Lillooet Forest District

Inventory Plan

MINISTRY OF FORESTS
RESOURCES INVENTORY BRANCH
JUNE 1998

Table of Contents

List of Tables

1. INTRODUCTION

1.1 Background

The Provincial Vegetation Resources Inventory (VRI) or Provincial Inventory is an improved vegetation (forest) inventory process or toolbox for assessing the quantity and quality of British Columbia's timber and other vegetation resources. It addresses the concerns expressed by the Forest Resources Commission in its 1991 report, *The Future of our Forests*. These concerns included:

- lack of statements of precision of the inventory;
- inadequate information on non-timber vegetation resources;
- lack of reliable estimates of growth rates and stand specific volumes; and
- narrow focus on commercial timber volume and the timber harvesting landbase.

The VRI can be implemented at a number of levels depending on the business needs. It can be deployed over the entire province (one or more Forest District at a time), measuring all the timber and non-timber resources. The VRI can also be deployed over a Management Unit (TFL or TSA) or a small watershed within a District, measuring selected resources in specific portions of the landbase.

The Provincial Inventory consists of a system of protocols, models and databases that can be managed through a dispersed computing environment. The Provincial Inventory process can be used to meet today's needs for timber supply, long term planning, silviculture planning, defining sustainability, public information and credibility. The Provincial Inventory can also provide data for computer modeling and decision support systems to support a baseline biodiversity assessment and for research.

The Vegetation Resources Inventory is designed to determine:

- the amount of vegetation cover in the province;
- the location of vegetation resources in the province; and
- the changes in the amount and location of vegetation resource over time.

The principles guiding the implementation of the inventory are:

- to integrate provincial inventory activities (e.g. Management Inventories, Provincial Inventory, National Forest Inventory and Monitoring);
- to implement inventory projects to satisfy business requirements as defined in the inventory plans; and
- to maximize the usefulness of sample plots and minimize overall costs by implementing a cascading plot approach that ensures that information collection meets the VRI standards while meeting multiple goals.

Management Inventories include inventories conducted in Implementation Units[1], to fulfill specific forest management or business needs. Sampling error and sampling intensity are controlled for specific vegetation attributes (e.g., timber volume) to achieve specific inventory objectives. There are several types of Implementation Units in the province: Timber Supply Areas (TSAs), Tree Farm Licenses (TFLs), and other lands (parks, private lands, and other public lands). Within (or across) these Implementation Units there may be Management Inventories addressing specific issues such as Problem Forest Types, or other strata in a TSA (or groups of TSAs).

Management Inventories are typically timber emphasis inventories. Besides providing detailed polygon information for day-to-day forest management, they can also be used to increase precision of the Provincial Inventory. The TFL holders or the MoF Regions/Districts are responsible for the planning and implementation of these inventories. However, the Ministry of Forests Resources Inventory Branch requires the TFL holders or Districts to prepare an inventory business plan, which includes a sampling plan, for its approval. An inventory business plan defines the inventory needs, the information needed to meet the needs, and the methods for collecting the information. This business plan then drives the inventory project plans.

1.2 Objectives

This is a plan for implementing the Provincial Vegetation Resources Inventory and Management Inventory activities in the Lillooet Forest District in the Kamloops Forest Region. This plan was developed through consultation with various stakeholders during the spring of 1997 in the Lillooet Forest District, including the Ministry of Forests, Branch, Region and District staff, Ministry of Environment, Lands and Parks, and the Licensees' staff who identified inventory local needs and priorities. Management issues identified in the recent TSR in the TSA were also reviewed.

The purpose of the Inventory Plan is to:

1. define the Management Inventory objectives;
2. define the Provincial Inventory strategy for Lillooet Forest District;
3. identify the inventory activities required to satisfy the objectives for both inventories; and
4. outline the implementation steps.

This plan is based on the consultant report, *Lillooet Forest District Vegetation Resources Inventory Ground Sampling Plan*, prepared by J.S. Thrower & Associates. The report was prepared following the procedures outlined in the Ministry of Forests, Resources Inventory Branch procedures, *Vegetation Resources Inventory: Preparing a sampling plan for*

[1] Implementation Units are a specified area of land such as a TSA, TFL, Innovative Forest Practices Agreement area, etc. For any Implementation Unit, there can be none to several Management Inventories based on stakeholder business needs.

ground sampling (March 1997). The report has been reviewed by stakeholders in the District and is attached to this Inventory Plan (see Appendix A).

