Forest Investment Account

Ministry of Forests and Range

Forests for Tomorrow

Ministry Survey Standard
Effective April 1, 2008

These standards apply, in addition to the General Standards for Ministry Funded Programs (FS 1001), to all survey activities funded under Ministry Programs.

CONTENTS

ARTICLE 1: GENERAL STANDARDS 1
- Definitions 1
- Information and Materials Furnished by the District Manager 2

ARTICLE 2: PERSONNEL 2
- Crew Qualifications 2
- Inspector's Qualifications 2

ARTICLE 3: STANDARDS APPLICABLE TO EVERY SURVEY 3
- General 3
- Survey Lines and Plots 3
- Format of Documentation 3
- Recommendations 3
- Survey and Treatment Maps 4
- Survey Maps - Additional Requirements 4
- Treatment Maps - Additional Requirements 4

ARTICLE 4: STOCKING, PLANTABILITY AND FREE GROWING SURVEYS 4
- Requirement for a Plantability Survey 4
- Stratification Criteria 4
- Brush Assessment 5
- Free Growing Assessment 5
- Required Forms, Maps and Photography 5

ARTICLE 5: SURVIVAL SURVEYS 5
- Stratification Criteria 5
- Sampling Specifications for New Surveys 5
- Required Forms and Maps 6

ARTICLE 6: PRE-STAND TENDING SURVEYS 6
- Stratification Criteria 6
- Required Forms and Maps 6

ARTICLE 7: INSPECTION 6
- Quality Inspection - General 6
- Inspection Method 7
- Satisfactory Work Quality Defined 7

ARTICLE 8: REQUIRED REPORTS & RECORDS 8
- General 8
- TFL's, CFA's 8
- TSA's 8

ARTICLE 9: Submission into Results 8
- General 8

ARTICLE 10: Activity Specific Survey Standards 8

ARTICLE 1: GENERAL STANDARDS

Definitions

1.1 In this document the following words shall have the following meanings.

(a) **"Accredited Silvicultural Surveyor"** means a person who is registered with the Forest Practices Branch of the Ministry of Forests as an Accredited Silvicultural Surveyor.

(b) **"Approved Surveys Quality Inspection System"** or **"Approved SQI System"** means the inspection system contained in this Document **or** another similar system approved in writing by the District Manager or, for the FFT Program, the regional FFT forester, prior to the commencement of Work.

(c) **"Crew"** means one person, or two or more persons working with each other in the same Opening.

(d) **"Crop Tree Standards"** means, in the absence of Stocking Standards, regional or district issued or approved guidelines which define acceptable crop tree characteristics.

(e) **"Multi-storey Stand"** means a stand with a mature or pole layer present in combination with a sapling and/or regeneration layer.

(f) **"Opening"** means an area identified on a vegetation resources inventory map by an opening number.

(g) **"Survey Map"** means a map produced according to the specifications in Article 3.

(h) **"Silviculture Treatment Recommendation"** means a logical, biologically-sound, cost-effective recommendation, based on survey results and anticipated stand development, which specifies what if any, future Surveys and silviculture treatments are required for a Stratum, and which also specifies the year and season during which any such Survey or treatment should take place.

(i) **"Stratification Criteria"** means the criteria set out in these standards, the *Stocking and Free Growing Survey Procedures Manual*, or as may be specified by a District Manager.

(j) **"Stocking Standards"** means the stocking requirements applicable to a Work Area that are stated in a Treatment Plan or Work Plan.

(k) **"Stratum"** or **"Strata"** means, respectively, a Survey area or areas for which the boundaries are determined by the Stratification Criteria for the type of Survey referenced.

(l) **"Survey"** means, as the context requires, a stocking, plantability, free-growing, survival or pre-stand tending survey as set out in the *Stocking and Free Growing Survey Procedures Manual* and includes the collection and analysis of field data, and all forms, maps, reports, photographs and Silviculture Treatment Recommendations required by the Ministry Standards, FIA Standards or FFT standards.

(m) **"Treatment Map"** means a map produced according to the specifications in Article 3.

(n) **"Vegetation Resources Inventory Map"** means a Vegetation Resources Inventory Maps maintained by the Ministry of Forests and Range or by a holder of a Tree Farm Licence or Community Forest Agreement.

Information and Materials Furnished by the District Manager

1.2 At the request of the Recipient, the District Manager will provide:

(a) where they exist, any Treatment or Work Plans applicable to the Openings;

(b) where Treatment or Work Plans do not exist, the Crop Tree Standards to be applied to the Openings;

(c) copies of the Vegetation Resources Inventory Maps having the Openings to be surveyed;

(d) applicable aerial photographs, subject to any conditions of use that may be attached; and

(e) all other available information considered by the District Manager to be pertinent to the Work.

