

Issue ID#	P1
Contact Info	Keith Tudor and Tim Salkeld: MSRM - Resource Information Br.
Issue Description	VEGCAPS: Data edit errors have been identified on the following fields: i) Null versus blank field ii) Rank/layer iii) History iv) Reference Year
Technical Lead	Tim Salkeld
Priority Assessment	High
Reference Information	Photo data entry software / data validation
Background	i) Errors occur when custom data entry tools developed by contractors incorrectly assigns the value (tab=null / the correct value; space=blank/incorrect value). When the data is processed through VEGCAPS by the contractors this error is not identified. This issue may cause errors in processing or client analysis. ii) Information appears to be missing on some VIF files. iii) Information does not appear to be coded consistently. iv) Currently there are three data sources used to determine a year to begin projecting tree growth (reference year). The reference year is determined from the year of photography, the update height date and the update age date. The proposal is to reduce this to one date (reference year) modeled to the polygon and translate the update years (age and height) to this new field during conversion. Date of photo needs to be retained as it is metadata.
Benefit of Change	Data entry / validation software that generates fewer errors.
Resources Required	Staff / contract time
RIB Recommendation	VEGCAPS will be retired and replaced with new data entry tool. No further upgrades will be made to VEGCAPS. i) Null versus blank field: a data conversion issue only. Occurs when attributes are run in SAS ii) Rank/layer: already resolved. No action necessary. iii) History: a data validation issue not a Change Management issue. iv) Reference Year: a data modelling issue only. Not a Change Management issue. Tim Salkeld to clarify who maintains the VEGCAPS validation routines.
Client Comment	This issue is of a general nature and was not sent for client review.
Final Resolution	VEGCAPs is no longer being supported as it being replaced by RESULTS, therefore no further updates will be implemented.
Action	No Action

Issue ID#	P2
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Contact Info	Joe Kavanagh – Canfor (Prince George) jkavanagh@mail.canfor.ca Phone: (250) 962-3337
Issue Description	Ground Call criteria does not account for different forest types throughout the province.
Technical Lead	Matt Makar
Priority Assessment	Medium
Reference Information	Field procedures; QA standards and project planning
Background	<p>In the northern interior a contractor could pass the ground check by identifying that PI 100% is there, with very little other information correct to pass. Ages and or heights could be wrong on over 25% of the area and they would pass.</p> <p>On the coast and southern interior, there is a multitude of species, sometimes all in the same stand, and in these areas species composition and secondary species are extremely important. Next in order of importance would be accurate heights and ages. The current ground call QA forms reflect this.</p> <p>In the northern interior, where the fire origin stands have usually only one or two species, and generally the second species is a minor or very obviously secondary species, the most critical aspects for ground detection work is not species composition, but heights and ages.</p> <p>The quality control forms need to reflect the priorities of the type of inventory being completed. If the inventory is in a fire origin area, with single leading species and or obvious secondary species, the forms need to reflect that height and age are most important. If it is a multi-species inventory then species should be prioritized as most important.</p> <p><i>Issue clarification:</i> Discussion between Joe and Matt revealed that this issue is primarily about correct assignment of site index. Crews doing ground calls were making errors on many (estimated at ~25%) of the heights and then making a similar level of error on ages for different trees where heights were correct. This resulted in site productivity being wrong for <u>50% of the ground calls</u>.</p> <p>In terms of meeting the required accuracy standard, Matt pointed out the following to Joe:</p> <p><i>For Ground calls, a crew could have age OR height wrong and still pass the polygon. (25 points out of 30 - 83%), but could not have both wrong (120 points out of 30 - 67% where the standard is 75%). They also have to have 75% on each category (age, height, species) as well when summarizing a number of ground calls, so if they were wrong on every age, but had everything else perfect they will still not pass because they did not make 75% for the ages on all the calls. (it's in the fine print at the bottom of the page). The air calls have a similar way of ranking except it's 70% to reflect that they are estimates rather than measurements. Ages and heights are worth 19 points out of the 30, and they also have to meet 70% for each category as well.</i></p>

Benefit of Change	Increased reliability of the inventory
Resources Required	Staff time to make changes to necessary documents.
RIB Recommendation	<p>Need to involve contractors in this issue. This is primarily a contract management issue, but will impact field procedures and QA standards.</p> <p>Based on a discussion between Joe Kavanagh and Matt Makar, it is proposed that the required score on ground calls for each of the attributes should be raised from 75% to 85%. For air calls, the required score should be changed from 70% to 75%.</p>
Client Comment	<p>Jon Aleman: Trillium Pacific: I agree with the statement that this is primarily a contractual issue. The standards and procedures will never be comprehensive enough to cover every possible scenario or management strategy. Further, the ground calibration procedures are for just that: calibration; the determining factor of a quality inventory is the relative accuracy and consistency of the final photo interpreted attributes and associated spatial linework. I would expect that a project with a unique set of challenges should have the field work component structured to address those issues (eg, emphasis on air calls in complicated species areas, substitute age/height observations for formal ground calls in other special types, etc.). Regarding the increase of the required score for air calls, it is important to remember that it is still an estimate vs. an estimate. Perhaps a better route would be to ground check air call ages and heights (and then determine what required score would be appropriate; i.e., what is reasonable achievable).</p> <p>Frank Scheithauer: The proponent claims that the proposed change will increase the reliability of the inventory.</p> <p><u>Client Comments:</u></p> <ol style="list-style-type: none"> 1) Quality Assurance standards and procedures for field collected data are highly subjective. As far as I know, there is no statistical or logical reason to believe that arbitrarily changing the rating standards will increase the accuracy of the field collected information and, in turn, increase the accuracy of the final inventory product. <p>Question for the proponents- Do the current field data collection Rating procedures and standards result in a final inventory product that meets Ministry inventory standards? If so, there is no need to change the Rating standards. If not, then we should be reviewing ALL inventory standards and procedures (including field data collection, polygon delineation, photo interpretation, Quality Control, Quality Assurance), identifying the shortcomings and providing statistically defensible solutions.</p>
Final Resolution	Changes to the accuracy standards are recommended.

