

Working Toward Better Answers

**A Workshop for
Timber Cruising Measurement in BC**

*March 6 and 7 2006
Richmond BC*

*Ministry of Forests and Range, Revenue Branch
Applied Science Technologists and Technicians of BC*

Applied Science
Technologists & Technicians
of British Columbia



Acknowledgments

The Applied Science Technologists and Technicians of BC would like to thank all of the contributors to the Timber Measurement Workshop. In particular, the Ministry of Forests and Range, Revenue Branch provided the financial support and recognized that a collaborative approach to discussion and change advances the interests of everyone involved in the cruising community.

Executive Summary

The Ministry of Forest and Range contracted Applied Science Technologists and Technicians of BC to convene a workshop and open the discussion for ideas that would lead to recommendations for meaningful change in cruise design and standards. This paper records the results of the first step in the process of consultation.

Select practitioners from the MOFR, Cruising Associations, Industry Associations, ASTTBC, ABCFP and Cruising Consultants participated in the workshop. Written submissions detailing potential changes or issues were first received from the primary organizations. A discussion agenda was drafted based on the submissions and further consultation.

The workshop participants defined the goal of timber cruising and detailed a set of objectives and strategies for timber cruising in BC. The goal of timber cruising is *to provide reasonable [sound] methods able to determine timber attributes [e.g. species, volume and quality] for various uses by government and industry.* The objectives were itemized in 7 categories as follows:

1. Design: To have a toolbox of unbiased sampling methods that are able to achieve an appropriate *Standard Error* for defined populations.
2. Compilation: To provide a system that will have flexibility for input and will compile to specified minimum standards, where the user defines those standards.
3. Check cruise: To check the cruise results against defined standards; to compute differences, record and report the results; to serve as a proactive communication process between the users and providers of technical data; to have a Quality Assurance process, which can, after the fact, check accuracy; to serve in a training/mentoring capacity.
4. Reporting: To report the results of a timber cruise based on the cruise design objective.
5. Planning and Administration: To set the framework for achieving cruise objectives including minimizing [sample] bias, encouraging efficiency, and to provide details of population definition, sampling method, sample size.
6. Cruise Manual: To provide an information source for cruising standards and procedures.
7. Training: To ensure that satisfactory training is available for timber cruisers.

Each objective contains strategies that define how the collective cruising community could complete the objectives. A reoccurring tenet of the workshop was the potential benefit of applying professional principles to timber cruising practice. A brief explanation of the application of professionalism is summarized.

The Timber Cruising Measurement workshop provided several recommendations. The recommendations are not intended to be binding in any form, neither are they intended to be complete. The workshop was successful at opening dialogue and producing initial discussion on cruising issues.

Recommendation 1. Establish a timber cruising technical committee.

Recommendation 2. Define "Check Cruising"; Move toward professional reliance model

Recommendation 3. Develop a dispute resolution process

Recommendation 4. Cruise plans utilize consistent style, are objective and the information is measurable.

Recommendation 5. Cruising Manual be separated into (a) Cruise -(Standards) Manual and (b) Cruise Procedures Manual.

Recommendation 6. Continued dialogue within the cruising community.

Recommendation 7. Cruising seminars by the CCSTF, SITCA, and NICC be continued as successful forums for the transfer of the technology.

Working Toward Better Answers
A Workshop for
Timber Cruising Measurement in BC

Forestry includes an understanding of biological components, management activities, products and services. In order to make intelligent decisions regarding the management of forests, information must be obtained and expressed in quantifiable terms. Timber measurement is a basic requirement in furthering our knowledge of trees, products, services and costs. The timber cruiser is relied upon to provide this information.

Timber cruising for the purpose of stumpage appraisal in BC has historically being linked to the timber pricing system. Cruising for industry and private landowners uses a much broader group of cruising methods and procedures. The Ministry of Forests and Range, Revenue Branch (MOFR) has recognized that a move towards a results-based approach, together with possible changes to the current cruise standards may improve the estimate of the volume and value of timber on a cutting authority area. The Applied Science Technologists and Technicians of BC (ASTTBC) also recognized the need for improvement and commissioned a review of the timber cruising process. Dr. Kim. Iles completed the discussion and recommendations in a report titled "*Improving BC Timber Cruising & Valuation*" June 2003. As a result of these endeavours, the MOFR contracted ASTTBC to convene a workshop and open the discussion for ideas that would lead to recommendations for meaningful change in Cruise design and standards. This paper records the results of the first step in the process of consultation.

