCFA with legally established objectives per FRPA Section 181. The objectives are listed in Table 12.

Project Number	Project Name	Objectives
5075	Rockslide Lake Trail	98/05/26 The objective is to manage the Rockslide Lake recreation trail for a forested semi primitive recreation experience. The trail will be maintained and adjacent vegetation conserved. Opportunities for hiking and viewing are available, no mechanized uses permitted.

Table 12: Legally Established Recreation Features in proposed Slovan PCFA.

Recreation sites and trails are considered “resource features” under FRPA. SIFCo will comply with Section 70 of the FPPR and Section 5 of the GAR, which essentially require that primary forest activities (timber harvesting, silviculture treatments, or road construction, maintenance, and deactivation) do not damage or render ineffective a resource feature.

Harvesting and road construction adjacent to a recreation site or trail with established objectives will be conducted in accordance with the established objectives. Forest practices conducted within a recreation site or trail will be conducted with written authority of the District Manager.

There are additional recreational features located within the PCFA landbase that are not included in Table 12 because they do not have legally established objectives. These include the access road to the Skycastle Lookout recreation tenure and the northerly leg of the skidoo trail that accesses the Crusader Creek Cabin. These access routes pass through the Ringrose Unit of the PCFA.

Other recreation resources currently exist or will be developed in the proposed PCFA area. SIFCo is confident that public involvement in forest planning will identify these sites and features.

The forest management objective for these locations will be to identify and maintain the values that led to the establishment of these community recreation features, without unduly reducing the potential for SIFCo to meet its other objectives.

5.5.7 Cultural Heritage Management

Section 10 of the FPPR identifies the objectives set by government for cultural heritage resources:

The objective set by government for cultural heritage resources is to conserve, or, if necessary, protect cultural heritage resources that are

(a) the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and

(b) not regulated under the Heritage Conservation Act.

Planning documents and proposals will be referred to First Nations as directed by the Ministry of Forests and Range First Nations Liaison person for comment and review. This form of referral will continue until such a time as a mutually agreed upon review and comment process has been developed with interested First Nations groups.

If evidence of Cultural Heritage Resources are observed, become known, or are brought to the Licensee's attention in the future, the Licensee will submit information for review by the appropriate archaeological and heritage authority and First Nations representatives before development proceeds.

If SIFCo becomes aware of a previously unrecognized cultural heritage resource that will be affected by an approved road permit or cutting permit, SIFCo will modify or cease operations to the extent necessary to protect the resource, until the above measures are carried out.

5.5.8 Range Management

No range tenures overlap the PCFA area at this time. No range objectives or measures are specified for this license area.

5.5.9 Wildlife Management

The KBHLPO and Section 7 of the FPPR identify objectives for wildlife. Where there are conflicting government objectives, the KBHLPO takes precedence as per Section 150.4 of the *Forest and Range Practices Act*.

5.5.9.1 Caribou

The PCFA area is outside of identified caribou habitat areas, and therefore no objectives or measures are applicable.

5.5.9.2 Grizzly Bear Habitat and Connectivity Corridors

Objective 5 of the KBHLPO lists the government's objectives for Grizzly Bear Habitat and Connectivity Corridors:

(1) To maintain mature and/or old forests adjacent to important grizzly bear habitat (avalanche tracks, denning sites, etc) as shown on Map 5.1 subject to objectives 5(5) and 5(6)*

(2) Transition: Objective 5(1) takes effect four months after mapping of important grizzly bear habitat is completed and made available.

(3) To maintain mature and/or old forests within connectivity corridors shown on Map 5.2, for the purposes of regional forest ecosystem connectivity subject to objectives 5(5) and 5(6).

(4) Forests situated on slopes greater than 80 percent do not contribute to the connectivity component of this objective.

(5) Where applicable, mature targets must be used to address this objective if connectivity corridors and/or grizzly bear habitat have been identified. Protected areas must first be used to reduce the mature target where available within the biogeoclimatic unit.

(6) Old targets should be used to address this objective unless other conservation values such as protection of rare or under represented old growth forests would be adversely affected. Protected areas must first be used to reduce the old target where available within the biogeoclimatic unit.

** Currently important grizzly bear areas have not been mapped but will be added when available.*

The map included in Appendix A-8 shows grizzly bear habitat class and connectivity corridors from the Kootenay Boundary Land Use Plan Implementation Strategy (KBLUPIS).