Action	The changes have largely been completed to the standards. MM to review final document changes with team.
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Issue ID#	P3
Contact Info	Barry Elliott – Elliott Forestry, Burns Lake barry@elliottforestry.com Phone: (250) 695-6752
Issue Description	Problem with the definition of “Sparse” (SP) in level V of the Land Cover Classification.
Technical Lead	Laurence Bowdige
Priority Assessment	Medium
Reference Information	Photo interpretation, database, data entry and validation
Background	In the manual (p.149 the definition of “Sparse” is “Treed cover 10-25%, and shrub and herb cover = 26%.” For an area with herb cover of only about 15% (no trees, no shrubs), the LCC up to level IV would be VNUHE. This example does not fit into any of the Level V codes for Vegetated. To call it “Sparse”, is not permitted because there is 0% treed cover and this does not fit the definition (must be 10-25%), nor does it fit into the other codes. The definition for “Sparse” in the Phase II Appendices (p. 268), and Phase I Procedures (p.15), is different, stating “cover is between 10 and 25% for the treed polygon or cover is between 20% and 25% for shrub or herb polygons.” Again, using this example, there is no code in Level V that fits. Any plot that has = 20% cover of herbs or shrubs doesn’t have a classification.
Benefit of Change	Consistency between photo-interpretation, land cover classification and ground sampling standards.
Resources Required	Staff time
RIB Recommendation	This issue was recognized some time ago and is a small issue which would require major changes. Definition of “Sparse” should be “cover is between 10 and 25% for the treed polygon, or cover is between 5% and 25% for shrub or herb polygons.” We recommend that the documents should be made consistent.

Client Comment	<p>DM: However, it is a significant error that should be fixed. I don't understand why it is a major change. Herb or grass dominated vegetation with no trees and sparse cover should be able to be coded as indicated in the example above. It should be possible to have <10% cover of trees in a polygon and be able to classify a polygon correctly as sparse at Level 5. Changing the definition seems relatively straightforward.</p> <p>DC: I agree with the recommendation, [either substitute the word "or" for "and" or break it into two sentences] but perhaps it doesn't go far enough. The Original definition for all Density Classes in Phase 1 should be reworded for clarity. The order in which one considers the criteria for LCC is critical for consistent results. By the time you get to this point, you have already decided if the LCC is treed or not. If it is not treed, you consider if it is shrub. Only if it is not shrub do you consider if it is herb. If it is vegetated, not treed, shrub or herb, then it is Bryoid.</p> <p>Consider the case of a VTU with 15% tree cover and 65% pinegrass cover. Is this a densely-vegetated treed polygon, or a sparsely-treed polygon. I.e., does the density class describe the tallest vegetation class, the class that is dominant in terms of area, or all vegetation in total.</p> <p>Are there algorithms in the compilation routines that calculate LCC given other attributes of the polygon?</p>
Final Resolution	Implement RIB recommendation / manuals will be updated as desktop publishing resources will allow. Changes to be posted on web list server. (The list server will be available May 04)
Action	LB: Action deferred.

Issue ID#	P4
Contact Info	Guillaume Therien: J.S. Thrower & Associates giom@jstrower.com Phone (604) 739-9887 (Vancouver office)
Issue Description	<i>Volume should be photo-interpreted. It would give a much better basis to adjust the inventory. The arguments put forward so far against photo-interpretation of volume shows a misunderstanding of how the adjustment is done and used. It is still possible to adjust height, age, and photo-interpreted volume and make everything consistent for timber supply analysis</i>
Technical Lead	Sam Otukol / Laurence Bowdige
Priority Assessment	Medium
Reference Information	Photo interpretation, data entry and validation

Background	<p>Photo interpreted volume could be included as a non-standard attribute, however, the decision in 1996 was to remove this as a photo-interpreted attribute. This attribute is not currently modelled within the Oracle database.</p> <p>A review of this issue conducted by Sam Otukol using the Boston Bar pilot study results concluded that photo-estimation of volume was a less accurate and efficient way than using the VDYP yield model to generate estimated volumes. This analysis was the basis for the decision to drop photo-estimation. This decision could be reviewed if further data was brought forward.</p>
Benefit of Change	Na
Resources Required	Na
RIB Recommendation	The recommendation at this point is that this proposal be rejected.
Client Comment	Albert Nussbaum: Forest Analysis Branch will defer decision on this issue to MSRM. The MoF relies on the expertise of MSRM to provide reliable volume estimates.
Final Resolution	Defer final resolution. RIB to evaluate the other direct volume photo-interpreted project (Lignum).
Action	RIB Statistical Support Team to evaluate and provide final recommendation.