A request to provide recommendations for change was forwarded to all timber cruisers through their various organizations in the province. The Cruising Associations and the Northern Region Districts of the MOFR provided written submissions containing suggestions for change. The submissions were used to outline the kinds of change that may benefit from a collaborative discussion on cruising issues. The submissions set the framework for defining a discussion agenda. Select practitioners from the MOFR, Cruising Associations, Industry Associations, ASTTBC, ABCFP and Cruising Consultants participated in the workshop and contributed to the recommendations paper. (See Appendix I for the list of participants)

The Workshop set out to discuss, clarify, and then agree on the goals and objectives of timber cruising in BC. *Goals* are qualitative descriptions of desired endpoints. The Timber Cruising Goal was drafted and documented in the paper. The goal would be met by achieving a defined set of objectives. *Objectives* are measurable defined targets that have the following components: identify a result; identify how the outcome will be measured and verified; identify who is responsible for the results. The workshop participants completed a set of timber cruising objectives to meet the overarching goal. The participants then described *strategies* aimed at defining how the collective cruising community intends to complete the objectives. Following each of the main headings in the paper are the summary discussions of the workshop provided by the participants. (The discussion comments are often presented in short sentence form). The goals, objectives and strategies of timber cruising contained in this report provide a starting point for effective change in the science of timber measurement.

“ **Cruising 1.** The systematic measurement of a forested area designed to estimate, to a specified degree of accuracy, the volume of timber it contains, by evaluating the number and species of trees, their sizes, and conditions. Cruise data can also include an assessment of habitat conditions, environmentally sensitive areas, and a tally of important features that have to be considered in an integrated resource management plan. **2.** A quantified sample that determines the quality and quantity of timber to be sold, as well as providing information regarding stand productivity for estimating stumpage value, and data for management, protection, and silvicultural decisions.” (*Dictionary of Natural Resource Management*. Dunster and Dunster . UBC Press 1996)

Goal of Timber Cruising

To provide reasonable [sound] methods able to determine timber attributes [e.g. species, volume and quality] for various uses by government and industry.

Summary of Group Discussion:

Recognizing that timber cruising is used for forest management, timber sales etc., the cruising workshop participants would like Cruising information to be reliable, accurate, independent, auditable, repeatable, efficient, adaptable, and results based.

Opinions were expressed regarding the existing management links with the stumpage appraisal. The question was left unanswered as to whether the appraisal use drives cruising or cruising has many uses, one of which is appraisal determination. It was recognized that cruising, while most important for timber pricing, is also used for planning, research, timber supply, etc. To maintain objectivity and integrity in data collection some participants stated that the timber cruise information should be used by, but independent of, pricing formulas.

Several comments were made about the adequacy of cruise information to provide the real answer or forecast product recovery. One such example included the Decay, Waste and Breakage system as an unreliable predictor of product that can be used by sawmills. Dr Iles pointed out that BC should have a system that can accommodate the necessary uses, and data collection should not be driven to provide unreasonable things. Timber cruise information can be reliable and transferable. For example, accountants have standard systems that can be used anywhere in the world. The processes are all worked out and finite enough that the answer can be tracked to the origin. When asked if it was important to get the right answer? Dr Iles responded, "It is important to be able to get the right answer."

The participant discussion led to the removal of "value" from the goal statement because there are many attributes of valuation that are independent of timber qualities. However, in discussions following the workshop, Dr Iles pointed out that even if the values for grades change, he believes the SE% will be virtually identical. Dr Iles further clarified that we can verify the change with some runs on current data.

The general indication from the participants was that timber cruising should have a toolbox of methods and procedures that may or may not be required for each use.

Timber Cruising Objectives

The goal of timber cruising can be achieved by delivering the appropriate attention to the following 7 objectives.

1. Design Objectives

Objective statement: To have a toolbox of unbiased sampling methods that are able to achieve an appropriate *Standard Error* for defined populations.

Summary of Group Discussion:

The vision of the timber cruising participants was to define the “Toolbox” of sampling methods. The sampling methods in the “toolbox” would be approved for use by an overarching body (MOFR?) and provided in sufficient detail that there would be confidence regarding the outcome. The Toolbox would need to have accuracy, cost effectiveness and precision to be approved for use.

