
Vegetation Resources Inventory

Preparing a Project Implementation Plan for Photo Interpretation

Prepared by
Ministry of Forests and Range
Forest Analysis and Inventory Branch
for the Terrestrial Ecosystems Vegetation Task Force
Resources Information Standards Committee

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Digital Copies are available on the Internet at:
<http://ilmbwww.gov.bc.ca/risc/index.htm>

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The Resources Information Standards Committee evolved from the Resources Inventory Committee which received funding from the Canada-British Columbia Partnership Agreement of Forest Resource Development (FRDA II), the Corporate Resource Inventory Initiative (CRII) and by Forest Renewal BC (FRBC), and addressed concerns of the 1991 Forest Resources Commission.

For further information about the Resources Information Standards Committee, please access the RISC website at: <http://ilmbwww.gov.bc.ca/risc/index.htm>.

Preparing a Project Implementation Plan for Photo Interpretation

Table of Contents

Acknowledgments	iii
Introduction	1
VRI Planning.....	3
Project Implementation Plan Guidelines	5
Executive Summary	5
Section 1 - Introduction.....	5
Background Information	5
VRI Planning Process.....	5
State of the Current Inventory	5
Document Objectives	5
Landbase.....	5
Section 2 - Photo Interpretation Plan.....	5
Project Objectives.....	5
Target Area.....	6
Inventory Documentation and Archive	6
Calibration Data Sources	6
Polygon Delineation	6
Integrating RESULTS Information	6
New Field Calibration	7
Attribute Estimation	7
Mapping.....	7
Section 3 - Project Implementation	7
Project Pre-work meeting	7
Scheduling.....	7
Photo Scale and Coverage	8
Project Coordinator	8
Personnel	8
Quality Assurance	8
Deliverables.....	9
Reference Materials.....	9
Costs	9
Approval/Sign-off of VPIP.....	9

Preparing a Project Implementation Plan for Photo Interpretation

Appendix A: Needs Analysis.....	11
Appendix B: Documentation and Archive.....	13
Appendix C: Calibration Data Sources.....	15
Appendix D: Field Calibration Plan Guidelines	17
Appendix E: Project Schedule Guidelines	19
Appendix F: Project Completion Report	21

List of Figures

Figure 1 - Suggested Vegetation Resources Inventory Planning Process 4

Introduction

The Ministry of Forests and Range (MFR) has developed a business planning process to ensure the successful implementation of the Vegetation Resources Inventory (VRI) ground sampling and photo interpretation projects. This process includes development of VRI Strategic Inventory Plans (VSIPs) and Project Implementation Plans (VPIPs). This document provides guidelines that can be used to prepare a VPIP for photo interpretation projects. Guidelines for the preparation of VPIPs for ground sampling are available in a separate report.

The photo interpretation VPIP is a working document that details the specific operational activities associated with the implementation and documentation of the inventory project. It identifies the target areas for new photo interpretation, data sources, availability of existing aerial photographs or acquisition plan for new aerial photographs, format of base files, project scheduling, costs, deliverables, etc. The intent is that these guidelines will expedite the MFR VPIP standards and business review process while also generating documentation that will provide photo interpretation consultants with a basis to develop competitive contract submissions.

Included in this document is a description of the VRI business planning process and an outline of the VPIP document preparation guidelines. Appendices in the back of the document provide supplementary information and guidance in the development of the photo interpretation VPIP.

Development of a VPIP document is a fundable activity under the current Forest Investment Account (FIA) investment guidelines and is a component of the MFR VRI inventory standard.

Preparing a Project Implementation Plan for Photo Interpretation

VRI Planning

The VRI planning process involves developing VSIPs and VIPs that identify resource-specific management issues, desired inventory products and activities, and priorities (see Figure 1). A VSIP broadly outlines the VRI activities and products needed to address the identified forest management issues.

The photo interpretation VIP is a working document that details the specific operational activities associated with the implementation and documentation of the inventory project. It identifies the target areas for new photo interpretation, data sources, availability of existing aerial photographs or acquisition plan for new aerial photographs, format of base files, project scheduling, costs, deliverables, etc. Both VRI ground sample and photo interpretation inventories must be approved by the MFR to ensure that projects are completed to current standards, and to ensure the project meets the business needs of all identified stakeholders.

To facilitate an efficient and expedited approval of any of the VRI planning documents, it is essential that the proponent or project administrator contact the MFR Forest Analysis and Inventory Branch and Regional VRI Staff to involve them as early in the process as possible. Coordination between the proponent / project administrator and the Ministry will help to guide the determination of priorities and help to ensure that the business needs and considerations of as many stakeholders as possible are achieved.