This Inventory Plan identifies stakeholder requirements at a given point in time. As such, it is anticipated that there will be changes to this plan. Any changes including plans that are more detailed and roles and responsibilities will be added to this plan as an addendum.

2. BUSINESS CONSIDERATIONS

2.1 Forest Management Issues

Forest management issues were identified during the recent timber supply review (Table 1). An assessment of potential impacts of the VRI ground sampling on these management issues is also shown in this table.

Table 1. Forest management issues for the Lillooet TSA and the potential impact on the Provincial Inventory

	Management Issues[2]	Remarks
1.	Estimates of areas in riparian reserves and management zones.	Potential impact possible with better Phase I estimates: assignment of "wetland" land classification to polygons in the Phase I will help identify wetlands and their associated riparian areas.
2.	Biodiversity impacts on timber supply (wildlife trees, patch retention, Douglas-fir reserves in the Montane Spruce BEC zone, high stumps).	Phase II will provide overall District totals for coarse woody debris, stumps, potential wildlife trees, and plant lists for species diversity. This information can be used to check existing biodiversity guidelines and provides a basis for additional sampling. There is a risk that precise estimates will not be obtained for these attributes.
3.	Impacts of root rot on volume.	Phase II plots will provide estimates of the incidence root rot in the District, which can be used as a base for more detailed subsequent studies or research.
4.	Relationship between trees identified for high stumping as wildlife trees and the assumed losses due to decay, waste, and breakage.	Stem analysis of trees for net volume adjustment factor (NVAF) sampling can be used to check decay relationships. The NVAF data cannot be used to check waste and breakage relationships.
5.	Effects of intensive silviculture on timber supply	Phase II will help provide information to help check yield curves for treated stands, however, it will not provide information on treatment response. This must be done through designed experiments, possibly in conjunction with monitoring plots (which may be a subset or superset of VRI plots).
6.	Site productivity estimates in second-growth stands.	Site index measurements from Phase II plots can be used to check existing site index estimates.

[2] BC Ministry of Forests, Timber Supply Branch. 1996. *Forest Management Issues Identified Through the AAC Determination Process. TSA/TFL Timber Supply Reviews: 1992-1996*. Victoria, BC. pp. 55-61.

	Management Issues[2]	Remarks
7.	Terrain stability mapping and impacts.	Phase II data could be used by interpreters of terrain stability.
8.	Estimates of timber inventory net volume.	Improved District net volumes by removing overall bias and net volume adjustment. Statistical statements of accuracy for the overall inventory will be provided.
9.	Operability assumptions or principles (options for harvesting on steep slopes and inaccessible slopes than currently assumed)	The Phase II adjustment will help provide more accurate estimates for polygons on steep slopes. However, this issue will probably require more intensive sampling to be satisfactorily addressed.
10.	LRMP (Land and Resources Management Planning): provide direction for appropriate management objectives for biodiversity, wildlife habitat, VQOs, and protected areas.	Plant lists, forage production, and shrub transects from Phase II plots provide District totals, which could be used to confirm base interpretations for wildlife and for biodiversity. Improved Phase I estimates will provide additional information on delineating wildlife habitat and protected areas.
11.	Low stocking regeneration levels (compliance with provincial standards).	The type and intensity of Phase II sampling is not appropriate to address this issue. This could be addressed through better Phase I estimates, special studies and silviculture surveys.
12.	Volumes to support Pulpwood Agreement #16 (PA 16)	Volumes should be determined through special inventories when development intentions become clearer. Phase II information will assist in planning these special inventories.
13.	Temporary AAC reduction in contentious areas.	Application of the inventory.
14.	Cut control (under-cutting due to protracted planning processes and deferral of areas).	Application of the inventory.
15.	Localizing VDYP	Phase II will help check VDYP assignment of overall volumes for the District. Adjusted Phase I estimates provide polygon starting volumes for projection.

2.2 Inventory Issues

The most recent Timber Supply Review and the Inventory Audit identified specific issues and information to improve the inventory. Some of the issues and information identified by Ministry of Forests, Region and District staff and some licensees include:

- The quality of work involved in the re-inventory of the District is in question.
- The 1995 Inventory Audit of the District indicated mature timber volumes were under-estimated by approximately 18% on average.
- Increased pressure on the operating landbase caused by removal of the Stein Valley and moratoriums on land use in the Spruce Lake Area.
- Lodgepole pine forest types excluded from the timber harvesting landbase require further refinement.