Pricing use is a primary driver of the cruise. Therefore, correlate bid price of the timber cruise (right now bid prices are all over the map and are not related to the information or the anticipated winning price of a stand)

Dr Iles indicates that there is no real hope of describing the reason for a difference in bids. Describe sampling error at the 68% level (7.5% on either side 68% of the time, rather than 15%; either side 95% of the time) then cruisers should be able to choose a method to achieve the defined sampling error (for example 6 approved methods of measurement systems)

A suggestion was made that sampling error could also be determined for value and stumpage, and reported on by the compilation system (in addition to the Gross and Net Volume). Some participants commented that this is difficult without knowing the operating costs. Collectively participants seemed to agree that being comfortable with the answer means that we work with a reasonably familiar system. Comfort should also mean fairness and therefore we expect to get readings around the mean and not always on the low side of the mean. Ultimately there was agreement that spending money on actions leading to reassurance in the cruising system is a worthwhile expenditure.

Foresters like to collect information, make sure the information collected is useful. However, MOF also gets into to minimum plots/ha to influence SE. A private forest landowner desires to know What is the right answer? and How much will it cost? There is an expectation that the answer will be accurate because you are an expert.

Dr Iles contends that a toolbox approach is therefore preferred; even if you only use one system it is well advised to be able to undertake the various methods of measurement. Additionally, there is a need to get compilers ready for handling systems well before they are actually needed or implemented.

Design Strategies

- **Establish a Cruising technical committee(s)**
 - Purpose is to identify training needs, provide technical expertise
 - Divided into two subgroups of coast and interior
- **Non-partisan collaboration** (principled, non representational vs. positional)

Summary of Group Discussion: The issue of representing a specific vested interest gets to the heart of timber cruising data as an interface of the landowner tenant relationship, i.e. between government and tenure holders. Opinions were split between two fundamental frames of decision-making. The first states that if individuals can't represent a constituency then outcomes cannot be controlled. The second opinion states that we cannot define sound sampling by partisan or constituent representation. A technical committee is dependent upon technical expertise in cruising and not a partisan benefits. Agreement: The development of a technical committee is necessary, the shape of which is not yet determined.

- **Steering Committee**
 - Purpose is to provide direction to the Technical committee(s)
- **Training opportunities for specialists (government, industry)**
- **Financial resources** (*usually funded by government or industry in a support mechanism; we need to have some financial innovation*)

2. Compilation Objectives

Objective statement: To provide a system that will have flexibility for input and will compile to specified minimum standards, where the user defines those standards.

Summary of Group Discussion:

The vision of the “Timber Cruising Toolbox” approach is that it has to be flexible. All of the compilers must have standardized minimum outputs of end use with flexibility of inputs. The “user” should define the minimum standards of the output e.g. if the end use is for appraisal purposes, then the MOFR will define the output.

Compilation Strategies

- **Establish a technical committee** (not necessarily equal representation but staffed with competent individuals)
- **Inform compilers**
- **Provide financial support**
 - *($\$$) MOFR is not in the business of developing compilation software, but in establishing standards. Expensive projects such as converting 3P to appraisal standards will have to identify the positive cost/benefit of such expenditure. Time better spent on Big/Little BAF more cost effective than developing the point-3P combined method.*
 - *MOFR approves compilers based on standard. Therefore, there could be a need for technical and project support.*
- **New System based on administrative fairness**
- **Define the risk to the crown as a standard of compliance**
 - *The participants discussed the idea that it should not simply be risk to the crown but “risk” as a standard of compliance.*

3. Check Cruise Objectives

Objective statements:

1. To check the cruise results against defined standards
2. To compute differences, record and report the results
3. To serve as a proactive communication process between the users and providers of technical data
4. To have a Quality Assurance process, which can, after the fact, check accuracy.
5. To serve as training/mentoring process

Summary of Group Discussion:

The name of the objective “Check Cruise” could be changed to “Monitoring” or “Quality Control” or “Practice Review”. The level of standard may not be considered to be detailed enough to be an audit.

Specific features of the check cruise were discussed such as the problems created because strip lines and painted trees are used as an audit attribute. A suggestion was made to undertake a comparative analysis relative to using a new cruise data set. In other words, measure the null hypothesis that the two data sets are the same.