ARTICLE 2: PERSONNEL

Crew Qualifications

2.1 Each Survey Crew must include at least one Accredited Silviculture Surveyor and all personnel performing the Work must be familiar with the Silviculture Treatment Recommendation options that are appropriate and generally considered acceptable for the area.

Inspector's Qualifications

2.2 All Work must be inspected by a person (the "Inspector") who is:

(a) the Registered Professional Forester (RPF), or operates under the direction of the RPF, who will sign and professionally seal reports for the Work;

(b) experienced and competent in conducting Surveys;

(c) familiar with the Treatment Plans and Work Plans for the Openings;

(d) familiar with appropriate Silviculture Treatment Recommendation options; and

(e) who did not undertake the Surveys.

ARTICLE 3: STANDARDS APPLICABLE TO EVERY SURVEY

3.1 The standards of performance in Article 3 apply to every Survey.

General

3.2 All Surveys must be in accordance with the Ministry Standards, FIA standards or FFT Standards, including any standards or specifications stated or implied in the Approved SQI System which forms part of the Ministry Standards, FIA standards or FFT Standards.

3.3 Unless otherwise specified in the Ministry Standards, FIA standards or FFT Standards, surveys must be in accordance with the *Stocking and Free Growing Survey Procedures Manual*.

3.4 Surveys must collect the information necessary to complete the required forms for each Survey type.

Survey Lines and Plots

3.5 Survey lines and plots must be marked as follows:

(a) point of commencement (P.O.C.) and point of termination (P.O.T) marked with flagging tape showing the P.O.C. or P.O.T. number in waterproof ink;

(b) survey baseline (if established) and all strip lines marked with flagging tape showing the baseline and stripline number in waterproof ink;

(c) flagging tape affixed to the ground at all plot centres; and

(d) flagging tape affixed at a height of approximately 1.3 meters above each plot centre, showing in waterproof ink the plot number, date of survey, and bearing and distance to next plot.

3.6 The number of plots per Stratum must be in accordance with the “Statistics” section of the *Stocking and Free Growing Survey Procedures Manual*.

Format of Documentation

3.7 Where Survey data or results are summarized or represented using computerized or other electronic means, the display, content and format of the information must substantially duplicate the corresponding Ministry of Forests form and its respective procedural requirements.

Recommendations

3.8 Subject to the outcome of a Survey, Silviculture Treatment Recommendations must be developed in accordance with:

(a) the procedures in the *Stocking and Free Growing Survey Procedures Manual*;

(b) the Ministry of Forests’ Backlog Cost Guidelines;

(c) the Treatment Plan for the Opening, if one exists; and

(d) if a Treatment Plan does not exist, the Crop Tree Standards appropriate for the area and applicable tree species.

3.9 If a Treatment Plan held by the District Manager appears to require an amendment, the Recipient must make the recommendation to the District Manager.

3.10 A backlog area that a Survey indicates to be free growing should be declared free growing on the applicable Ministry of Forests reporting document.

Survey and Treatment Maps

3.11 Survey and Treatment Maps must:

(a) be submitted in accordance with the British Columbia Mapping Standards for use in RESULTS submissions.

Survey Maps - Additional Requirements

3.12 In addition to the requirements of section 3.11, Survey Maps must also show:

(a) points of commencement and termination of the survey;

(b) survey lines with numbers and direction traveled;

(c) plot centres numbered at least every fifth plot;

(d) the boundaries and name of each ecosystem site series;

(e) Opening and Strata area;

(f) the locations from which each 35 mm photo was taken and an arrow indicating the direction of the photo image from that location; and

(g) the type of Survey.

Treatment Maps - Additional Requirements

3.13 In addition to the requirements of section 3.11, Treatment Maps must also show:

(a) treatment unit boundaries and identifiers;

(b) Silviculture Treatment Recommendations;

(c) the direction and distance to nearest town; and

(d) gross and net treatment area.

ARTICLE 4: STOCKING, PLANTABILITY AND FREE GROWING SURVEYS

4.1 The standards contained in this Article apply to stocking, plantability, and free-growing surveys in addition to the standards specified in Article 3.

Requirement for a Plantability Survey

4.2 If a stocking or free growing survey indicates that a Stratum is not satisfactorily restocked, a plantability survey must also be conducted on the Stratum.

Stratification Criteria

4.3 All one (1) hectare or larger areas of an Opening which are significantly different from the surrounding area must be stratified into relatively homogeneous Strata based on:

(a) previous Treatment Plan stratification;

(b) standards unit;

(c) stocking status;

(d) inventory components;

(e) previous and recommended treatments;

(f) site series (ecosystem association), where the site series identified have different Stocking Standards;

(g) harvesting and silviculture treatment history;

(h) stand structure (e.g. even-aged vs. Multi-storey);

(i) forest health factors; and

(j) free growing status.

