

**Ministry of Forests Lands and Natural Resource Operations
Forest Analysis and Inventory Branch**

**Inventory Section
2011/12 Annual Report**

For the Inventory Section of Forest Analysis and Inventory Branch (FAIB), this document provides:

1. an overview of the inventory section,
2. a reconciliation of what we accomplished in 2011-12 with what we said we'd do in the 2011-12 FAIB Business Plan, and
3. a breakdown of expenditures in 2011-12 by program area.

1 Section overview

The inventory section:

- i) collects, manages, and makes available forest inventory information for British Columbia; and
- ii) develops and makes available stand growth and yield models.

The inventory section is the dominant provider (and in many cases the sole provider) of these tools and information in BC.

The section comprises 28 staff located in Victoria, Nanaimo, Nelson, Kamloops, and Campbell River. Our primary products are i) a province-wide forest inventory polygon data set (the “veg-comp-poly” files), ii) stand growth and yield models (TASS, TIPSY, VDYP), and iii) a variety of tree section, ground plot, and photo-plot data sets (TSP, PSP, CMI, NFI, NVAF, etc). In addition, we acquire and make available several types of imagery (mid-scale and large-scale air photos, orthophotos, and Landsat scenes). We produce and maintain a number of GIS spatial layers including a province-wide site index layer, PSP location layer, year of MPB mortality layer, and a harvest block layer. Also, we provide a wide variety of reports, custom data summaries, expert review and advice, analyses, model simulations, and protocols and standards.

Our data and models are used to characterize current, and forecast future, forest condition. This information is used in many settings including the analysis of fibre supply, evaluation of tenure options and business opportunities, simulation of forest carbon dynamics, silviculture program design, operational planning, state of forest reporting, habitat planning, management of visual resources, biodiversity assessment, and much more.

A wide range of public- and private-sector users utilize our products and services, obtaining them in many ways. Many of our products are accessed and downloaded from our branch web

site including the stand growth models, several data sets (such as the PSP data set), and published reports, protocols and maps. The provincial, forest cover polygon data is provided to users through the GeoBC and DataBC data distribution portals. Many users access our forest inventory through software applications such as iMapBC and HectaresBC. To service special requests, we provide custom data extracts. Imagery acquired for forest inventory is provided to GeoBC and made available on the GeoBC image distribution web site. Last, in response to user requests, inventory section staff provide expert advice and analyses related to forest inventory, monitoring, and stand growth modelling.

2 Reconciliation of accomplishments against planned activities

Each year, the FAIB Business Plan lists the projects that the inventory section plans to undertake in the fiscal year. For the period April 1, 2011 to March 31, 2012, the table below lists i) what we said we'd do in the 2011-12 FAIB Business Plan, and ii) what we actually accomplished in the fiscal year. The table is limited to the commitments detailed in section 3.2 of the 2011-12 FAIB Business Plan (available at <http://www.for.gov.bc.ca/hts/vri/>). Many other significant accomplishments, in areas not specified in the business plan, are not included in the table.

What we said we'd do in the 11/12 branch business plan	What we accomplished in 11/12
AIR PHOTOS: Acquire air photos in five management units through GeoBC (Williams Lake, 100 Mile House, TFL 14, TFL 23, Kamloops).	We acquired air photos in 5 of the 5 planned management units and achieved 100% of the planned coverage. Additional imagery was acquired for TFL 35 and portions of the Pacific TSA. All imagery was made publicly available through the GeoBC web site.
LANDSAT: Acquire Landsat satellite imagery for the entire province.	We acquired Landsat satellite imagery for the entire province.
PHOTO-INTERPRETATION: Initiate, continue, or complete photo-interpretation projects in eight management units (Williams Lake, 100 Mile House, Haida Gwaii, Mid-Coast, TFL 14, TFL 23, Kamloops, Sunshine Coast).	We initiated, continued, or completed 7 of the 8 planned projects (all but Kamloops). Additional photo-interpretation was initiated in a portion of the Pacific TSA. Photo-interpretation in Kamloops is now planned to commence in spring/summer 2012.
GROUND SAMPLE: Conduct VRI phase 2 ground sampling in four management units (Mackenzie, TFL 18, TFL 53, Kootenay Lake).	We prepared sampling plans for each unit and completed VRI phase 2 ground sampling in 3 of the 4 planned management units (all but Kootenay Lake). Sampling in Kootenay Lake is now planned to commence in summer 2012.