Issue ID#	P5
Contact Info	Guillaume Therien: J.S. Thrower & Associates giom@jstthrower.com Phone (604) 739-9887 (Vancouver office)
Issue Description	The definitions for Update_Age_Date and Update_Height_Date are not clear in the Data Dictionary (Linked to # P1).
Technical Lead	Tim Salkeld
Priority Assessment	High
Reference Information	The Data Dictionary definitions should include an example(s)
Background	Action on P1 could remove the need to deal separately with this item.
Benefit of Change	Na
Resources Required	Na
RIB Recommendation	Provide a clearer definition in the Data Dictionary.
Client Comment	This issue is of a general nature and was not sent for client review
Final Resolution	This issue will be addressed in the release of RESULTS.
Action	TS to address this issue.

Issue ID#	P6
Contact Info	Guillaume Therien: J.S. Thrower & Associates giom@jstthrower.com Phone (604) 739-9887 (Vancouver office)
Issue Description	Reinstate the confidence index for height, age, and basal area.

Technical Lead	Derek Challenger
Priority Assessment	Medium
Reference Information	Photo interp,; data entry and validation
Background	Having a confidence index for these attributes would be beneficial when adjusting the inventory.
Benefit of Change	Improved attribute reliability
Resources Required	Reinstate the confidence index for height, age, and basal area and train the photo-interpreters in correctly assigning a confidence index
RIB Recommendation	Confidence index is still an optional field. Proponents can have their contractors collect confidence index as it is still an optional attribute. This is a contract mgmt issue, not Change Management.
Client Comment	This issue is of a general nature and was not sent for client review
Final Resolution	Proponents can implement confidence index.
Action	No action

Issue ID#	P7
Contact Info	Roman Bilek: Triathlon (Forest Dimensions) rbilek@triathloninc.com phone: (250) 652 - 7077
Issue Description	Vertical Complexity in Non-treed Polygons (polygons with crown closure less than 10%)
Technical Lead	Derek Challenger
Priority Assessment	Medium
Reference Information	Photo interpretation; data entry and validation
Background	Vertical complexity has been used as an important criterion for assessing wildlife habitat suitability (e.g. marbled murrelet nesting site locations). In some areas, there was found to be poor correlation between the vertical complexity in the VRI data and that determined from reinterpretation of the photos and/or field checking of the stands. There is also concern about maintaining consistency of interpretation among interpreters. Maintaining consistency of this attribute in Vegetated Treed polygons is difficult enough, and, given the current guidelines, trying to estimate vertical complexity in polygons with tree cover under 10% (non-VT) doesn't seem to make sense. Vertical complexity should not be required for polygons with crown closure less than 10% or, at least, it should be made optional.
Benefit of Change	Unsure at this time.
Resources Required	Staff time

RIB Recommendation	Researching this issue brought up the likelihood that vertical complexity may have been entered as a mid-point value rather than photo-interpreted. Thus, consistency among interpreters may not be a significant issue if the procedures are properly followed, i.e. will be within one complexity class. Proponent's concern is only with stands outside the VT land base. The underlying concern here is the general lack of importance accorded to this attribute. Some checking of VRI data collected so far should be done to find out how widespread the problem is. Some additional training may be required. For non-VT polygons, a default value could be allowed.
Client Comment	DM: Recommendation seems reasonable. It appears that more information is required and the issue may be a 'training' one for forested polygons. DC: Concur Jon Aleman: Trillium Pacific: Not really an issue to me. If the usefulness of vertical complexity is felt to be unreliable at low levels of crown closure, then do not report on it (or publish the data with a disclaimer). Allowing for omissions of any particular attributes under any particular condition(s) introduces a further complication into the existing process. As an interpreter, I think I can provide useful vertical complexity values at any crown closure Frank Scheithauer: Agree with RIB recommendations
Final Resolution	LB: This is a training issue.
Action	No action

Issue ID#	P8
Contact Info	Mike Sandvoss: Timberline (Prince George) mks@timberline.ca phone: (250) 562-2628
Issue Description	i) Fix the cover pattern visual representations and associated descriptions pages in the Procedures Manual ii) Snags per hectare estimation from photos
Technical Lead	Laurence Bowdige
Priority Assessment	Medium
Reference Information	i) Photo Interpretation Procedures Manual i) Photo interpretation; field procedures; data entry and validation
Background	i) In the initial VRI standards document several of the descriptions were incorrectly associated with the visual representations. Two or three years ago they were fixed and then subsequently shown incorrectly again. They remain so in the most current version. ii) Snags cannot always be seen on the photos so it is questionable whether they should be photo estimated. They can only be accurately assessed in the field (ground). Also, the definition of what constitutes a "snag" needs to be clarified.

Benefit of Change	Updating standards manuals will reduce confusion. Revised standards for the assessment of snags will improve the reliability of the inventory.
Resources Required	Staff time
RIB Recommendation	i) Edit Manual to show correct visual representations of cover patterns ii) Convert snags/hectare into an attribute required only for polygons where it has been assessed in the field from a plot tally/prism sweep. Clarify definition of a “snag” in the Manual
Client Comment	This issue is of a general nature and was not sent for client review
Final Resolution	There are 2 items to address: i) If resources are available to update RIC documents, manuals will be updated to reflect correct cover patterns, ii) Defer: revisions to the database to incorporate snags will be completed as resources allow.
Action	LB: Action deferred