Preparing a Project Implementation Plan for Photo Interpretation

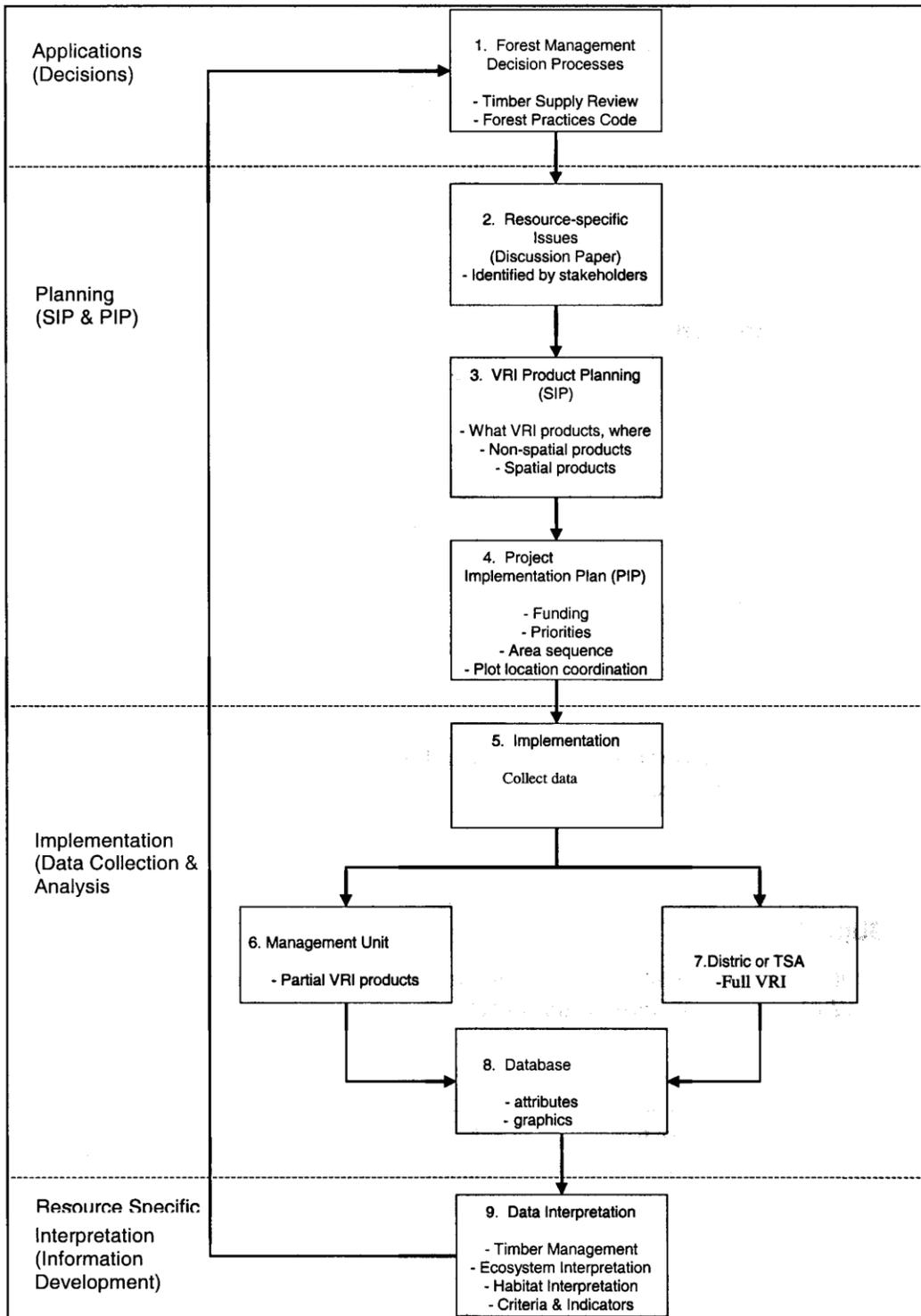


Figure 1 - Suggested Vegetation Resources Inventory Planning Process

Project Implementation Plan Guidelines

The following sections provide an outline and guidelines for preparing a photo interpretation Project Implementation Plan (VPIP) for management unit inventories.

Executive Summary

Section 1 - Introduction

Background Information

Briefly describe:

- the support of the stakeholders in the unit;
- why a new inventory is required and how this was determined (Timber Supply Review, habitat mapping, quality of inventory, etc.); and
- how the photo interpretation fulfills the information requirements.

VRI Planning Process

Describe how this document relates to the overall planning process and provide an overview of the VRI planning process.

State of the Current Inventory

Describe the format and quality of the inventory, age of the inventory, existing data deficiencies if any, results of the inventory audit if available, special surveys and results, etc.

Document Objectives

Describe the objectives of the VPIP document. What work is to be performed and why, how it will be managed, quality assured, and delivered to standard.