Brush Assessment

4.4 For each Stratum, brush severity must be assessed using the following codes.

HIGH - brush has encroached on some of the crop trees; control will be necessary

MED - brush will encroach on some of the crop trees, control may be necessary in the future

LOW - some brush present but no anticipated problem

NIL - no brush hazard present

4.5 If not a free growing survey, the species, percent cover and height of competing vegetation need only be recorded at the first and every fourth sample plot thereafter.

Free Growing Assessment

4.6 In a free growing survey, preferred and acceptable trees in a plot must be assessed for free growing in accordance with Appendix 9 of the *Establishment to Free Growing Guidebook* for the forest region.

Required Forms, Maps and Photography

4.7 Survey information must be recorded and evaluated as follows.

(a) Survey information must be recorded on the appropriate silviculture survey (FS 657) and silviculture survey plot forms (FS 658).

(b) A silviculture survey summary form (FS 659) must be completed for each Stratum, summarizing all information recorded on the field survey forms (FS 657 and FS 658), and specifying Silviculture Treatment Recommendations for the Stratum.

(c) Survey activity and forest cover polygon submission for each Opening must be submitted into RESULTS.

4.8 One colour photograph must be taken, showing a representative view of each Stratum. Photographs for an opening must be placed in a pdf file and attached into RESULTS opening file.

ARTICLE 5: SURVIVAL SURVEYS

5.1 The standards contained in this Article apply to survival surveys in addition to the standards specified in Article 3.

Stratification Criteria

5.2 All one (1) hectare or larger areas of an Opening which are significantly different from the surrounding area must be stratified into relatively homogeneous Strata based on:

(a) ecosystem site series;

(b) tree species;

(c) seedling stock type;

(d) seedlot;

(e) nursery at which stock was grown; and

(f) method of site preparation.

Sampling Specifications for New Surveys

5.3 Survival surveys using the staked plot method must use circular sample plots having a radius of 3.99 metres (0.005 hectares).

5.4 Survival surveys using the staked line method of Survey, must have a minimum of four lines of 25 trees within each Stratum.

5.5 Staked trees (in lines or plots) must be evenly distributed throughout each Stratum in order to obtain Survey data which is representative of the Stratum.

5.6 A minimum of 100 trees in each Stratum must be staked and assessed.

Required Forms and Maps

5.7 Survey information must be recorded and evaluated as follows:

(a) staked plot Survey information recorded on the survival staked plots form (FS 707);

(b) staked line Survey information recorded on the survival staked lines form (FS 844); and

(c) a survival surveys summary form (FS 716) must be prepared for each Opening, summarizing information recorded on the field data forms and specifying Silviculture Treatment Recommendations.

5.8 A forest cover polygon submission into RESULTS is not required.

5.9 A Survey Map must be prepared for each Opening. Survey activity to be submitted into RESULTS.

ARTICLE 6: PRE-STAND TENDING SURVEYS

6.1 The standards contained in this Article apply to pre-stand tending surveys in addition to the standards specified in Article 3.

Stratification Criteria

6.2 All one (1) hectare or larger areas of an Opening which are significantly different from the surrounding area must be stratified into relatively homogeneous Strata based on:

(a) density and coverage of dominant tree species;

(b) existing or anticipated Silviculture Treatment Recommendations;

(c) forest inventory component;

(d) forest health factors;

(e) ecosystem site series; and

(f) forest stand structure.

Required Forms and Maps

6.3 Survey information must be recorded and evaluated as follows:

(a) Survey information recorded on the pre-stand tending survey form (FS 748);

(b) a pre-stand tending site description prescription form completed (FS 770) for each Stratum and recommended prescribed planned treatment(s) submitted into RESULTS; and

(c) a forest cover polygon submission be completed for each Opening.

6.4 The survey activity and the forest cover polygon submission for each opening must be submitted into RESULTS.:

(a) a Survey Map;

(b) a Treatment Map, where silviculture treatments are recommended;

ARTICLE 7: INSPECTION

Quality Inspection - General

7.1 The Inspector must inspect the Work in accordance with an Approved Surveys Quality Inspection System in a timely manner to ensure the results of the Work conform to the Ministry Standards, FIA standards or FFT Standards.

7.2 Unless otherwise Specified by a District Manager, the methodology given in this Article shall form the basis for the Approved Surveys Quality Inspection System.

7.3 The Inspector must carry out field and office inspections to an intensity necessary to confirm the items in section 7.10 and must make a written record of the inspection. The primary focus of an inspection is to verify that the silviculture and inventory labels, forest cover map changes, Silviculture Treatment Recommendations and Treatment Maps resulting from a Survey are correct.