Issue ID#	P9
Contact Info	Joe Kavanagh – Canfor (Prince George) jkavanagh@mail.canfor.ca Phone: (250) 962-3337
Issue Description	Capture of up-to-date attributes in Backlog NSR silviculture openings
Technical Lead	Derek Challenger
Priority Assessment	Medium
Reference Information	Silviculture planning / Results?
Background	<p>There is a perception of a considerable amount of backlog silviculture stands on the land base due to no silviculture surveys being conducted on these areas for up to 20 years or more. The last silviculture survey may have shown deciduous cover, but treatment data for the stands may have been lost, or the stand is now coniferous without any treatments being carried out. The inventory photos capture this better information and classifiers could easily update the polygons, especially those which are 20-40 years old. This would eliminate areas thought to be backlog NSR area, but which are in fact restocked. This new data could also be used to identify polygons which require some silviculture action, without having to fund extensive field reconnaissance, or detailed surveys.</p> <p>Classifiers should use VRI photos to capture information in older silviculture openings and use existing silviculture data sources as reference material and redraw stratum and update only those applicable attributes to be consistent with the rest of the inventory.</p>
Benefit of Change	Na
Resources Required	Na
RIB Recommendation	This is a contract management issue, not a Change Management issue. Highlights the lack of coordination between the interpretation work being done in VRI Phase I and that of the Update group.

Client Comment	<p>Paul Rehsler:FPB has routinely published reports on the amount of Backlog NSR in BC. The information source for these reports was ISIS and will in the future be RESULTS. If the classifiers use VRI photos to capture information in older silviculture openings and reclassify NSR to SR, update species composition etc., this information should be used to update the status and information about these openings in the RESULTS database too. This is a reversal of the normal flow of vegetation cover information (i.e. RESULTS to VRI versus VRI to RESULTS). The goal being that the VRI and RESULTS databases will be the same.</p> <p>FPB contact for Backlog Reforestation is John.McClarnon@gems1.gov.bc.ca</p>
Final Resolution	Implement RIB recommendation
Action	No action required

Issue ID#	P10
Contact Info	<p>Joe Kavanagh – Canfor (Prince George) jkavanagh@mail.canfor.ca Phone: (250) 962-3337</p>
Issue Description	Scanning standards for VRI
Technical Lead	Jim Grace
Priority Assessment	Medium
Reference Information	Photo scanning standards
Background	<p>This past spring there was an obvious disconnect between existing scanning standards, with the primary purpose for TRIM, and scanning to get a better product in VRI. Scanning to give a better resolution/crisper image will enable better attribute estimation, which will in turn lead to better PEMs which in turn will lead to better habitat models, which in turn will lead to better sustainable forest management processes and so on.</p>
Benefit of Change	NA
Resources Required	NA
RIB Recommendation	<p>Jim Grace involved in this issue via involvement with BMGS and SOP. Scanning standards are a BMGS responsibility, not RIB. Any proposed changes should be directed to BMGS. This is not a VRI Change Management issue.</p>
Client Comment	This issue is of a general nature and was not sent for client review.
Final Resolution	Deferred at this time.
Action	This issue should be addressed by the VRI Steering Committee and addressed within the larger issue of minimum photo scale.

Issue ID#	P11
Contact Info	<p>Frank Scheithauer: ARC Alpine Resource Consultants Ltd frank@arcalpine.ca phone: (250) 475-7374</p>

Issue Description	Digital Image Quality and Digital Image Scanning Standards for Phase 1 VRI
Technical Lead	Jim Grace
Priority Assessment	Medium
Reference Information	Digital scanning standards / BMGS
Background	<p>There are a number of factors affecting the apparent viewing quality (“crispness”) of digital images for Phase 1 VRI purposes. In decreasing order of importance, these are:</p> <p>1) <i>The quality of the original photographic images</i> The quality of the original photographic images is the primary determinant in the viewing quality of a digital image. The bottom line- poor quality photographic will always produce poor quality digital images for Phase 1 VRI photo interpretative purposes (regardless of the other factors).</p> <p>2) <i>The original scale of the images</i> All things being equal, the apparent quality of a digital image scanned from a large scale photograph will always appear to be better than from a small scale photograph.</p> <p>3) <i>The quality and resolution of the workstation monitor</i> The DiAP softcopy system will function on any monitor capable of a minimum 120 Hz refresh rate. However, all things being equal, the apparent quality of a digital image viewed on a good quality monitor set at a high resolution will always appear better than an image viewed on a poor quality monitor set at a low resolution setting.</p> <p>4) <i>The scale at which the images are viewed</i> All things being equal, the apparent quality of a digital image viewed at a smaller scale (e.g. 1:7000) will always appear to be better than the quality of an image viewed at a larger scale (e.g. 1:500).</p> <p>5) <i>The digital image scanning standards.</i> The current provincial TRIM digital scanning standards are 10 to 15 microns for black and white imagery and 10 to 14 microns for colour imagery. Photographic images scanned at finer resolutions will generally produce better quality digital images than those scanned at coarser resolutions. All things being equal, it becomes increasingly more difficult to see differences in image quality as the scan resolution increases once you are down in the range of 15 microns or better. A photo interpreter viewing digital images on a high resolution monitor at a normal interpretation scale of 1:7000 cannot tell the difference between an image scanned at 10 microns and the same image scanned at 15 microns. The final bottom line- the existing current provincial TRIM digital scanning rate standards are adequate for Phase 1 VRI purposes. Efforts to improve digital image quality should first concentrate on factors other than scanning standards.</p>
Benefit of Change	NA

Resources Required	NA
RIB Recommendation	This item is a commentary on item P10 and identifies the underlying factors which control the quality and usability of digital photo imagery. Scanning standards are excluded as an important factor. As with P10 , this is not a VRI CM issue
Client Comment	This issue is of a general nature and was not sent for client review.
Final Resolution	Deferred at this time.
Action	This issue should be addressed by the VRI Steering Committee and addressed within the larger issue of minimum photo-scale.