While Objective 5 of the KBHLPO identifies objectives for grizzly bear habitat, the objective has not yet taken effect because it was contingent on completion of grizzly bear habitat mapping, and this has not yet occurred. SIFCo operations will be consistent with Government objectives for grizzly bear habitat once they take effect.

In the interim, SIFCo will work with wildlife biologists to systematically identify valuable grizzly bear habitat within the PCFA. SIFCo will inform the appropriate Government agencies of any habitat so identified, and will manage the forests in the identified potential habitat areas to maintain the valuable habitat features. The KBLUPIS Section 3.4 will guide management choices in these areas.

A KBLUPIS connectivity corridor intersects the Slocan PCFA in the Lemon Creek area. The KBLUPIS Section 3.3 will guide management choices in these areas.

5.5.9.3 Wildlife

The following objective have been set by government for wildlife under Section 7 of the FPPR:

- (1) The objective set by government for wildlife is, without unduly reducing the supply of timber from British Columbia's forests, to conserve sufficient wildlife habitat in terms of amount of area, distribution of areas and attributes of those areas, for*
 - (a) the survival of species at risk,*
 - (b) the survival of regionally important wildlife, and*
 - (c) the winter survival of specified ungulate species.*
- (2) A person required to prepare a forest stewardship plan must specify a result or strategy in respect of the objective stated under subsection (1) only if the minister responsible for the Wildlife Act gives notice to the person of the applicable*
 - (a) species referred to in subsection (1) and*
 - (b) indicators of the amount, distribution and attributes of wildlife habitat described in subsection (1).*
- (3) If satisfied that the objective set out in subsection (1) is addressed, in whole or in part, by an objective in relation to a wildlife habitat area or an ungulate winter range, a general wildlife measure, or a wildlife habitat feature, the minister responsible for the Wildlife Act must exempt a person from the obligation to specify a result or strategy in relation to the objective set out in subsection (1) to the extent that the objective is already addressed.*
- (4) On or after December 31, 2004, a notice described in subsection (2) must be given at least 4 months before the forest stewardship plan is submitted for approval.*

The government has, through the GAR, established Wildlife Habitat Areas (WHAs) for the Coeur d'Alene Salamander, the Flammulated Owl, and the Interior Western Screech-Owl. None of the WHAs established to date are within or near the PCFA area.

SIFCo's management strategy for these species will be to work to identify potential habitat with the attributes listed in the Notice during planning operations. SIFCo will inform the appropriate government agencies of any habitat so identified. If no direct instructions

result from this notification, SIFCo will manage the forests in the identified potential habitat areas to maintain the identified valuable habitat features.

The government has, through a Notice under the GAR, established Ungulate Winter Range locations and guidelines for mule deer, white-tailed deer, elk, and moose in the Arrow Timber Supply Area. A map showing the location of identified ungulate winter range in the PCFA landscape is included in Appendix A-9. White-tailed deer and mule deer winter range areas occur within the PCFA.

The measures listed under Schedule 1 of the Notice and the Supporting Materials will be followed when managing ungulate winter range in the PCFA area. The measures and supporting materials specify the ratio of snow interception cover to foraging habitat, the minimum forest cover and forest characteristics required for snow interception, and limit the amount of early seral forest within a given management unit.

SIFCo's general wildlife habitat objective in all areas of the PCFA is to provide habitat for wildlife by maintaining or creating forest conditions that mimic the natural range of tree species groups and age classes, without unduly reducing the potential for SIFCo to meet its other objectives. Live and dead tree retention levels in partial cuts outside of pine beetle infested areas will be a key factor in achieving this objective.

5.5.10 Fisheries Management

There are no fisheries-sensitive watersheds identified at this time within the PCFA and thus no measures, results, or strategies for the management of fisheries sensitive watersheds are identified. Section 5.5.5 outlines the management approach in riparian areas of fish-bearing streams outside of fisheries-sensitive watersheds.

5.6 Forest Protection

5.6.1 Fire Prevention

The increasing effects of climate change, the known ignition hazards in the human-forest interface, and the current fuel loading in forests after decades of fire suppression create a significant fire risk in the Slocan PCFA. The proximity of much of the operating area to human settlement increases the potential significance of any unplanned fire events.