- Wildlife habitat area delineation.
- Possible mislabeling of high elevation spruce/balsam stands.
- Age in inventory is over-estimated.
- Pine beetle has killed a high proportion of the lodgepole pine component.
- Stands covered under PA 16 need re-inventory.
- Dry-belt fir issues: volumes assigned by VDYP may be incorrect; difficulty identifying dry-belt fir stands; and inaccurate estimates of wildlife-related attributes (e.g., crown closure and aspect).
- Provincial monitoring of the indicators of sustainable forest management, as defined by the Canadian Council of Forest Ministers (CCFM).[3] Monitoring would involve measuring changes and trends in some of these indicators, which include percent and extent of area by forest type and age class, and mean annual increment by forest type and age class.
- Issues raised by the Forest Resources Commission's 1991 report, *The Future of Our Forests*, regarding the inadequacy of forest inventories in the province. These concerns included lack of statements of precision on the inventory, inadequate information on non-timber vegetation, and the narrow focus on commercial timber volume and the operable landbase.

3. INVENTORY PLAN

3.1 Provincial Inventory

3.1.1 Provincial Inventory Landbase

The Landbase for the Lillooet Provincial Inventory is the Lillooet Forest District in the Kamloops Forest Region. The Lillooet Forest District covers approximately 1,124,000 ha and is located on the eastern slopes of the Coast mountain range. The area encompasses drainage systems of the Stein, Yalakom, Bridge River, and portions of the Thompson River valleys, all of which drain into the Fraser River. The ecology of the District varies from coastal transitional to very dry interior areas.

The Lillooet Forest District contains about 51% productive forest land.[4] The remaining areas include non-forest and non-productive land (approximately 49%). The proportion of the productive forest area contributing to the long-term timber harvesting landbase is

[3] Canadian Council of Forest Ministers. 1995. *Defining Sustainable Forest Management: A Canadian Approach to Criteria and Indicators.* Natural Resources Canada, Canadian Forest Service. Ottawa,ON. 22pp.

[4] BC Ministry of Forests. (1996) *Lillooet Timber Supply Area: Rationale for Allowable Annual Cut (AAC) Determination.* Victoria, BC.

approximately 49%. Thus only about 23% (257,821 ha) of the TSA was considered available for timber production in the most recent AAC rationale.

3.1.2 Objectives

3.1.2.1 Photo Interpretation

Photo interpretation work has been considered but is not recommended for the Lillooet Provincial Inventory or for the Management Inventory.

3.1.2.2 Ground Sampling

The objective of the Provincial Inventory ground sampling in the Lillooet Forest District is to provide overall totals and averages for timber and non-timber vegetation resources. The Provincial Inventory ground sampling will aim to achieve a sampling error of $\pm$10% (at the 95% probability level) for net timber volume in the treed portion of the District and to allow for calculation of sampling errors for other VRI attributes. The Provincial Inventory will cover the *entire* District including the timber harvesting landbase, inoperable landbase, parks, recreation areas, ecological reserves and private lands. The key attributes of interest are stand age, net volume by species, stand height and species composition. The variability of these tree attributes will be used to set the sample size.

3.1.3 Sampling Plan

3.1.3.1 Sample Size

To achieve the inventory objectives as identified above, the sample sizes required to implement the Provincial Inventory are summarized in Table 2. In inventory, a sampling error standard is necessary to provide a basis for determining sample size. In the VRI, the allowable sampling error standard is set at ±10% for volume estimation at the Unit/District level. This standard does not apply to other attributes in the inventory.

The number of samples required to achieve the standard is a function of the variation within the inventory unit, estimated by the coefficient of variation (CV%). The estimated CV in the Lillooet Forest District used to estimate the total number of plots to achieve a sampling error of ±10% for net volume is 63%[5]. To achieve the VRI standard at a reasonable cost, two types of VRI plots will be used:

- full VRI samples, where the full suite of information (timber, coarse woody debris, range and ecology) is collected; and
- tree emphasis samples, where only tree information is collected.

[5] The inventory audit CV was inflated by 25% to account for the possible differences between the CV estimates based on the VRI design (a tight 5-plot cluster) and based on the inventory audit (a well-distributed 9-plot cluster).