Issue ID#	P12
Contact Info	Frank Scheithauer: ARC Alpine Resource Consultants Ltd frank@arcalpine.ca phone: (250) 475-7374
Issue Description	Ground Calibration Point Data Collection Procedures and Standards (Version 2.0 - March 31, 2003)
Technical Lead	Matt Makar
Priority Assessment	High
Reference Information	Field procedures
Background	<p>In the recently released updated procedures for the establishment of VRI Ground Calls (Ground Calibration Points) the following changes were made:</p> <ul style="list-style-type: none"> i) The minimum number of plots has been increased from one to three plots; ii) The minimum number of sample trees (for the leading species) has been increased from one to two trees; iii) Diameter limits for tallied trees have been introduced and the minimum diameter limit has been set at 4.0 cm DBH; iv) The minimum fixed radius plot size is now 3.99 meters (plot sizes of 1.78 meters, 2.52 meters, 3.09 meters and 3.43 meters are no longer allowed); v) The minimum distance between plots has been increased from 30 to 50 metres. <p>The purpose of establishing Ground Calibration Points is to “provide calibration information for subsequent photo interpretation by the individuals conducting the field visitations”. If the primary rationale behind these changes to procedures is to increase the accuracy of the collected information, we are not convinced that these changes will have the desired effect. The revised procedures will result in a significant increase in the length of time required to collect Calibration Point data. The cost of establishing Calibration Points will increase and fewer stands will be field visited (for a given budget). Consequently, the accuracy and reliability of resulting photo-interpreted forest attributes will decline.</p>
Benefit of Change	Increased efficiency and reliability in the inventory systems.
Resources Required	Staff time

RIB Recommendation	<ul style="list-style-type: none">i) revise Standards to allow single plot ground calls in some situations such as even-aged pine stands, but require three plot calls in more complex stands (note: this item duplicates P14 ii)ii) minimum number of leading species sample trees will be one for single plot ground calls and three for three plot calls, to reflect the variability in stands where three plot calls are more appropriateiii) diameter limits should stay as is since the smaller stands do not resolve well on mid-scale photos. Ground observations should be used in these stands to minimise time spent where the call will only be useful for a single polygon, i.e. trees cannot be seen on the photo and cannot be compared to adjacent/nearby stands.iv) same as for iii)v) minimum plot diameter should stay at 3.99m so that variability in small stands is captured. Where there is an excessive number of stems/ha. follow approach suggested in iii)vi) minimum distance between plots should remain at 50m to increase the spread across the polygon. Stands with low variability will usually have one plot calls, while more variable stands will need more plots spread further apart.
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Client Comment

No comment from Jon Aleman:

Further comments from Frank Scheithauer:

The purpose of ground calibration points is to establish reference points in a very small proportion of forest polygons (usually 1 to 2% of the total) so that a photo interpreter can make reasonably accurate photo interpreted estimates of the very large proportion of non-field visited polygons.

- 1) **The purpose of a ground calibration point is not to accurately determine the vegetation attributes of a specific polygon.** Rather, the photo interpreter uses the measurements from a very small portion of a polygon he field visits in order to estimate the attributes of the whole polygon. He then compares these estimates to adjacent non-field visited polygons to estimate their attributes. Therefore, in practice, the vast majority of forest polygon attributes are photo estimates based on field estimates based on a few field measurements.
- 2) It is naturally intuitive to assume that a three-plot Calibration Point would be “better” than a one-plot Calibration Point. However, as far as I know, there is no statistical evidence to suggest that photo interpreted attributes based on a single plot are any less “accurate” than photo interpreted attributes based on three plots. Question- Dozens of strategic level inventories have been conducted over the past 30 years throughout the province. Some have been based primarily on single plot Calibration Points and others on multiple plot Calibration Points. Has anyone ever statistically compared the accuracy of the final inventory results?
- 3) More on - Are three plots per Calibration Point “better” than one? According to Kim Iles (*Establishing Polygon Accuracy* 1998) “inside a typical forest polygon, the variability can typically be on the order of 80% or more”. In order to accurately determine Within-Polygon Variation, Mr. Iles suggests that “30 to 50 plots” per established in a typical polygon. According to MSRM’s own standards, the recommended number of plots required to adequately sample Within-Polygon Variation is 30 to 32 plots (*Within-Polygon Variation Sampling Procedures* 2003). The conclusion I draw from this is that three-plot Calibration Points are not necessarily “better” than one-plot Calibration Points (i.e. neither approach can accurately account for all the variation within a polygon). However, for a given budget, more polygons can be field visited using one-plot Calibration Points as opposed to three-plot Calibration Points. Consequently, one-plot Calibration Points are more cost-effective and, therefore, should be the provincial standard (until such time as it can be statistically demonstrated that multiple-point Calibration Points are “better”).
- 4) The RIB recommends that Ground Observations be

Final Resolution	Implement RIB recommendations
Action	LB to lead update of manuals