Landbase

Describe the land base in terms of geographic area, forest types, and administrative zones (such as the presence of Tree Farm Licenses, parks, woodlots or private land), population centres if any in the unit, biogeoclimatic zones present. Include a map and summary area statistics.

Section 2 - Photo Interpretation Plan

Project Objectives

Define the objectives of the photo interpretation project. VRI planning documents (*VSIPs*) or other relevant reports (*MFR AAC Rationales, LRMPs, Inventory Audits*) will provide guidance on the objectives of new photo interpretation. These documents outline forest management issues and inventory product needs identified by stakeholders in the management unit. If these planning documents are not available, a needs analysis must be undertaken. A needs analysis may also be necessary to confirm or refine the objectives in a *VSIP*. Guidelines for conducting a needs analysis are given in Appendix A. Project objectives must be clearly identified within the VPIP.

Target Area

Define the target area for the proposed photo interpretation in terms of full and partial map sheets (placed in an appendix), or geographic locations, including a detailed map of the target area. All portions of project maps within a Timber Supply Area (TSA) or other management unit must be completed to VRI standards. No holes, gaps or blank spaces shall exist in the data for the contiguous portion of the TSA or management unit on any map sheet completed as part of a VRI photo interpretation project. Include a detailed description of excluded areas if any, such as large parks, tracts of private land, etc. Provision of a GIS coverage defining the target to the MFR and those bidding on the work will ensure there is no ambiguity regarding the final deliverables. **Any exclusion to areas within a TSA or management unit must be negotiated with the MFR regional VRI representative.**

Inventory Documentation and Archive

Document the history of the existing inventory, digitizing history, quality, and availability of aerial photographs (document photos and new photos), format of base maps (TRIM), and data sources. This information is useful to potential contractors who will bid on the project. Guidelines for this documentation are outlined in Appendix B.

Calibration Data Sources

Data sources are used as calibration points for improving the quality of photo interpretation. An analysis should be undertaken that summarizes the status of the existing data sources, including all types of ground measurements and air observations. The analysis should be focused on the kind, frequency, distribution, age, completeness, and condition of the available data. Guidelines for this analysis are given in Appendix C. The analysis should also recommend the number and distribution of additional (new) air calls, ground calls and observations that are needed in the project area.

Proponents must establish a minimum of 10 ground calls, 20 air calls per map sheet equivalent. Field air and ground observations should be considered to provide additional information to interpreters. Any deviation from these numbers must be agreed upon by the Regional inventory forester and will be reflected in the calibration plan.

All existing data sources must be retained on, or transferred to the new graphics file except when a justifiable case can be made to remove them. Situations that would justify removal of existing data sources include a major disturbance (such as a large fire, harvesting or insect/disease damage), large stand structure changes, or as defined in the contract document.

Polygon Delineation

Polygon delineation is to be completed to VRI standards. Any deviation from these standards must be agreed to by the Regional inventory forester.

Integrating RESULTS Information

Special consideration must be given to the process of integrating RESULTS (silviculture) openings into the photo interpreted inventory. The MFR will provide a copy of the RESULTS shapes and attributes at the start of the photo interpretation contract. Photo Interpretation Guidelines for Integrating RESULTS Information are contained within the photo interpretation procedures.

New Field Calibration

Document the types of stands to be visited (specific species, old growth, second growth) or the targeted stand conditions that need to be the focus of new calibration work. As part of the deliverables, the MFR requires a complete set of any new data sources be provided in a suitable digital format (as determined by the MFR), including the geographical locations (UTM coordinates) of these data sources as well as the complete set of field attribute data collected.

Prior to the initiation of a field calibration program, a Field Calibration Plan (see Guidelines in Appendix D) is to be submitted to the MFR for review and joint MFR/recipient approval. Documentation within this sampling plan must include a map of the unit indicating the general location and distribution of the calibration points.

Local knowledge can be very useful in structuring a field calibration program. Proponents may want to consider discussing with licensees and MFR concerns such as drainage-specific knowledge of age ranges related to historic disturbance events, old growth patches, species distribution and history of events.

Attribute Estimation

Document the general process and format to be undertaken in the attribute estimation such as whether the project will be in softcopy (digital photogrammetry) or hardcopy (paper) format. If a softcopy project is to be undertaken, an indication of the absolute number or percentage of heights that will be digitally measured per map sheet should be indicated. If additional requirements are in place for the project, documentation must be provided as to the sequencing of the VRI and the other data collection.

Mapping

The MFR has developed a format and database standards for the submission and storage of spatial and attribute data for VRI Photo interpretation. All new projects must be completed to this standard and submitted to the appropriate Regional Inventory Forester following successful QA.