In the long term, SIFCo will manage this risk proactively:

- by considering fire hazard, risk to property, and feasibility of risk reduction through treatment when developing the landscape-level plan for the PCFA;
- by reducing ladder fuels and fuel loading near settled areas where feasible, using partial cutting techniques;
- by managing fire hazard levels associated with timber harvesting through harvest scheduling and through fire hazard abatement where required; and
- by assisting landowners to employ fire protection regimes on their forested properties.

These actions will reduce the risk of ignition, as well as the spread rate and severity of fires should they occur.

Slash hazard assessments will be conducted in all areas affected by industrial activities at the intervals prescribed by Section 11 of the Wildfire Regulation. A hazard mitigation plan will be developed and implemented as soon as possible for any areas with an unacceptable fire hazard due to slash loading.

Potential strategies to reduce fire hazard following logging include, but are not limited to:

- lopping and scattering elevated slash accumulations,
- piling and burning slash accumulations,
- disposing of landing and roadside logging debris,
- broadcast burning, and
- access control.

Fire prevention and fire management actions will be consistent with the Wildfire Act and the Wildfire Regulation, which set out, among other things, the required response to fire danger ratings, the nature of fire suppression equipment required at activity sites, and the required precautions to prevent escape of fire.

SIFCo will prepare and annually update a Fire Preparedness Plan, which will be distributed to staff, Board members, and contractors. This plan will:

- include a fire standby schedule,
- identify fire detection, preparedness, and suppression procedures,
- describe planned operations for the season,
- provide contact numbers for local contractors and equipment that may be available for fire suppression in the license area, and
- contain a summary of relevant portions of the Wildfire Act and the Wildfire Regulation.

5.6.2 Forest Health

The forests in the proposed Slocan PCFA contain the diversity of pathenogens generally associated with middle-aged stands that are developing a more complex stand structure. Endemic levels of tree-killing insects and diseases are part of a healthy forest and are important factors in maintaining forest biodiversity. However, maintaining “pest” populations at endemic levels, without a population increase to epidemic levels, may be a challenge. The pine beetle epidemic suggests that other insects may respond to altered climatic conditions and landscapes occupied by 80 to 120 year old forests with increased activity levels

The objectives of forest health stewardship are to:

- acknowledge the ecological roles of endemic populations of tree-killing insects and diseases;
- protect timber resources from excessive damage from insects and diseases;
- foresee and avoid management activities that encourage the growth of pathenogen populations;
- maintain or restore the ecosystem structure, function, and composition necessary to ensure long-term forest health; and

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- conduct salvage harvesting in areas impacted by unacceptably high levels of insect or disease related mortality to recover timber values and, if feasible, to reduce total pathogen population size and/or rate of spread.

The primary forest pathenogens within the PCFA area are:

- Mountain Pine Beetle. Susceptible, middle-aged lodgepole pine forests occupy 12% of the THLB in the PCFA. These pine stands, and the pine component of other mixed stands, are currently impacted by the mountain pine beetle epidemic. Based on the observed rate of spread and impacts over the last 3 years, it is reasonable to expect that the majority of the pine component within the PCFA landbase will be dead and un-economical to harvest in the near future.
- Douglas-fir bark beetle. The 2006 summary of aerial overview surveys in the Southern Interior Region indicates that Douglas-fir bark beetle populations are currently at low levels. This situation may change in the future.
- Armillaria root disease. Armillaria occurs at endemic levels throughout the operating area and is associated largely with Douglas-fir. Armillaria concentrations can provide valuable wildlife habitat resources.
- White Pine Blister Rust. White pine blister rust has killed a significant proportion of the mature white pine in the lower elevations of the PCFA area and causes mortality in white pine regeneration.
- Dwarf Mistletoe. Dwarf Mistletoe affects western larch throughout the PCFA area. Infestation levels in stands range from low to heavy.

Forest Health Management Strategies

The following are general forest health management strategies that SIFCo intends to employ:

- Insect population levels will be regularly monitored using aerial and ground detection surveys. If the MoFR or another agency carries out an annual monitoring and detection over-flight, SIFCo will use their information. If not, SIFCo will perform this function itself. Significant and accessible insect activity areas will be further assessed with ground-based surveys.
- The Arrow Boundary Forest District has a forest health strategy prepared by the Defined Forest Management Area (DFAM) group that is updated regularly to address current forest health issues and provide management guidance. SIFCo will refer to this document and consult with MoFR staff on forest health issues.
- Management activities to address specific insect or disease issues will depend on the extent, distribution, and location of infestations, as well as the impact on other forest values. Proposed salvage harvesting or other treatments will not compromise other values such as water quality, quantity, and timing of flow.
- Slash in Douglas-fir and spruce harvest areas will be managed to minimize bark beetle host material left on logged areas.
- Harvest areas known to contain significant levels of Armillaria will be replanted with a mix of tree species that are resistant to the disease, and seedlings will be planted away from stumps to minimize root contact with inoculum.
- White pine blister rust will be managed by salvaging existing losses and by planting blister-rust resistant stock on selected white pine growing sites. The reforestation

objective will be to create mixed species stands that include a rust resistant white pine component.