Issue ID#	P13
Contact Info	Tim Salkeld: MSRM – RIB
Issue Description	<ul style="list-style-type: none"> i) Snags per hectare ii) Data Source code iii) Reference Year
Technical Lead	Na
Priority Assessment	Na
Reference Information	Oracle data model
Background	<p>Following the data modeling meeting that “defined the model for the operational database that will incorporate the update and VDYP7 structure”, three modeling issues were identified. In relative order of complexity they are:</p> <ul style="list-style-type: none"> i) Change the model to relate snags (VRI dead stems per ha) from the layer table to the polygon table. This is an modeling issue only and does not require a change to the attribution process. As there is no change to the attribution this does not have to be vetted through the change management process. ii) Data Source code: currently in VRI we collect a data source code for ecological information, species composition , leading species age, leading species height, basal area, and density (VRI Live Stems per ha). The proposal is to combine these to one data source code for the entire polygon. There is an existing business need to keep the data source codes as they are presently with individual codes for each component iii) Reference Year. Currently there are three data sources used to determine a year to begin projecting tree growth (reference year). The reference year is determined from the year of photography, the update height date and the update age date.
Benefit of Change	Improved data management
Resources Required	ii) Items i) and ii) are modelling issues not CM issues. Item iii) is a repeat of item iv) in P1
RIB Recommendation	<ul style="list-style-type: none"> i) In the revised data model relate snags to the polygon table ii) Model all data source codes iii) This field should be modeled as a "reference year" to the polygon. Rules for the translation of existing information to this field need to be developed. Conversion of existing and new photo interpretation data will be needed for the next 2 years. Date of photo needs to be retained as it is metadata.

Client Comment	<p>Paul Rehsler: Silviculture surveys are used to collect ecological information, species composition, leading species age, leading species height, basal area, and density; this would result in single data source for the entire polygon. The VRI data model could assign the same date to each individual data source code. The reference year for silviculture surveys would be the same as the update height and update age date and this is the survey date.</p> <p>Nand Kayshap: MSRM systems: Being done under VDYP7 implementation.</p>
Final Resolution	Implement RIB recommendation.
Action	This item is currently being addressed by TS.

Issue ID#	P14
Contact Info	<p>Mike Sandvoss: Timberline (Prince George) mks@timberline.ca phone: (250) 562-2628</p>
Issue Description	<ul style="list-style-type: none"> i) Field Calibration plot suitability ii) Three point calibration plots iii) Estimating attributes in calibration plots iv) Trees selected for age and height v) Recent cut block edge effects vi) Minimum radius for field calibration plots
Technical Lead	Matt Makar
Priority Assessment	Medium
Reference Information	VRI photo-interpretation standards

Background	<ul style="list-style-type: none"> i) The location and process of establishment of calibration plots is less important than the repeatability of the data obtained within the target polygons. For all principles listed in the 2003 VRI Ground Call Data Collection Procedures and Standards, the common theme is that Phase I calibration plots are to assist the interpreter in making better photo estimates of attributes using data collected on the ground or from the air. Currently, the focus seems to be on process rather than results. ii) Through this, more stands can be visited to facilitate an increased number of calibration points for a similar field budget. Single measure point plots with multiple prism sweeps do as good a job if not better than three point measure/count plots at sampling the variability of a stand within the context of providing 'calibration' information. This is a fact that has been proven repeatedly on projects completed with single point calibration plots. iii) Quality checking has shown that attempts to estimate attributes are usually very inaccurate iv) The wording of the current Standards and Procedures does not specify that trees selected for age and trees selected for height be the same trees Recently created edges (within two years) have negligible edge effect and should not be a consideration v) While the multiplier of smaller radius plots produce more gross results, the option should be left open and explained more clearly why a half sweep of a 3.99m radius fixed plot should be used instead of a smaller radius plot.
Benefit of Change	See recommendations
Resources Required	Staff time
RIB Recommendation	<ul style="list-style-type: none"> i) No comment. No specific change proposed. ii) Same issue and recommendation as P12 i) iii) Currently, the only estimated parameter is diameters. Recommend measuring all diameters on one and three plot ground calls as is being done by most contractors iv) Reword the Manual to make clear that ages and heights must be taken on the same trees. v) No change. 30m is a reasonable distance to walk and more confusion could be created by trying to determine if a clearing is older than a given number of years since disturbance. Fix grammar in document; it's "rights of way" not "right of ways" vi) Same issue and resolution as P12 v)

<p>Client Comment</p>	<p>Jon Aleman: Trillium Pacific: There is no reason for a field plot to be incorrectly established (regardless of the overall purpose of field calibration process) so there is no reason not to continue the checking procedures. Checking should be started as early in the field calibration process as possible to ensure that useful feedback is received by the interpreter.</p> <ul style="list-style-type: none"> - This again should be a contractual issue. The standards and procedures should have instructions relating to 1 and 3 (or any number of) point ground calls. It should be up to the project officer to determine what arrangement is most suitable for his particular area. <p>iii</p> <ul style="list-style-type: none"> - has anyone actually quantified the negative effect that estimating (vs. measuring) diameters has on the final computed summary? The only values that are affected are (1) density (in variable radius plots) or (2) basal area and species composition (in fixed radius plots). Borderline tree diameters are a separate issue. I would argue that, for variable radius plots, there is little utility in measuring very large trees (save for borderline trees) since an accurate measurement, which alone can be a dubious assumption (e.g., butt flared Cedar old growth on a 60% slope), usually only contributes a very small amount of data by adjusting an already low density figure by a mere few trees. For other stands (i.e., of the more moderate dbh size variety), measuring each tree makes sense. <p>iv</p> <ul style="list-style-type: none"> - more or less agree. However, some areas where there is a high degree of rot, it would be plausible to allow an exception. Usually, these are older stands and an age prorated would suffice for rotten trees that were chosen based on height suitability. The sampler should make an attempt to core the “height tree”, but may wish to obtain a more accurate age on a nearby similar tree which may be of similar diameter, but not suitable for height measurement. <p>v</p> <ul style="list-style-type: none"> - For most polygons, there is no reason why the points cannot be spread out at 30m (minimum) intervals. However, exceptions should be made for very small polygons of a special interest type and also for polygons that have had nearby logging since the date of photography. Unless there is significant blow down, there should not be any measurable edge effect. I sampled a polygon (in a woodlot) last fall which I accessed about 1 hr by foot (on a strip of several plots) only to find that it had been selectively logged. There were now only several clumps of trees available to sample and the 30 m rule would have negated the option of getting any information at this site (since observations were not part of the contract). <p>vi</p> <ul style="list-style-type: none"> - I feel the sampler should have complete latitude in determining the size of the fixed radius plot that is used. With the advent of field computers (almost some 20 years ago now), I also fail to see the logic in limiting the radius to the select radii (3.99, 5.64, etc) simply
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Final Resolution	Implement RIB recommendation
Action	CM and LB to address specific issues and update manuals as required.