Dr Iles confirmed for the participants that it is cheaper to check the plots than to replicate the data sample, including new locations. He indicated that an accuracy of 15% between the actual data and new monitoring data would yield combined errors that may not be small enough except at a large scale like a region. While revisiting the same plots provides a reduction in the possible variation between data, visiting the same plots shouldn't mean that the colour of ribbon is an error in sampling. Quality control is intended to analyze the data and methods of timber cruisers. The participants agreed that whatever changes are contemplated that they use the “results-based” and professional reliance model in use through the FRPA.

It was pointed out that the check cruise is also an educational opportunity for timber cruisers. One such check cruiser system uses a group of plots rather than a single plot. The Monitoring officer revisits the cruisers plots and recollects the plot data in the field. The cruiser plots and the Monitor's plots are then compiled and the resultant differences are evaluated. The Monitor presents the resultant differences to the data user and the user decides whether the differences are significant enough to warrant action.

It was pointed out that Check- scalers keep a record of the scale compared to the audit result. Dr Iles recommended that we immediately begin recording the difference between check cruisers and the cruise data. If the differences are within 1% or 2% then the user may not want to correct for the difference. But at least the user should know. Similarly, if over the course of the year there is 2 % difference, then it doesn't matter who or which data set is right. It is important to define what a reasonable difference is between the data sets and at what point does it matter. Different values result in different sensitivities as the value changes, so a standard set of values should be used to compute a sampling error for value. There was a strong opinion that setting standards around measuring trees does not mean introducing the complexities and fluctuations of value. (Some disagreement on these points. Independent data influences)

Dr Iles indicated that even if the values for grades change, the SE% would be the same and this can be verified using current data and the \$BAR statistics in the JS Thrower program. Dr Iles believes that the variability of value and of stumpage price (not yet available) should be computed by compilers, and should be part of the check cruising system.

Check Cruising Strategies

- **Consider an independent function. Industry has an internal Quality Assessment process.**
- **Define “check Cruising” and the different functions for review. Identify when, for what purpose and to what level of tolerance a practice review would be completed.** (*Not only field data e.g. making sure the cards match the data being submitted. Mathematical error is covered in the appraisal manual.*)
 - *Comment - Thirty years ago the check cruising was directly involved with the cruise. Requires proactive cruise plans submitted and timely review.*
- **Ensure qualification for check cruising.**
 - ATC, ATE
 - Focus on the approved standards while working toward “what is the right answer” (vs. who is right)
- **Review Dispute Resolution Process**

Summary of Group Discussion:

A recommendation was forwarded to use an independent mediator when a dispute over cruise results arises. Currently the MOFR completes the Check Cruise, however, the MOFR is often one of the parties in the dispute. Any dispute resolution needs to be quick, efficient, and binding to both parties. Who pays?? Loser pays. A comment was made that an independent mediator without a perceived bias may be difficult to find.

In the scaling model you can call for an adjacent district scaler to provide an opinion. However, the timeliness and money increases substantially with timber cruises in dispute are much further distance than a log yard. The dispute would only apply in the case of a rejection of a cruise. Good incentive for the Crown to ensure that they hire people who are competent. There is no loss of money to either party in the dispute if one party accepts the complaint. The comments reflect on the timber cruising culture that has not recognized the consultation requirement between cooperative professionals in an alternate dispute resolution process (ADR).

Most professional organizations use an ADR process and a practice or peer review that can also be implemented by practicing cruisers. A few comments acknowledged that in practice and on most occasions, cooperation has been recognized and the check cruisers and original cruisers often resolve disputes in the field during the check.

- **Define the risk to the crown as a standard of compliance**

4. Reporting Objectives

Objective statement: To report the results of a timber cruise based on the cruise design objective.

Reporting Strategies

- **Report is based on the end use requirement.**

Summary of Group Discussion:

Simplicity, clarity would be themes of the report. (Some compilations are over a thousand pages in size because Cruise Manual can specify all of the different reports that are required in order to retain trees e.g. leave tree reports. Schedule B requires specific leave tree information relative to the base information. Site Plan says leave 15 trees and C&E goes out to look for 15. The cruise, developed for appraisal purposes, may not be a useful trigger for enforcement. However, using the appraisal timber cruise, as indicators of different attributes may be valuable in prescription development.

5. Planning/Administration Objectives (Cruise Plan)

Objective statement: To set the framework for achieving cruise objectives including minimizing [sample] bias, encouraging efficiency, and to provide details of population definition, sampling method, sample size.