<p>NVAF: Develop provincial NVAF sampling plan. Collect 180 NVAF samples in three high priority management units (Fort St John, Mackenzie, and TFL 18).</p>	<p>We developed a 2011-12 provincial NVAF sampling plan. We conducted NVAF sampling in 2 of the 3 planned management units (all but Mackenzie). NVAF sampling in Mackenzie is now planned for summer 2012. Additional NVAF sampling was undertaken in Prince George, Revelstoke, and TFLs 30, 46, and 53.</p>
<p>INVENTORY ANALYSIS: Complete inventory analysis for three management units (Quesnel, Fort St John, TFL 18).</p>	<p>We completed inventory analysis for 1 of the 3 planned management units (Quesnel). Four additional analyses were completed (Robson Valley, Dawson Creek, Bulkley and Strathcona). Analyses planned for 2012/13 include TFL 18 and Fort St John (and several other units).</p>
<p>SITE PRODUCTIVITY: Determine status of site productivity information province-wide (PEM, TEM, SIBEC, SIA). Develop a site productivity plan. Conduct SIBEC sampling in Williams Lake and Morice. Conduct PEM accuracy assessment in Vanderhoof. Update BEC in Okanagan, Arrow, Merritt, Invermere/Cranbrook, and Lillooet. Complete PEM in Kootenay Lake. Improve access to site productivity data.</p>	<p>We assessed the status of site productivity information province-wide and prepared a 2011-12 site productivity work plan. We completed all of the planned SIBEC sampling, PEM accuracy assessment, and BEC updates. The PEM in Kootenay Lake was not completed. The completion of this PEM is now planned for 2012. We completed the planned work to improve access to site productivity data and developed an initial version of a province-wide site index GIS layer.</p>
<p>MONITORING: Provide expert assistance to FREP SDM. Design a program for monitoring young stand growth and yield in areas with high risk to mid-term timber supply. Prepare an implementation plan for 12/13. Remeasure 62 CMI plots, compile data, and report.</p>	<p>We provided expert assistance to the FREP-SDM program. We completed the design of a young stand monitoring program and completed the 2012-13 project implementation plan. We completed the re-measurement of 62 CMI samples and compiled the data, but did not complete the report. The report is now planned for 2012.</p>
<p>PSP: Communicate the need to check for and protect PSPs. Make publicly available compiled PSP data. Maintain and enhance PSP database pending system maintenance funding. Develop damaged PSP matrix</p>	<p>We communicated the need to check for and protect PSPs by way of a letter from the Chief Forester to District Managers and Regional Executive Directors. We posted a compiled PSP data set to our web site. Due to IT funding restrictions we did not maintain and enhance the PSP database. We developed a matrix for damaged PSPs and a new sampling methodology for damaged stands. In addition, we conducted field</p>

<p>and new sampling methodology for damaged stands.</p>	<p>visits to assess 167 PSP in Quesnel TSA and developed a PSP program annual work plan for 2012/13.</p>
<p>LVI: Complete the Quesnel pilot project, distribute results, evaluate the product, and plan next steps.</p>	<p>We completed an LVI-based re-inventory of western Quesnel TSA, documented the results in a report, distributed the data, and evaluated the method. We planned enhancements to the LVI method and selected a project area for 2012-13 (western Williams Lake TSA).</p>
<p>SPECIAL ANALYSES: Provide Softwood Lumber Arbitration team with information on location and severity over time of MPB attack. Provide custom analysis to guide LBIS investments. Provide 2011 remote sensing tile for the province and harvest change detection.</p>	<p>We provided BC's Softwood Lumber Arbitration team with information to support the arbitration. We provided LBIS with custom analysis to guide LBIS investments. We produced the 2011 remote sensing tile for the province and completed the 2011 harvest change detection for all areas with cloud-free imagery.</p>
<p>RESEARCH: Develop Beta test version of TASS III. Continue development and testing of SYLVER (TIPSY, Economist, Sawmill simulators). Advise on monitoring protocols, PSP data compilation, and other areas of expertise. Remeasure and maintain interior complex stand installations (Opax, Isobel Lake, Pothole Creek, Westwold).</p>	<p>We developed a Beta test version of TASS III. We continued developing, testing, and improving various components of the SYLVER system (TIPSY, Economist, Sawmill simulators). We advised on monitoring protocols, PSP data compilation, and other areas of expertise. We remeasured and maintained interior complex stand installations (Opax, Isobel Lake, Pothole Creek, Westwold). In addition, we provided 25,000 custom TASS runs to various clients across the province, and extension through numerous presentations and training sessions.</p>
<p>UPDATE/PROJECTION: Diagnose and develop plan to resolve problems with RESULTS cut-in and update. Update for fire. Extract data from provincial forest inventory. Project volume to 2011 (adjust volume for MPB kill and add biomass estimates). Produce public views. Review and streamline annual projection process.</p>	<p>We completed 4 of the 6 planned Update/Projection projects (all but fire update and streamlining the projection). Testing a new method for fire update and streamlining the projection are now planned for 2012. We examined the problems with RESULTS cut-in and implemented changes that reduced the backlog of harvest and silviculture updates. We completed the 2011 projection and posted a new inventory file by January 2012. This year the equivalent of 300 mapsheets (4.5 million hectares) of re-inventory was integrated into the inventory data set; 50,000 harvest and regeneration updates from RESULTS data were processed; and 970,000 polygons were adjusted to reflect the impact of mountain pine beetle.</p>