Issue ID#	P15
Contact Info	Jim Grace: MSRM – Kamloops
Issue Description	<p>In Okanagan TSA IFPA area four maps were done this year as a trial. This IFPA VRI uses Bioterrain mapping as a base and added VRI line work as needed. The bioterrain (which appears to be a good base for VRI) has up to 900 polygons per map and VRI adds approx. 600-800 more. The OK IFPA wanted a "more operational" map, resulting in a high polygon count to avoid lumping types or leaving out features that add to operational value (swamps, small lakes, etc.). To reduce costs, one area to explore is how and what is collected during field work. The IFPA gathered as much of their cruise data as they could find and had a contractor sort it, resulting in hundreds of potential recent data points; Care must be taken to ensure that the attributes represent the specific polygons. The current Okanagan inventory is 30+ years old, so the old PSYU data sources have very limited usefulness. Single point ground calls were used instead of 3 point, which allowed the contractor to spread out ground visitation over more of the area. After review of 3 of the maps, it is felt that use of Cruise data, reducing formal VRI Ground calls (use one point calls) and increasing ground observations (do prism sweep and collect species composition, age and heights, other?) allows for greater field visitation and provides more reference points to assist the photo interpreters work. Use of cruising field crews at lower costs than VRI crews could increase the number of observations captured.</p>
Technical Lead	Matt Makar
Priority Assessment	Medium
Reference Information	VRI photo-interpretation standards
Background	Allow single point ground calls as alternative to 3 point calls. Utilize suitable cruise data to supplement interpreters' ground calls and observations
Benefit of Change	Improved reliability in the inventory
Resources Required	Staff time
RIB Recommendation	This item supports the item proposed in P14 (ii)

Client Comment	<p>Jon Aleman: Trillium Pacific: Cruise data was incorporated during the first VRI operational pilot project (Boston Bar 1995). It served as an excellent ancillary data source and I see no reason why it could not be a part of every reinventory. It would not serve as a substitute to field visitation by the photo interpreter, since the ground and air calibration stage serves as an iterative educational process in addition to simply collecting field data. But having cruise data available before the field work stage, would be very useful as it would give the interpreters advance knowledge of much of the local knowledge (especially stand ages) that they are attempting to attain. There is no question that cruise data is helpful during the estimation stage.</p> <p>With the movement towards a standardized method of digital data submission (e.g., XML), it should become relatively easier (and less expensive) to acquire useful cruise data.</p> <p>Regarding single point ground calls, again I feel it is a contractual issue.</p>
Final Resolution	This is a contract administration issue.
Action	No further action required.

Issue ID#	P16
Contact Info	Chris Mulvihill: MSRM - Nelson
Issue Description	Improving accuracy of Phase 1 for operational purposes
Technical Lead	na
Priority Assessment	Low
Reference Information	na

Background	It would be nice to improve the accuracy of the Phase 1, but I don't know what a workable solution is that will not cost industry a lot more money. The only thing that I can think of that will improve the work is having the interpreters spend considerably more time on the ground than they currently do. They may even want to do two passes at fieldwork; once before the attribute estimation, and a second time to check their estimates after a map has been attributed.. It is important to remember that the inventory is strategic; it is not an operational inventory. If licensees want an operational inventory for their entire operating area, then they must be prepared to pay for it. Tightening up the standards will not make much of a difference. We are still checking one interpreter's estimate against another. If we want to check estimates by doing fieldwork then we need to be prepared for a lot more projects not meeting the required accuracy. Maybe the current product is the best we can achieve using photo interpretation and we are fooling ourselves into thinking that we can do any better using 1:15,000 mid-scale photography. I would like to see the results from field checking some of the inventories that used 1:30,000 or 1:40,000 photography in softcopy.
Benefit of Change	
Resources Required	Na
RIB Recommendation	This is not a Change Management item but a response to other input regarding accuracy of Phase 1 VRI work. No further action appears necessary.
Client Comment	This issue is of a general nature and was not sent for client review
Final Resolution	Comment only
Action	No action required.