Section 3 - Project Implementation

Project Pre-work meeting

The purpose of a project pre-work meeting is to bring together the FIA recipient, the project coordinator, contractor and, MFR representatives and Quality Assurance Personnel prior to project start-up. This meeting will be recipient-led and will ensure that an efficient communication network is established, identify individuals responsible for all aspects of the project, allow discussion of any issues before project starts and establish timelines for deliverables and data flow. Minor changes to the contract to complete the phase 1 activities may be identified at this meeting.

A project pre-work checklist, signed off by all parties attending, is used to organize and guide the meeting.

Scheduling

Outline in detail the activities and roles and responsibilities needed to implement the project. Suggested guidelines are available in Appendix E.

Photo Scale and Coverage

For traditional photo interpretation using hard copy photographs, the minimum acceptable photo scale is 1:15,000 colour or black and white.

For projects utilizing digital softcopy photogrammetric technology, the minimum acceptable scale of the imagery shall be 1:20 000 for coastal areas; 1:20 000 for southern interior and central interior areas; and 1:30 000 for portions of the far northern interior. The use of digital imagery requires the use of a Ground Sampling Distance that is compatible to the minimal acceptable scale in hard copy. The MFR must be consulted in regards to the appropriate photo-scales or Ground Sampling Distance to be implemented on a project.

The year(s) of photograph acquisition for the project area must be included and approved as part of the Plan. As a guideline, the maximum age of the photographs is five years from the date of the start of attribute estimation. Acceptance of older photographs to fill in small information gaps must be reviewed in consultation with the MFR.

The acquisition of aerial photographs that are intended to be used in the VRI program must meet the specifications of and be approved by the GeoBC section of the Ministry of Agriculture and Lands. Aerial photographs flown outside of the BC government flying program must be approved before work may commence on the photo interpretation component. Consideration must be given to the time required to obtain this approval when developing the schedule for the completion of the photo interpretation project.

Project Coordinator

The project coordinator and their responsibilities should be identified in the plan. Responsibilities usually involve: coordinating the project; monitoring and communicating project progress; ensuring all contractors are qualified and certified; overseeing photo-interpretation activities; ensuring quality assurance is complete and delivered at each stage, and assisting in coordinating technical expertise where required.

Personnel

All VRI photo interpretation work conducted in British Columbia must be completed by or directly supervised by a VRI Certified Photo Interpreter. At least 50% of the photo interpreters working on a VRI project must be certified for VRI photo interpretation. All uncertified photo interpreters are to be directly supervised by a Certified Photo Interpreter working on that project. An indication of the desired qualifications and/or level of experience of the photo interpreters should be indicated in the VPIP.

For projects where TEM or terrain will be completed at the same time as the VRI program, an indication of the qualifications of the individuals completing the other project requirements must be identified.

Quality Assurance

The Project Coordinator must ensure that the Quality Assurance contractor is present at the initial project pre-work meeting held between the VRI consultant, MFR and Licensee. The QA contractor must conduct quality assurance on all phases of the VRI that is undertaken during the entire fiscal year when dealing with multi-year inventory projects.

Quality Assurance must meet or exceed MFR quality assurance standards for VRI photo interpretation on each phase of the VRI Photo Interpretation process, and all reports must be submitted immediately to both the project coordinator and the regional MFR representative.

Deliverables

List the deliverables to be submitted at the end of each fiscal year and at the completion of the project. These deliverables are explained in detail in the appropriate VRI standards documentation and are briefly listed below.

- Digital attribute and spatial data
- Digital and hard copy calibration data
- QA documentation
- Project completion report (Appendix F) and annual progress reports for multi-year projects
- Additional non- standard deliverables

Reference Materials

Indicate the reference materials that could be used by the photo interpreters in the completion of the project. Rather than referencing specific version numbers of documents, it may be best to reference documents as the “Current Version” of the name of the document without the version number.

Costs

Indicate the anticipated or estimated costs for completing the project including photo acquisition, quality assurance, data capture and field costs based on the level of field calibration to be completed.

Approval/Sign-off of VPIP

The VPIP must be reviewed by the MFR to ensure all appropriate standards are being followed and to ensure the scope of the project will meet their business needs. The sign-off contact for the MFR and suggested wording for the sign off is:

XXX Timber Supply Area Vegetation Resources Inventory Ground Sampling Project Implementation Plan

It is the intention of the proponent to implement the XXX Timber Supply Area Vegetation Resources Inventory Photo Interpretation Project Implementation Plan (VPIP) as described. As a key stakeholder in the inventory, Ministry of Forests and Range (MOFR) VRI staff has been consulted throughout the development of this plan.

Lead Proponent Name
Title,
Company
Location

Date

I have reviewed the XXX Timber Supply Area Vegetation Resources Inventory Ground Sampling Project Implementation Plan. I will be advising Pricewaterhouse Coopers that the work proposed in this plan meets Vegetation Resources Inventory standards and MOFR business needs.