- Dwarf mistletoe will be managed by removing infested trees during harvest operations, except for infested, high-quality, safe, wildlife trees, which will generally be retained. Locations close to infested residual trees will be replanted with non-susceptible species.

5.7 Silviculture (Reforestation)

5.7.1 Basic Silviculture

The main reforestation objective is to meet the requirements of FRPA Section 29 and FRPPA Section 16 and 44 to establish a free growing stands following harvest.

Strategies to meet restocking obligations following harvest include, but are not limited to:

- Stocking standards specified in the Forest Stewardship Plan for the PCFA will be consistent with current MoFR stocking standards.
- A mixture of natural regeneration and planting will be used to adequately restock harvested areas. Natural regeneration will be favoured in partial cut harvest areas, and planting will be favoured in areas with low residual stocking.
- Planting stock selection will favour larger stock types to improve survival and to reduce free-growing and green-up periods.
- Multi species stands will be managed for wherever possible. Management approaches to meet this goal include planting multiple species, or planting single species in areas with significant stocking of acceptable natural regeneration.
- Site preparation will be used where required to increase plantability and/or to provide a suitable seedbed for natural regeneration. Site preparation methods may include, but are not limited to, piling and burning, broadcast burning, and mechanical site preparation.
- Brushing treatments will be implemented as required to meet free-growing targets.
- Chemical herbicides will not be used for brush control in the PCFA.

5.7.2 Incremental Silviculture

Incremental silviculture projects such as pruning or spacing may be proposed. Proposals will depend on the availability of suitable treatment areas and on the availability of Forest Investment Account (FIA) funding for such projects.

5.8 Road Construction, Maintenance, and Deactivation

SIFCo's objectives for road construction, maintenance, and deactivation are:

- To construct, maintain, and deactivate roads in a manner that is consistent with the FRPA and the FPPR.
- To ensure that roads constructed or maintained by SIFCo are structurally sound and safe.

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- To minimize the impact of roads on non-timber forest resources, such as water supplies.

Strategies to meet these goals include, but are not limited to:

1. Minimizing the length of roads constructed in the PCFA area by using total chance planning standards that consider the need to access all parts of the THLB when designing road systems.
2. Constructing roads with the minimum running surface width permitted by reasonable safety considerations. Most roads will be constructed to a Road Class 6 standard (4 to 4.5 meter wide running surface). Where possible, turnouts will be located at landing locations required for future harvesting.
3. Constructing roads with the minimum clearing width necessary to accommodate the road with reasonable safety considerations in order to limit the hydrologic and visual impacts from the road clearing.
4. Designing and maintaining drainage structures to ensure that water flow is not impeded and that natural drainage patterns are maintained.
5. Developing and following a road inspection and maintenance program to ensure that roads, ditches, and drainage structures will perform as designed, especially in spring freshet and/or severe rain events.
6. When deactivating a road, to follow the measures listed in Sections 82 to 83 of the FPPR, including, but not limited to, barricading the road, removing bridges and culverts, stabilizing the road prism, and posting deactivation signs.

5.9 Materials Management

Strategies to manage petroleum products and other industrial materials include, but are not limited to:

- SIFCo will prepare and annually update a Materials Handling and Spill Response Plan, which will be distributed to staff, Board members, and contractors. This plan will:
 - identify appropriate materials handling protocols,
 - list the cleanup equipment required at work sites,
 - set out first response and clean up obligations in case of a spill event, and
 - provide contact information and reporting protocols in case of a spill event.