Inspection Method

7.4 An Inspector must use one or more of the following inspection methods which form part of the Approved SQI System and must document the rationale for the choice of methods in the inspection report:

(a) an office review;

(b) a field reconnaissance;

(c) a field check on a portion of the Survey; or

(d) an independent Survey of selected Strata.

7.5 If an Inspector conducts an office review, the Inspector must review all forms, reports and maps to ensure they meet the requirements of the Ministry Standards, FIA standards or FFT Standards.

7.6 If an Inspector conducts a field reconnaissance, the Inspector must conduct a reconnaissance of a portion of each Opening and carry out an overview assessment of the quality of Work.

7.7 Where the Inspector checks the results of plots established by the Survey Crew, he or she must:

(a) inspect the lesser of all plots established or 10 plots in a Strata, selected on a systematic, unbiased basis and well-distributed throughout the Opening or Strata; and

(b) collect and record the same types of data and information as taken, or should have been taken, in the original Survey.

7.8 Where the Inspector conducts a field check of a staked line survey, the Inspector must field inspect the lesser of one line or 25 trees within an Opening, and must compare his or her assessment of the total number of surviving trees and of their condition with the Survey assessment for the same line or trees.

7.9 Where the Inspector conducts an independent survey, the Inspector must survey the selected Strata in accordance with the Ministry Standards, FIA standards or FFT standards.

Satisfactory Work Quality Defined

7.10 The Inspector must generally examine each Survey to the extent necessary to determine that the Survey has been undertaken and reported in accordance with Ministry Standards, FIA standards or FFT Standards, and specifically may determine a Survey to be satisfactory when, as appropriate to the Survey type and the chosen inspection method:

(a) an Opening is correctly stratified according to the Stratification Criteria;

(b) the Survey correctly identifies for a Stratum

i) the biogeoclimatic zone, sub-zone, and site series (ecosystem association),

ii) preferred or acceptable tree species as permitted under the Stocking Standards,

iii) the order of the leading and secondary species in the inventory label, and

iv) stocking status (e.g., SR vs. NSR);

(c) the Survey correctly reports

i) a brush hazard,

ii) any pest, pest damage, disease, disease damage or other physical damage;

(d) there are no errors in measurement that exceed allowable errors or, if errors in measurement are found, such errors are not material to the results of the Survey;

(e) in a Survival Survey, planted and natural trees are correctly distinguished;

(f) a field check finds a difference of no more than 10% between the Survey and the Inspector's tally in any one of the following total counts of

i) well-spaced trees by species,

ii) free-growing trees,

iii) plantable spots,

iv) preparable spots, and

v) in a survival survey, the live trees by condition category;

(g) there is a difference of no more than 20% between the Survey and the Inspector's assessment in the total trees from the results of actual plots established in a Stratum;

(h) an independent Survey within a Stratum shows that, at the 95% confidence level, the estimates of the number of well-spaced or free-growing trees are drawn from the same population; and

(i) field cards, reports, maps or summaries are legible, and are completed in accordance with the Ministry Standards, FIA standards or FFT Standards.

ARTICLE 8: REQUIRED REPORTS & RECORDS

General

8.1 The District Manager may at any time request the Recipient provide him or her with any information related to the Work, and the Recipient shall supply the information within a reasonable time period.

TFL's, CFA's

8.2 Where the Recipient holds a tree farm licence (TFL) or community forest agreement (CFA) and conducts Surveys on Crown land that is part of its TFL or CFA, the Recipient shall, as appropriate to the results, recommendations or Treatment Plans arising from the Surveys, update forest cover maps and silviculture and forest inventory information systems for the TFL or CFA.

TSA's

8.3 Unless otherwise specified by a District Manager, where the Recipient conducts Work on Crown land that is part of a timber supply area (TSA), the Recipient must, keep the original copies of all inspection reports, forms, maps, reports, photographs and other material and records which are required under this document to be prepared or completed for 3 years after the completion of the project.. The recipient must ensure that pertinent information is place into RESULTS as per the RESULTS INFORMATION SUBMISSION SPECIFICATIONS - Government Funded Silviculture Activities.

ARTICLE 9: SUBMISSION INTO RESULTS

General

9.1 The recipient must submit completed survey, prescribed planning activities, where applicable, and forest cover polygon & map into RESULTS using Electronic Submission Framework.

ARTICLE 10: ACTIVITY SPECIFIC SURVEY STANDARDS

10.1 In addition to this standard there are activity specific survey standards for surveys being conducted in wildfire areas and MPB damaged areas. These activity specific survey standards are found on the FFT website.