Manager Name
Manager,
Forest Inventory Section
Forest Analysis and Inventory Branch
Ministry of Forests and Range

Date

Appendix A: Needs Analysis

A needs analysis is not needed if a VSIP has already concluded that new photo interpretation is required. However, a needs analysis may be necessary, in some cases, to confirm or refine the photo interpretation objectives identified in a VSIP. Identifying what needs to be improved (attributes or delineation), where, and how, involves the following three steps:

- **Identify the needs.** Identify and consult stakeholders to define forest management issues and inventory product needs. The stakeholders may include local planning groups and the users of the inventory. Review recent Timber Supply Review reports and other related documentation.
- **Identify priority areas within the target area.** Develop and apply criteria for ranking areas based on the management needs.
- **Review the existing inventory.** This involves quantitative evaluation of the attributes and the delineation, an assessment of calibration data sources, and a review of existing photos, maps, and technology.

Quantitative Evaluation

Evaluate the existing photo estimates and delineation. This assessment involves consideration of many factors, including:

- Number and age of unit surveys on which the current inventory is based (classification standards can vary significantly between surveys).
- Quality of the document photos used for photo interpretation.
- Stand complexity, in terms of stand structure and the average number of species per type (how difficult is the photo interpretation?)
- Frequency and distribution of data sources.
- Ratio of immature to mature stands.
- Frequency of stands with a high probability for structural or successional change between inventories.
- Current and future data needs for forest management – will the descriptive data now in the database meet management needs?
- Priority strata, attributes, and geographic areas identified for special attention by resource users.
- Kind and frequency of disturbances since the last re-inventory.
- Quality of the classification of non-forest attributes.

The assessment should be extensive and comprehensive enough to determine:

- Whether the current classification standards for stratification and type descriptions are being met for each unit survey, forest cover stratum, and descriptive attribute.
- The short and long-term requirements for improving the inventory.

Assessment of Stand Attributes

Assess the accuracy of stand attributes using the inventory audit data or similar study information. If an inventory audit has been completed for the project area, briefly summarize and discuss the results of the audit.

The conclusions of the assessment should state:

Preparing a Project Implementation Plan for Photo Interpretation

- What improvements are necessary;
- What and how much work is needed to make those improvements; and
- Where to distribute the work.

Also, check the consistency of the old estimates to identify the potential statistical benefits of completing new photo estimates. (New estimates may not be any better than the old estimates for the purpose of statistical adjustment.) To check the consistency of the old estimates, new estimates should be derived for the sample polygons in which the sample clusters fall. Regression relationships between the old and new estimates and the ground measurements would then be compared. This process should be done using one photo interpreter to provide consistency among estimates. Existing polygon boundaries would be maintained.

Stand Delineation

Assess if current stand delineation meets the new criteria and standards. This assessment could result in the recommendation of (with reasons) one or more of the following options for a given area: no action, an update for disturbance, or new delineation.

Appendix B: Documentation and Archive

Inventory Status

This section describes the history and other relevant details of the current inventory. Summarize the surveys on which the current inventory is based. Information on each unit survey conducted should include the year and the kind of survey (e.g., reinventory, update, ESA, EPA).

A reference map may be prepared to show:

- Boundaries of previous inventories on which the current inventory is based (include project names and corresponding reference year).
- Boundaries of ESA/EPA surveys and reference year(s).

Summarize the potential classification inconsistencies originating from the previous inventories.

Digitizing History

For each unit survey, list the year of digitizing and the method used for entering forest cover details [detailed forest cover attribute lists (FS 810) or generalized direct label entry].

Aerial Photographs

Summarize the photo specifications and characteristics that could affect the quality of photo interpretation for the document photos by unit survey, and for new photography, if it is available.

Photo Coverage

A complete list of document photos and new photography should be provided. A photo key map highlighting the photos available will also be useful.

Photo Specifications and Quality

Vital information on document and new aerial photographs includes year of photography, scale, photo colour, direction flown, quality of photos, and identification of missing photos. This information should be presented for both the document and new photos.

Base Maps

Review and summarize the status of the base maps and plotting needs. The overriding fact regarding base maps is whether the maps are available in TRIM (NAD 83) format. Other important considerations for each base map are discussed below:

- Show the latest year the base maps were updated for ownership and cadastre, planimetry, and forest cover.
- Identify any maps in the project area that are being modified or updated on another contract, including mapsheets which are adjacent to the project area and mapsheets that border other Forest Regions or Districts. List the maps and highlight them on a map index key map.
- Identify TRIM maps available for an inventory update or reinventory.

Information and data that may contribute to the inventory will come from a wide variety of sources and may have been prepared over a long period of time. Special consideration may need to be given to the following aspects of source preparation, digitizing, and plotting:

Preparing a Project Implementation Plan for Photo Interpretation

- Are there planimetric changes, i.e., rivers, roads, or glaciers to plot?
- Considering the age of new classification photography, the rate of disturbance and year of update for planimetry, is a satellite update required?