The total number of full VRI samples (70) will be adequate to achieve a sampling error of ±15% in the treed landbase. Tree emphasis samples (TEP) (90) will then be used to reduce the sampling error in the treed landbase to ±10% to achieve the standard.

In the remaining non treed area of the unit, the number of full VRI samples established will be the ratio of the treed to remaining landbase, multiplied by the number of treed VRI samples required to achieve a sampling error of ±15% (55).

Implementing the two types of samples will ensure a minimum number of full VRI plots are established across the landscape to collect the full suite of VRI information. Establishing TEPs to boost the number of plots required to achieve the VRI standard will result in saved time and money.

To complete the Provincial Inventory, NVAF (net volume adjustment factor) and WPV (within polygon variation) sampling is required. The numbers of these types of samples are contained in Table 2.

Table 2. The estimated sample size required to implement the Provincial Inventory.

Ground Sampling Activity	Sampling Unit	VRI Samples	Tree Emphasis Samples	Sample Size
Provincial Inventory				
Vegetated Treed	Cluster	70	90	160
Other	Clusters	55		55
Net Volume Adjustment Factor	Trees	75		75
Within Polygon Variation	Polygon	30		30

3.1.3.2 Provincial Inventory Sampling

To achieve the Provincial Inventory objective, the sampling should be implemented in a two-step process. Step 1 is to install approximately 100 sample clusters in the first field season over the entire District. Step 2 is to install the remaining sample clusters in the second field season. The sampling locations will be selected systematically from the sorted list of potential sampling points. This list will include all polygons in the District and will be sorted by non-vegetated/vegetated and then land type, leading tree species, age, and site index. Sampling in the first year will provide experience to refine the process for the second field season, and information to calculate precisely the remaining number of samples required to meet the precision target of ±10% for total net volume in the treed portion of the District. An estimated total of 215 sample clusters will be assumed for planning, training, and other logistic considerations. Matching unavailable sampling sites with sub-sampling of sample clusters with difficult access will be anticipated and planned for, as these activities will increase inventory costs.

A two-step approach should also be used for implementing the other ground sampling activities that support the Provincial Inventory process: NVAF sampling and WPV sampling. NVAF provides a factor to adjust the net volume from the ground sampling

(derived from the net factoring process and taper equations) to account for hidden decay and possible bias in taper equations. WPV information is used to express the total error of the inventory and to indicate accuracy of individual polygon estimates. A total of 75 sample trees for NVAF sampling (selected from 15 treed and 1 non-treed polygons) and 30 sample polygons for WPV sampling are required.

3.2 Management Inventory

3.2.1 Management Unit Landbase

For the Lillooet Forest District, the Management Unit is the *treed landbase* as defined by the BC Land Cover Classification system. Table 3 provides an approximation of the area to be assessed by the Provincial Inventory and the Management Inventories.

Table 3. Area by Inventory Unit within the Lillooet Forest District

Inventory Type	Inventory Unit	Area (ha)
Provincial Inventory	Forest District	1,124,000
Management Unit	Treed Landbase	635,000

3.2.2 Objectives

3.2.2.1 Photo Interpretation

Photo interpretation has not been identified as an immediate requirement for the Management Inventory.

3.2.2.2 Ground Sampling

The objective of the Management Inventory is to improve the accuracy of timber volume inventory in the "treed" portion of the landbase in the District. The number of samples will ensure at least $\pm$10% sampling error (at the 95% probability level) for timber volume in the "operable landbase" in the District.

Improving the accuracy of timber information through implementing the Management Inventory will address the immediate needs identified by the recent TSA timber volume audit.

3.2.3 Sampling Plan

To achieve the Management Unit objective, supplemental sampling will be required in the "operable" landbase. The supplemental sampling will involve the installation of approximately 160 sample clusters in the "treed" landbase measuring only tree attributes (80% in the operable and 20% in the inoperable landbase). The implementation should proceed immediately in a manner similar to the Provincial Inventory Phase II sampling.

The sampling will be spread over a period of 2 years, with unbiased interim results expected after the first season. Sampling in the first year will provide experience to refine the process for the second field season, and information to calculate precisely the remaining number of samples required to meet the precision target of ±10% for timber volume in the operable landbase. An estimated total of 160 sample clusters will be assumed for planning, training, and other logistic considerations.