Summary of Group Discussion:

The participants discussed the requirement for a cruise plan. Specifically the questions were asked, “Do we need the plan?” and “What are the merits of doing the plan?”

There was general agreement that a cruise plan is a required product of a cruisers work. However, differing opinions existed on whether the plan is submitted and approved in advance. At least some of the participants believed that the cruiser could be relied upon to do the job properly and ensure that the plan is complete, documented and on file.

The cruise plan was explained to be a workload planning tool for the check cruisers as well as an operational logistic tool for the cruiser. It is also used to assess the risk of one cruise method to be used rather than another method.

Additionally, the cruise plan allows the government to wave a SE based on the # of plots used. It obliges the cruiser to provide a final plan and while the process is less flexible, it does give greater comfort in data collection integrity to the government. Reasonable plan provided to an oversight ministry. More difficult to change after it has already being stated.

Cruise plans need to follow a consistent style and content; they need to be objective and the information must be measurable.

Planning Strategies

- **Prepare a comprehensive plan to meet cruise objectives.** The purpose of the plan is to ensure the task is completed and objectives are achieved.
- **Have the CP cruises available for review. Signed and accountable for work.**
- **Inform “planners” of toolbox approach.**
- **Timely process that supports business needs.** MOF can go to a schedule of check cruise.

Summary of Group Discussion:

The issue of Cruise Plan submissions and the process of cutting permits application is significant to cruisers and check cruisers. If there are to be “just-in-time” cutting permits, then there also needs to be a Cruise Plan available for review. The need to have immediate practice review of a timber cruiser product is a professional reliance issue. Currently the cruise plan is required for check cruisers to risk assess and schedule checks and the SCS cruise system requires the plan for this purpose.

6. Cruise Manual Objectives

Objective statement: To provide an information source for cruising standards and procedures.

Summary of Group Discussion:

The Cruise Manual is currently a prescriptive document that lays out the procedure very explicitly. It was suggested that the Cruise Manual address the policy needs of the Ministry by using standards. The procedures could then be identified in a different document. E.g. SE needs to be less than 15% at the 95% level for total volume of combined species.

Cruising Manual Strategies

- **Separate the two components of the cruising manual into (a) a Cruise Policy Manual to reflect Branch policy by setting cruise standards and (b) Cruise Procedures Book to identify appropriate sampling procedures.**
- **Identify the procedures that apply to standards**
- **Codify the attributes to be measured and suggest acceptable methodologies (What to measure, what tools to measure with)**

7. Training Objectives

Objective statement: To ensure that satisfactory training is available for timber cruisers.

Summary of Group Discussion:

If the cruising community is to use principles then cruisers need to understand the theory behind the data collection in order to apply the principles consistently.

How the information is acquired and confirmed relies upon individual diligence and education as a part of competence. How does the FMRB fit into the accountability link? MOFR is providing education for their staff in Call Grading Net Factoring.

Training Strategies

- **Utilize a training base that provides principles instead of rules**
- **Mandatory certification**
- **Mandatory continuing education**

Professionalism

On several occasions throughout the workshop the Principles of Professionalism were identified as important corner stones for successful change toward a results based approach in timber cruising. When professional principles are applied consistently by forest resource professionals, and understood by employers, clients and government, then the guarantee of professional accountability and the reliance on professional judgement becomes a powerful social instrument in the management of forests and forest business.

Professional reliance is to rely upon the judgment of a professional. The confidence and reliance exists as a quality assurance mechanism because professional judgement is applied independently, by competent practioners who act with integrity and are accountable for their professional work. In practice, one professional member does not need to check the work of another professional in earnest because they can trust that each has applied professional principles within every aspect of the work. The trust is not a blind trust however, and periodic monitoring for competence, practice reviews etc. form part of a valuable system of continuing improvement. The employer and the government both have a role of ensuring that a suitable practice environment exists for the application of professional principles.

The timber cruiser holds the position of collecting measurements for an employer that are to be used for specific purposes by the employer and by others. The content of the data needs to be complete and correct in order to rely on the information. The data is strongly science based, but requires some judgement in how the various rules may apply and needs to be framed within the context of its intended use. Several years ago, the timber cruising community in BC, guided by the ASTTBC, accepted the principles of professionalism and applied these principles to the science of timber measurement and compilation. The result is a history of accredited timber cruisers who understand and practice professional principles.