Special Studies or Surveys

The client interviews may reveal information about special studies such as old history records, fish and wildlife studies, soil sensitivity studies, and terrain mapping projects which may be useful if they are available.

Appendix C: Calibration Data Sources

Existing (Historical) Data Sources

Conduct a quantitative assessment and summarize all existing data sources for the project area by type of data source (air calls, ground call, permanent samples, temporary samples, etc.), frequency, year of establishment, completeness, and condition. Check the data sources and provide an indication of their overall quality if possible. Regional inventory staff may need to be contacted to provide guidance and support in this process.

Cruise Plot Data Sources

Cruise plot data from unlogged timber sales can be used as calibration points. Determine the number of unlogged cutblocks and the potential number of current and valid cruise plots available to be summarized and transferred to the new photos. Check the availability, suitability, condition, and compatibility of cruise plot data for use in calibration. Also, note how accurately the cruise plots are mapped because this will influence how well they can be transferred to the new photos.

Other Resource Data Sources

There are several types of non-timber surveys that can be used for improving forest classification or other resource overlays. These surveys are not to be confused with the resource overlay information identified in the section on digitizing history. Surveys that may be available can be identified during the client interviews.

Review the availability and suitability of non-timber surveys that could be incorporated into an inventory update or reinventory. This resource information may include wildlife habitat, recreation, watersheds, fisheries, soil sensitivity, and harvesting operability classification. A summary of other resource surveys should include:

- Kind, scope, and number of surveys available.
- Data reliability and compatibility.
- How the data can be incorporated.

Preparing a Project Implementation Plan for Photo Interpretation

Appendix D: Field Calibration Plan Guidelines

Objectives

Field Calibration Plans (FCP) are required to ensure consistency between the proposed field calibration points and the requirements for additional information in the project area. The FCP is based on the Vegetation Strategic Inventory Plan (VSIP) which will include:

- a) Data source analysis from previous inventories. This is carried out to indicate where data sources may be considered less reliable or non-existent.
- b) Consultation with proponents regarding management concerns.

The FCP will include calibration points that will assist the photo interpreter to correlate the vegetation attributes on the ground with those on the air photos (e.g., complex multi-layered stands).

Approval process and plan content

Prior to the commencement of any field data collection, the recipient must submit to their respective Ministry of Forests and Range (MFR) Inventory Forester the FCP for approval. After successful review, written approval will be provided to the recipient. The plan should include:

- a) An Excel spreadsheet showing the distribution of calls by age class, leading species and any calibration points pertaining to items identified in the VSIP.
- b) The number and type (1 point and/or 3 point clusters) of calibration points proposed. Often more points than required to meet the target may be pre-selected to allow for operational issues such as limited access.
- c) Designated staff who will be carrying out the field work including both air and ground calls.

Mapping Requirements

- a) A submission format of a single shape file (.shp).
- b) All map sheet boundaries and map sheet ID.
- c) Include the following map features:
 - Major Water Features -solid blue, line weight 0.5
 - Major Roads -dashed red, line weight 0.5
 - Proposed Air Calls with call # -orange, Font 8
 - Proposed Ground Calls -yellow, Font 8

Each Air Call and Ground Call will be indicated with the following symbol:

Air Calls - ◇

Ground Calls- ●

Preparing a Project Implementation Plan for Photo Interpretation

Appendix E: Project Schedule Guidelines

The following information is presented as a general guideline and can be modified based on the specific requirements of individual projects.

Preparation

1. Select administrative or management unit (September/October):
 - Timber Supply Area (TSA), Forest District, Tree Farm License (TFL), Park.
2. Conduct preliminary review (October to January):
 - Evaluate inventory, audits, strategic planning issues, management/government action issues;
 - Arrange for Terrain Resource Information Management (TRIM) bases ;
 - Ensure that photos are available; and
 - Obtain updated overlays.
3. Define project area (January):
 - Determine objectives;
 - Determine limits of project area;
 - Finalize project priorities; and
 - Conduct stakeholder review.

Work Plan

1. Identify activities needed to meet project objectives (January/February).
2. Acquire funding.

Viewing

1. Identify contract evaluation team (January/February).
2. Develop viewing materials (January/February):
 - Source material:
 - i. Maps (TRIM and traditional forest cover)
 - ii. Photos (new and source)
 - iii. Global Positioning Satellite (GPS) traverse of roads and silviculture opening boundaries
 - iv. Silviculture information
 - Request for Proposals (RFPs):
 - i. Identify eligible contractors; and
 - ii. Prepare RFP packages for contractors.
3. Prepare for viewing (February).
4. Conduct the viewing for photo interpretation contract (end of February).