<p>INNOVATION: Analogue to Digital Transition (ADT) - Develop and pilot test the options for airborne and space digital image acquisition for VRI; and recommend strategy for transition from analogue air photo process to digital. Investigate potential of alternative imagery to improve photo-interpretation in MPB-killed areas. Evaluate a predictive inventory method.</p>	<p>We successfully completed 3 of the 4 planned innovation projects. We tested new options for VRI image acquisition, developed a strategy for conversion to digital photography, and investigated the potential of alternative imagery to improve photo-interpretation in MPB-killed areas. We completed the first phase of an evaluation of a predictive inventory method. In 2012 we will complete the final phase of the evaluation.</p>
<p>LBIS ADMINISTRATION: Plan and manage the LBIS-funded inventory program, including project and program planning, progress monitoring and reporting, and stakeholder engagement and communication.</p>	<p>We carefully planned and managed the LBIS-funded inventory program and the activities of the section as-a-whole. Annual work plans were developed for many program areas (VRI, site productivity, PSP, and NVAF) and for all major projects. Project progress was monitored throughout the year, reported quarterly to LBIS and summarized in several year-end reports. We engaged and communicated with stakeholders at the project level, through a series of stakeholder forums, via presentations and our e-newsletter, and in many other ways.</p>

3. Expenditures in 2011-12 by program area

Funding for approximately 94% of the section expenditures was obtained from the Land Based Investment Program. The remainder was provided by base funding, and internal and external research funding. The table below provides a breakdown of expenditure by program area.

Program area	Expenditure (\$)	Description
Evaluation of Emerging Technologies for Inventory Applications	\$ 70,100	Includes the acquisition and evaluation of high resolution satellite and air-borne imagery for various inventory applications, an evaluation of new photo interpretation tools and processes, MPB-stand model assessments, and statistical support.
Forest inventory - Ground Sampling and Analyses	\$ 855,763	Includes standard VRI audit sampling, NVAF sampling, and ground sample analyses
Forest Inventory - Monitoring	\$ 99,755	Includes the development of a young stand monitoring strategy and implementation plan, and re-measurement of 62 previously established monitoring plots in MPB-impacted management units

Forest Inventory - Photo Interpretation	\$ 3,210,037	Includes air photo acquisition for TFLs 14 and 23, Kamloops TSA, portions of Williams Lake and 100 Mile House TSAs, standard VRI photo interpretation and photo interpretation to support new/developing inventory methodologies
Inventory Projection/Database Maintenance/Contract Support	\$ 249,345	Includes the annual projection of the forest inventory database; data base updates including RESULTS integration and edits
Large Scale Digital Photo Acquisition (DSC)	\$ 160,000	These funds in addition to the Inventory Category \$5.5m LBI Budget
Site Productivity - Sampling, Analyses, Mapping	\$ 1,065,000	Includes SIBEC sampling, PEM, BEC updates, and assembly of a provincial site index GIS layer
GY Model Development and Maintenance	\$325,000	Includes \$65,000 external funding. Development of components of TASSIII, enhancements of TIPSY, improvements to FAN\$IER, and re-measurement of field installations.
Equipment	\$50,000	