List of Workshop Recommendations

The following recommendations were generated from the Timber Cruising Measurement Design workshop. Participating in the workshop were appraisal and cruising practitioners from the MOFR, Industry Representatives and Consultants. The recommendations are not intended to be binding in any form, neither are they intended to be complete. The workshop, report and recommendations have been initiated and funded by the MOFR and are intended to increase dialogue on cruising issues. The workshop was successful at opening dialogue and producing initial discussion.

Recommendation 1. Cruising Technical Committee

Establish a timber cruising technical committee to identify training needs and provide technical expertise in cruising methods, practice reviews and compilation. The shape of the committee is not yet determined however, consideration should be given to a Steering Committee with Coast and Interior subcommittees.

Recommendation 2. Check Cruising

Define "Check Cruising" and the different functions for review. Identify when, for what purpose and to what level of tolerance a practice review would be completed. Move check cruising toward the professional reliance model, with the realization that in the revenue context, to protect the financial interests of the crown is a priority.

Recommendation 3. Dispute Resolution

Develop a dispute resolution process (e.g. independent checker) when disagreement over results occurs. The MOFR will retain control over the overarching mediation direction.

Recommendation 4. Cruise Plans

Cruise plans should follow a consistent style, be objective and information measurable. Cruise Plan content and use would benefit from further discussion (notably: the need for approval as compared to being submitted and retained on file).

Recommendation 5. Cruising Manual

Separate the two components of the cruising manual into (a) Cruise -(Standards) Manual to reflect Branch cruise standards and (b) Cruise Procedures Manual to identify appropriate sampling procedures, cruise design and quality assessment.

Recommendation 6. Continued Dialogue

The Timber Cruising Measurement workshop provided a valuable forum for a discussion of cruising issues. It is recommended that a similar form of dialogue be continued in the potential steering committees as change unfolds. *(See Recommendation 1)*

Recommendation 7. Technology Transfer

Changes and modifications to cruising procedure, practice review and use are required to be communicated to timber cruisers throughout the province. It is recommended that the Cruising seminars organized by the CCSTF, SITCA, and NICC be continued as successful forums for the transfer of the technology.

Additional Technical Discussions

Several technical issues were raised in the written submissions and the workshop discussion. The workshop participants determined whether the technical issues met the timber cruising goal and objectives defined earlier in the workshop. A term for action (*Short, Intermediate, Long*) and who could be assigned to the task was anticipated. Identifying actions within the business areas begins to form a blueprint for change in Timber Cruising Measurement in BC.

<i>Business Areas Issues</i>	<i>Fit With Goals and Objectives</i>	<i>S=Short I=Intermediate L=Long</i>	<i>Assign To</i>	<i>Comments</i>
Design				
<i>Large area; small area</i>	Yes		ctc	
<i>Discretionary sampling methods</i>	Yes		ctc	
<i>Blanket cruising</i>	Yes		ctc	
<i>Sample size</i>	Yes		ctc	³ Dual standards SE 10% and plot per ha
<i>Min. typing & type size</i>	Yes	<i>Short</i>	ctc	²
<i>Big/Little BAF//100%</i>	Yes	<i>Short</i>	ctc	¹
<i>3P</i>	Yes	<i>Intermediate</i>	ctc	
<i>Minimum tree counts</i>	Yes		ctc	⁵ SE waved but still need min tree count to meet the manual (onerous because need to resweep with a different BAF)
<i>Maturity class DP</i>	Yes		ctc	
<i>POC</i>	Yes		ctc	
<i>Comparative cruises</i>		<i>NIS</i>		⁴ Splitting blks to achieve stumpage efficiency
<i>Net Down Grades</i>	Yes	<i>Short</i>	MOF	⁶ NFCG
<i>SE/Risk</i>		<i>NIS</i>		
<i>Localized adjustments</i>	Yes	<i>Long</i>	ctc	⁷
Compilation				
<i>Blk method vs. avg Line</i>	Yes		ctc	
<i>Cruise card header</i>	Yes	<i>Intermediate</i>	MOF	
<i>Taper measurements</i>	Yes	<i>Long</i>		
Planning				
<i>Cruise plans and types</i>	Yes		ctc	
<i>Cruise Plan Map ex</i>	Yes		ctc	
<i>Interior Cruise Manual sec 2.1.2</i>	Yes	<i>Short</i>	MOF	
<i>Comparative Cruises</i>				
<i>Administrative Barriers</i>	Yes			⁸ No cruise plan approvals result in no cruise plan completion prior to work; Cruise Plans submitted with greater than 30 days; when to check cruise

Timing - *Short*: Solutions to be discussed.