Preparing a Project Implementation Plan for Photo Interpretation

The Contract

1. Develop and submit bid proposal (February/March).
2. Award the contract (March):
 - Contract evaluation team compiles and evaluates proposals; and
 - Award the contract for photo interpretation.
3. Post contract award and contract implementation:
 - Fulfill WorkSafeBC / safety requirements; and
 - Data transfer, polygon delineation and quality control (March to May)*.
4. Conduct field work (May to August)*:
 - Prepare for field work (May);
 - Pre-work meeting and site familiarization;
 - Conduct field work: air calls and ground calls (June to August);
 - Internal quality control; and
 - Quality control field work.
5. Photo interpretation (September to January)*:
 - Polygon attribute estimation and data entry; and
 - Quality control photos.
6. Quality assurance (September to April)*:
 - Polygon transfer; and
 - Quality assurance of data and graphics, and acceptance (February to April).

* **Note:** These time frames are totally dependent on the contract area, the number of photos to be used for the contract area, and field accessibility. Flexibility is required in planning when these activities, and consequently the project, are to be completed.

Appendix F: Project Completion Report

The following information is presented as a general guideline and can be modified based on the specific requirements of individual projects.

Project Completion Report

Phase 1 - Vegetation Resources Inventory (VRI)

Photo Interpretation and Digital Map Production

of

XXXX TSA / TFL

Prepared By

Signoff

Date

Preparing a Project Implementation Plan for Photo Interpretation

Purpose

The purpose of this report is to document and provide a historical reference of the area of interest, personnel and activities associated with the completion of a VRI Photo Interpretation project.

1. Introduction

Provide a brief description that includes:

- Reference to the approved VSIP / VPIP;
- Start-up date and timeframe required to complete the project;
- Lead Licensee, groups or other name, who initiated the project;
- Logic for doing a VRI Phase 1 (brief);
- Contractor company(s) awarded the contract; and
- Funding through FIA or other source.

In the event that more than one VRI contractor is awarded a portion of a TSA/District/TFL, then each will complete this report for their appropriate area.

2. Project Area Description

Provide a general description of where the area of interest is located within the province.

- Document should contain a project area map.
- Should reference a listing of BCGS maps or portions of maps or an appendix containing a list of all maps or portions thereof, included within the project.

3. Personnel

List all personnel utilized by the company involved (with qualifications) and their roles in this VRI including third-party quality assurance.

4. Air Photo Coverage/Format

Identify photo coverage used and formats including but not limited to:

- Year and scale of photography;
- Colour or black and white imagery;
- Preset model format (sjs or other) if softcopy was used;
- Any gaps in photo coverage in the area and what was done with holes in coverage;
- If different scales, GSD's (ground sampling distances - digital camera) are involved, and which maps are effected by each scale; and
- Scanning rates.

5. VRI Assessment

Logic on the need for this VRI project which could include: recommendations from the Chief Forester, licensee or other authority; forest management issues identified in the VSIP or other planning documents; age of previous inventory; defined need for a new inventory or other assessments.

6. VRI Phase 1 Photo Interpretation Process

This section will describe the range of aspects related to the capture of the new photo interpreted inventory.

6.1 General Comments

Provide a standard statement that all procedures (unless explicitly stated otherwise) conformed to Provincial VRI Standards. If not, describe variances to the standards or any changes that were incorporated including but not limited to whether the entire area was completed or only portions, and identify what portions were included or excluded. This section should also indicate whether softcopy of hardcopy prints were used.

6.2 Inventory Base Maps

Identify whether the TRIM base was used or not and any processes used to prepare the base for VRI in a softcopy environment.

6.3 Data Source Analysis

Identify what was done to recover or assess historic data sources (air calls, ground calls, PSP, TSP) and what success was achieved. This would include a statement or table on the amount of historic data sources transferred or why some were not transferred (such as the original data source information could not be found, the age of the information, etc.).

6.4 Polygon Delineation

This section is to include but is not limited to whether:

- Private lands, woodlots or other features were excluded from delineation;
- Other inventory processes such as bioterrain, TEM, etc. were used as a base for or supplementation to the VRI delineation. If so, what criteria were used to insert the VRI over this base;
- A desired or predefined polygon size or number of polygons per map was targeted strived and the logic for this decision;
- The project was completed to TSA/TFL boundaries not necessarily to the map sheet boundary; and
- Any maps or portions were not delineated because of incomplete or missing imagery.

6.5 Field Calibration Data Collection

6.5.1 Field Calibration Plan

Indicate whether a field calibration plan was completed, who completed it, who reviewed it and who signed it off.

6.5.2 Candidate Stand Criteria

Indicate the priority candidate types that were targeted for field calibration based on the information in the planning documents, contract documents, etc.