NVAF sampling is a critical component of the VRI design. Stakeholders should identify within their more detailed *Inventory Plans*[6] the level of NVAF sampling.

4. IMPLEMENTATION STRATEGY

The ground samples that are established to meet the Management Inventory objectives are compatible with the Provincial Inventory objectives providing that these dual purpose plots are identified prior to establishment. Therefore, Provincial Inventory plots will be identified prior to identifying the Management Inventoryground sampling plots. These coincident plots will be used for both the Provincial Inventory and the Management Inventory. Additional Management Inventory samples will be established to meet Management Inventory objectives. This integrated approach, that uses one set of samples to address multiple inventory needs, will result in minimum implementation costs.

There may be a need to enhance the coincident plots for non-timber attributes within the Management Units depending on the implementation strategy chosen. Additional Provincial Inventory ground samples will need to be established in the non-Management Inventory area in order to complete the Provincial Inventory for the Lilloet Forest Districts.

The inventory outlined above will be completed to the Ministry of Forests minimum standards as outlined in *Implementation Strategy to Integrate Management, Provincial and National Inventories*.

4.1 Steps

There are several ways to complete the ground sampling in the two-step process stated above. It is hoped that stakeholders will complete all the required ground sampling in a timely manner. One possible scenario is as follows:

1. Install a large number of each Management Inventory sample clusters (e.g., 100) over the entire landbase measuring *only those* tree attributes related to timber volume and site index. Install the Provincial Inventory samples for plots that are designated “multi-purpose” and install tree emphasis plots for the others. This will provide the experience to refine the process for the second field season and will provide information to calculate the required number of remaining sample clusters.

[6] Inventory Plans are required by stakeholders in order to proceed with their Management Inventories.

2. Install the remaining Management Inventory sample clusters in the second field season. (Note: the stakeholder may choose to install all ground samples in one field season).

4.1.2 Implementation Process

The implementation process will proceed based on available funding and can be implemented based on a number of scenarios. All implementation scenarios will a common process. One possible implementation process could proceed as follows:

1. Assemble all polygons within the District into one list; check to ensure no areas are missing or double counted.
2. Sort the polygon list according to the criteria: BC Land Cover Classification code, estimated leading tree species, age and site index.
3. Select potential sampling points from the sorted list, as described in the Ministry of Forests, Resources Inventory Branch document, *Vegetation Resources Inventory: Preparing a sampling plan for ground sampling*.
4. Stratify list to *vegetated treed* and *remaining area* (non-vegetated, vegetated non-treed).
5. Systematically select the Provincial Inventory samples by stratum.
6. Systematically select the polygons for the within polygon variation sampling from the list of Provincial Inventory samples.
7. Systematically select the 16 NVAF sample points (15 treed and 1 non-treed whether or not volume is indicated) from the Provincial Inventory ground samples.
8. Stratify the District to determine the Provincial Inventory samples that meet Management Inventory objectives. Subtract this number of samples from the total required for each Management Unit. Select the remaining number of Management Inventory samples for each unit.
9. For the Management Unit, systematically select a batch of sampling points from the list of operable sampling points (80% of the sample size) and from the list of inoperable sampling points (20%).
10. Begin planning for field sampling.
11. Prepare a field sampling plan that includes sample cluster batches to ensure an unbiased sample is attained at the end of the first field season. Identify NVAF sample points and ensure they are field sampled early in the field season.
12. Locate and measure ground sample clusters.
13. Monitor quality assurance of field data and procedures during field sampling. Arrange for ‘audit quality cruisers’ to sample auxiliary plots of NVAF samples.
14. Compile the data in the fall and winter of the first year. This will include computing averages of timber volume, basal area, and regression of photo

estimated volume to ground sample volume and the associated standard error of the regression.

15. Prepare NVAF tree sampling matrix. Begin NVAF destructive sampling.
16. Prepare for the second step during the winter. This will include calculation of the CV based on the standard error of the regression. The remaining number of samples required to achieve the stated desired precision can then be accurately determined using standard procedures (see Appendix B).
17. Prepare the remaining samples.
18. Locate and measure remaining ground sample clusters in the second field season. Complete stem analysis of the NVAF sample trees. Complete the within polygon variation sampling.
19. Compile all data, do the statistical adjustments and load final inventory results into the provincial database.

4.2 Cost

4.2.1 Provincial Inventory

The Provincial Inventory costs, for planning purposes, are summarized in Table 4.