- *Intermediate*: Process started and implementation may take some time

- *Long*: No action planned in the future.

NIS = No immediate solution

ctc = cruising technical committee

MOFR = Ministry of Forests and Range Revenue Branch

Comments referenced in the table above:

1 Big, Little BAF and 100%. MOFR has a concern around the risk of poor sampling. How many volume trees? Is this something that the technical committee will solve? The benefits risks and methods need to be developed by the technical group. Compilers need to provide the technical committee COV on several attributes and check where this will work on a regular basis. Change from height measure of "100 trees per blk" rule. This rule doesn't make sampling sense.

2 Minimum typing and type size. A discussion centred on stratification before the fact or not at all.

Typing relies on you seeing the edge of the stratum. If you can't see it then it won't work. A different view suggested that the cruiser "pre-type and adjust the boundaries if you see a difference on the ground". However, MOF sense was that post-stratification meant the FS loses. Dr Iles commented if post stratification lowers the stumpage price, then the MOF should receive the higher price because the main benefit of post stratification should be data gathering efficiency. The question was then asked, "Why limit us to the overview typing, and not use the best information available?" KI responded, "Because it causes a bias to do it and the gain is not worth the grief due to the lack of trust that is created". MOF typing is used as a way to vary results (or at least the perception of cheating). Clients or the users of cruising service spend money for guarantees and a defensible procedure is one of the guarantees. The general opinion of the workshop said that there is not enough to be gained by typing if you can't see it.

3 Sample size. If the value of the timber is very low, then how much money should both parties have to spend on gathering timber measurement information? However, if price goes up then we may require additional information. There are other reasons why dual standards may be desirable. A more sound answer is always desirable however, the metric to lower standards should not be just value, because it is too easy to manipulate. Perhaps the more sound answer and sampling error are adjusted as a species dependence factor.

4 Comparative Cruises. There was a discussion regarding the potential for splitting blocks to achieve stumpage efficiency. Shaping data to lower stumpage is only fine if both parties are aware of the effect and both agree that the action is done for business reasons. Technically it is not sound sampling. However, the sound sampling is frequently not the reason for action. Temper the discussion and be guided by impact. For example, if splitting caused an effect of change to be 1% you wouldn't spend 10% of your resources trying to catch the inconsistency. The manner of effect is often used to drive action for business reasons. For example, you may want to mix and allow cutblock blending in order to drive the use of small diameter wood. We do something that is technically wrong because it is a business decision. Not technically defensible but is a business agreement for a business purpose.

5 Minimum tree counts. An example is small brood removals. If you don't meet sampling error then need a minimum tree count. Conversely, if you do meet SE then don't worry about tree count.

6 Net Factor Call Grading. A suitable change instead of developing complicated algorithms. Currently agreed by interior group. Generally, cruisers are being underutilized in terms of their capabilities; the NFCG gains efficiencies by using the timber cruiser expertise. COFI indicated that this was fine as long as it is married with the stumpage derivation. Need a suitable waste estimate.

7 Localized adjustments. NVAF is in government control, whereas most of the information above gives licensee opportunity for change e.g. localized DWB factors, taper equations. MOF yes ok but quite expensive to develop.

8 Administrative Barriers. The MOFR can check cruise all of the way up to the day of appraisal, which leads to anxiety around up to the last day. Cruise bounced on the day of appraisal submission is a substantial cost. Frequency of occurrence?

APPENDIX 1

Workshop Participants

Norm Shaw, RFT, ATE *Workshop Facilitator* (BCIT)
Dr. Kim Iles, PhD, ATE *Workshop Mensuration Specialist* (Kim Iles & Associates Ltd.)
Mike Larock, RPF *Project Manager and Author*, (Huock Resource Consultants Ltd.)
Cindy Aitken, *Workshop Planner* (ASTTBC)
Keith Tudor, RPF, ATE *Workshop MOFR Contact* (MOFR)
Ron Mecredy, RFT, ATE *CCSTF Rep.* (Mecredy Cruising and Forest Consulting Ltd.)
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