5.10 Invasive Plant Species

Per FRPA Section 47 and FPPR Section 17, SIFCo will use the following strategies to limit the spread of invasive plants in the PCFA:

- Disturbed areas will be re-vegetated with an appropriate mix of grasses and herbs. Native grass species and native shrubs or trees will be used where practicable.
- The undercarriage of harvesting and road construction equipment will be cleaned before the equipment enters the PCFA landbase.
- Invasive plant patches along the right of way of forest service roads leading to active harvesting operations will be mechanically controlled before seed heads

mature in order to limit seed production and potential transport by vehicles. In cases where the total area occupied by invasive plants exceeds the budget, the control operations will commence at the upper boundary of the invasive plant patch and work down from there.

6 Referrals and Consultations

SIFCo will follow the referral requirements communicated by the Arrow Boundary Forest District regarding Forest Stewardship Plan referrals required under Section 21 of the FPPR.

6.1 Trappers, Guides, and Other Licensed Resource Users

The Forest Stewardship Plan for the PCFA will be referred to:

- licensed trappers,
- guide outfitters,
- commercial recreation licensees,
- water user groups,
- other users that have shown past interest in specific development, and
- forest tenure holders sharing a common landscape unit.

Any plans for development on slopes that are greater than 47% above highways will be referred to the Ministry of Transportation's Snow Avalanche Program.

6.2 First Nations

In general, the form and extent of First Nations involvement in planning will be determined by:

- the requirements of legislation and policy,
- guidance provided by government through such articles as FRPA Administration Bulletin Number 1, and
- the relationships that SIFCo develops with First Nations through their representatives.

The proposed PCFA lies within the traditional territory of the Sinixt Nation. At this time, the Sinixt Nation is not officially recognized by the B.C. government. The proponents have met with representatives of the Sinixt twice, and will continue to supply plans and information to them for their review.

Formal First Nations consultation is the responsibility of government. Formal consultation will be initiated at the following stages in the PCFA award process: area identification, license offer, Management Plan approval, and License approval.

The Forest Stewardship Plan will also go through a formal consultation process. However, the Crown has chosen to delegate the procedural aspects of consultation to the licencees seeking the approval through FRPA. SIFCo will follow the process set out in FRPA Administration Bulletin Number 1 when preparing, referring and seeking approval of their Forest Stewardship Plan. The MoFR Stewardship Officer will also be contacted for direction prior to the First Nations referral processes.

Where requested by First Nations or government, planned roads and cutblocks will be referred to First Nations to provide an opportunity for review and comment in order to help

ensure that development does not impact traditional use activities or cultural heritage resources.

6.3 Community Members and Local Governments

Community representatives will be included in operational and landscape planning processes, as discussed in the Business Plan Section 2.2.2.

Section 4 of the Business Plan and Section 4 of the Community Involvement Document outlines additional community participation initiatives.

Community members, local governments, and the general public will also be invited to review and comment on the forest stewardship plan.

7 Government Objectives

The Government has published a list of government objectives that may be fulfilled by community forest licences. The proposed Slocan PCFA will fulfill the published government objectives as follows:

- SIFCo's management objectives meet the standards set in legislation in respect to environmental stewardship, including the management of timber, water, fisheries, wildlife, and cultural heritage resources, and are in accordance with approved land use plans.
- The community will also receive long-term benefits from achieving a key community goal: gaining community control over forests with high social and environmental values. The community will also gain medium to long-term employment and other benefits from primary forestry activity on the PCFA landbase, and from financial returns generated by the community forest and returned to the community for ecological restoration, community infrastructure, and local social programs. These factors are discussed more fully in Section 9 of the Business Plan.
- The proposed PCFA will diversify the use of and benefits derived from the community forest agreement area, encourage co-operation among stakeholders, and provide social and economic benefits to British Columbia by being a key step in bringing "peace in the woods" to the Slocan Valley. Co-operation among stakeholders is already in evidence during the PCFA application process, as parties with diverse interests and histories work together to facilitate the creation of the PCFA. We believe that orderly flow of timber from the watersheds in the proposed Slocan PCFA will be an incremental increase in timber flow in the Arrow TSA, with a concomitant increase in and diversification of economic activity. At the least, orderly forest management and harvesting will mean a reallocation of resources away from conflict without resolution and toward productive and positive activities. These factors are discussed more fully in Section 9 of the Business Plan.
- SIFCo will conduct business in an innovative way by being incorporated as a co-operative and including community members and representatives in planning processes and decision making (See Section 2.2.2 of Business Plan). The performance measure of this innovative approach will be success in meeting harvest and stewardship objectives.