Table 4. Estimated costs required to complete the Provincial Inventory sample plan.

Ground Sampling Unit	Sample size	Unit Cost* ($)	Total Cost ($)
Provincial Inventory			
Sample Cluster (VRI)	125	2,500	312,500
Sample Cluster (tree only)	90	1,500	135,000
Net Volume Adjustment Factor – Tree	75	500	37,500
Within Polygon Variation	30	1,500	45,000
Total			530,000

* The unit costs are based on experience gained from the Boston Bar Operational Trial.

A CV of 63% and the objective precision level of ±10% sampling error (at the 95% probability level) were used to estimate the required number of Provincial Inventory samples.

Sampling efficiency and cost effectiveness will be achieved by implementing the Provincial Inventory ground sampling in combination with the Management Inventory sampling. Results of the VRI ground sampling can be evaluated to determine the additional sampling required to meet the specific objectives.

4.2.2 Management Inventory

The costs for completing the Management Inventory are identified in Table 5.

Table 5. Estimated costs required to complete the Management Inventory sample plan.

Ground Sampling Unit	Sample size	Unit Cost ($)	Total Cost ($)
Management Inventory Sampling			
Sample Cluster (tree only)	160	1,500	240,000
Total			240,000

A CV of 63% and the objective precision level of ±10% sampling error (at the 95% probability level) were used to estimate the required number of Management Inventory samples. Additional plots were added to increase the number of samples available for post-stratification.

4.2.3 Combined Management Inventory and Provincial Inventory

Implemented separately, the total cost of the Provincial Inventory and the Management Inventories would be approximately $770,000. Combining the inventory objectives through a common implementation strategy will realize a saving. Given the multiple Management Units within the Kamloops and Clearwater Forest Districts and their overlapping areas, it is difficult to estimate the magnitude of these savings. However, the savings on the Provincial Inventory samples would be approximately $240,000 based on implementing all of the vegetated treed VRI and tree emphasis samples in combination with the Management Inventory plots.

Table 6 illustrates the combined costs to complete the Management and Provincial Inventory sampling. The total cost could be higher or lower if the assumptions stated above are not valid. For example, an increase in the CV or a reduction in the desired precision level will result in an increase in the number of samples required to achieve the objectives. The relationship between the sampling error and sample size is illustrated in the contractor report (Appendix A).

Table 6. Combined costs to complete the Management and Provincial Inventory sample plans.

Ground Sampling Unit	Sample size	Unit Cost ($)	Total Cost ($)
Management Inventory Sampling			
Sample Cluster (timber only)	160	1,500	240,000
Incremental Provincial Inventory Ground Samples			
Sample Cluster (VRI)	70*	1,000	70,000
Sample Cluster (tree only)	90*	0	0
Provincial Inventory (Remaining)			
Sample Cluster (VRI)	55	2,500	137,500

Sample Cluster (tree only)	0	1,500	0
Net Volume Adjustment Factor - Tree	75	500	37,500
Within Polygon Variation	30	1,500	45,000
Total			530,000

*Tree information to be captured as part of the Management Inventory sample

The total cost could be higher or lower if the assumptions stated above are not valid. For example, an increase in the CV or a reduction in the desired precision level will result in an increase in the number of samples required to achieve the objectives. The relationship between the sampling error and sample size is illustrated in the contractor report (Appendix A).

Depending on the implementation strategy, the savings will vary. The savings realized reflect the comparative overlaps of the Management Inventories. The numbers in Table 6 reflect one possible implementation scenario. Costs will change depending on the actual implementation scenario chosen.

4.3 Monitoring

The Ministry of Forests, Resources Inventory Branch is responsible for monitoring this Inventory Plan.

5. APPROVAL/SIGNING

I have read and concur with the Lillooet Forest District Inventory Plan, January 30, 1998. It is understood that this is an agreement-in-principle and does not commit the signatories to completing the inventory activities outlined within the plan. Modifications to this plan or more detailed plans need to be reviewed and approved by the signatories and then appended to this plan.

_____

District Manager
Lillooet Forest District

_____

Regional Manager
Kamloops Forest Region

_____

Director
Resources Inventory Branch

_____

General Manager
Ainsworth Timber Ltd.

Appendix A

Lillooet Forest District
Vegetation Resources Inventory
Ground Sampling Plan

Appendix B

Polygon Selection