6.5.3 Data Collection

This section should provide an indication of how the data was collected. Information should indicate whether GPS data was collected for all field locations and how this was collected. This section should also document whether the location of the field calibration points were marked on hardcopy photos, the orthophoto or a copy of the

forest cover map and how this information was transferred to the digital data base. It should also be indicated whether the data was collected on traditional hardcopy forms or through digital means.

6.5.3.1 Air Calls and Ground Calls

Indicate the number of air calls completed and general types of data collected at each of these points. Also indicate the number of one point, three point and ground observation ground calls completed and the general rationale behind why a one point call was completed instead of a three point call or vice versa. Indicate whether the field work sample plan was followed and provide reasoning behind any changes that happened to the plan.

6.5.3.2 Air Observations and Ground Observations

Indicate the number of data points recorded and provide a general indication of the types of data collected at the air observations and the ground observations.

6.5.3.3 Data Description Format

- Were all calibration data points transferred to the digital data base?
- What was the disposition of the data? Specifically, where is any hardcopy photo, orthoimages, maps, forms, etc. containing this data being stored?
- Was a digital field data list with UTM or latitude/longitude co-ordinates (Excel or other format) completed to MFR requirements and delivered to the MFR?

6.6 Attribute Estimation and Cover Descriptions

6.6.1 Final Attribution

This section should indicate the process used to assign attributes to the vegetation cover polygons. Items to consider include a description of how the polygon numbering was completed; whether all of the polygons were attributed with full VRI descriptions and if not, what was the rationale behind this decision and who approved it; were all lands included in the attribution (such as private lands, woodlots, etc.) Any other discrepancies or variances to the standard must also be included.

As well, it should be indicated how the attribute information was entered into a digital medium (MFR software or custom application) and the process used to validate the data. If the data was entered using something other than the MFR software, indicate the process used to convert that information to the VRI database format.

It must also be indicated whether polygon line work (delineation) and attributes were edge tied to adjacent map sheets including VRI line work and attributes in adjacent projects (such as previously completed TSAs.)

Were photogrammetric height measurements taken, and where are they stored?

6.6.2 Silviculture Information

How was the information from silviculture openings incorporated into the VRI? This is to include but is not limited to:

- External opening boundaries derived from new photography;
- Internal opening polygon boundaries derived and maintained from an existing inventory update;

Preparing a Project Implementation Plan for Photo Interpretation

- Internal opening polygon descriptions maintained from an existing inventory, and
- Stands identified as free growing where a complete VRI description is required.

6.7 Digital Map Production

Information included in this section will document the completion of the digital mapping for the project. The version of digital mapping standards used must be indicated as well as the digital mapping process, including but not limited to:

- Confirmation that all polygons were noded after line transfer;
- Confirmation that the planimetry and cadastre were updated and annotated with appropriate toponyms and description;
- Confirmation that the new files were vector and polygon cleaned and then compared to the associated VRI attribute files to ensure a one-to-one polygon correspondence;
- Confirmation that all maps are in single neat line format; and
- Any other aspects of the digital map production process.

7. Deliverables

Include a listing of all deliverables, and to whom and when they were delivered.

8. Quality Assurance

A detailed description of the quality assurance process used must be provided including a summary of results achieved by phase (polygon delineation, field work, attribute estimation.) This section must also indicate who was responsible for completion of the quality assurance. Any Quality Assurance issues and their resolution should be documented.

For any work that did not achieve the standards, it must be indicated what was done to remedy the situation, whether it was corrected, and any remedial measures to ensure that similar errors did not occur again in the project.

9. Costs

Project costs should be broken out by phase (as much as possible) such as polygon delineation and data source transfer, field work, final attribution, and digital mapping. Where possible, separate costs for the quality assurance component should be indicated, otherwise this can be included in the cost for each appropriate phase.

10. Conclusion and Recommendations

This section allows for the indication of any problems that were encountered in the project and any recommendations to be considered in future projects. These could be associated with the project start-up and availability of data to start the project, issues regarding photo quality, scale, different scales and incomplete photo coverage.

Other items to consider include changes in staffing midway through the project, insufficient field work to assist in the attribute estimation or areas where more work might be required to generate a more valuable product. It also may be appropriate at this point to document any issues with the polygon delineation or attribute estimation in problem areas such as dry belt fir stands, low productivity coastal polygons, spruce-balsam types, etc.

11. Potential Attachments

Attachments provide valuable insight into the completion of the project and can quickly summarize the project status, problems encountered, work completed, etc. The types of attachments include but are not limited to:

- A list of the map sheets included in the project or alternatively, a map indicating those areas included in the project;
- The existing data source analysis if completed;
- A copy of the field calibration sampling plan; and
- Any other documents or attachments that could add value to future users of the data.