Issue ID#	P17
Contact Info	Keith Tudor: MSRM - RIB
Issue Description	Update of contract documents
Technical Lead	Keith Tudor
Priority Assessment	low
Reference Information	Documentation
Background	Examples of contract templates (e.g. RFPs, Schedule A's) are not currently on the Web. They were pulled because they were out of date. There is a risk that contracts may be signed that do not reference the correct standards, in which case data may be received that will not load to the LRDW. Contact Centre staff have suggested that these documents should be updated and placed on the web.
Benefit of Change	Increased confidence in the data.
Resources Required	Staff time.
RIB Recommendation	Not a CM issue, but a need to improve documentation on the Web. Contract templates should be updated and placed on the Web.
Client Comment	This issue is of a general nature and was not sent for client review

Final Resolution	Implement RIB recommendation
Action	MM to provide update on the status.

Issue ID#	P18
Contact Info	Chris Mulvihill: MSRM - Nelson
Issue Description	Retrofit standards
Technical Lead	Chris Mulvihill
Priority Assessment	Low
Reference Information	Photo interpretation, Standards documentation
Background	There continues to be retrofitting of older forest cover inventories to bring them to Phase 1 VRI standards. The standards in place for this need to be reviewed for relevancy and rewritten as they currently do not provide adequate guidance or detail.
Benefit of Change	Improved reliability in the inventory
Resources Required	Review and rewrite Standards document
RIB Recommendation	Currently, one retrofit project is underway in Nelson (TFL 3), but it is unlikely there will be any further retrofitting as it appears that there would be no savings of time or money. FIP based inventories are now at least 9-10 years old and have probably passed the point where a retrofit makes sense. Decision required from management about whether to remove retrofit option from the Standards.
Client Comment	This issue is of a general nature and was not sent for client review.
Final Resolution	Deferred: This issue to be addressed by VRI Steering
Action	CM to develop a summary of pros/cons associated with the continued support of a retrofit standards.

Issue ID#	P19
Contact Info	Matt Makar, MSRM - Prince George
Issue Description	Phase 1 QA standards
Technical Lead	Matt Makar
Priority Assessment	na
Reference Information	QA standards

Background	VRI QA procedures for Photo interpretation conflict with the VRI photo interpretation standards in a number of places. For example: In Appendix A.1 of the QA procedures, it talks about values within 15%, 20% etc, and the scores for them, but if you look at the photo interpretation standards, it is done differently. For leading species age, the QA procedures states scores for values within 15% or 20%. Then in QA standards, it says that the age must be within 20 years for tree layers between 40 and 251 years old. If you use the Standards method, when a contractor says that a stand is 215 years old and QA says it is 251, it will fail (36 years), but in the QA procedures it says it would get full points because it's within 15%.
Benefit of Change	Reduced confusion in QA process
Resources Required	
RIB Recommendation	Given that: a) MSRM does not perform QA, and b) we are responsible for setting the standards around QA, these two documents need a major re-write (or at least some clarification) as was done for the Phase II ground and air calls.
Client Comment	This issue is of a general nature and was not sent for client review.
Final Resolution	Differed: This issue is being assessed
Action	LB to lead review

Issue ID#	P20
Contact Info	Earl Spielman, Inventory Forester West Fraser Mills Ltd.- Quesnel Division Earl.Spielman@westfraser.com Phone: (250) 992 0894
Issue Description	Capture of ecological data where TEM or PEM already exists
Technical Lead	Laurence Bowdige
Priority Assessment	Medium
Reference Information	Photo-interpretation and planning standards documents
Background	Interpretation of ecological and geomorphic (bioterrain) attributes is redundant for areas that have TEM or PEM. Given that there is almost no training for interpreting these attributes and bioterrain is mapped by qualified ecologists or geologists, why is the interpretation of these attributes mandatory?
Benefit of Change	The potential short term benefit of dropping these attributes may reduce photo-interpretation workload. These savings may be offset by the costs associated with merging the bioterrain attributes back to the VRI database.
Resources Required	Staff time

RIB Recommendation	There is an issue with PEM attributes, as opposed to TEM, because PEM is a modelling not a mapping, exercise. Need to separate the issue into two parts: TEM data vs. modelled PEM data. In the latter case, VRI should continue to capture the terrain and eco attributes
Client Comment	<p>Lynne Bonner: I am unable to comment on the direct technical merit of this issue, however in developing State of the Environment reports WLAP relies on the ecosystem products derived from VRI and PEM/TEM inventories. We prefer to use regionally based information, but only if it is consistent and reliable throughout the entire region.</p> <p>Del Meidinger: It is not entirely clear to me which attributes are being considered for redundancy. I am guessing surface expression and modifying processes and perhaps soil moisture and nutrient regimes. I think the suggestion is probably OK for areas with TEM maps, however, the resolution of 1:50k TEM vs. 1:20k TEM should be considered. I would recommend that VRI continue to collect SMR and SNR for projects that overlap with 1:50k TEM. For areas with PEM, I would continue to collect the attributes, especially SMR and SNR, as these could be very helpful to improving the PEM.</p> <p>Dave Clark: There are real difficulties in trying to import attributes from one set of polygons (e.g., bioterrain or TEM) to another (e.g., VRI). This is compounded if there are different components within those polygons. I concur that the if the attributes are seen to be used by clients who interpret values from VRI, they should continue to be entered.</p> <p>Jon Aleman: Trillium Pacific: I agree with the (Jan 29) discussion. Again making exceptions to which attributes are collected under particular circumstances complicates the process. If the existing TEM or PEM values are felt to be more reliable while reporting on VRI data, then they can be spatially overlaid and used by any particular client</p> <p>It would not hurt, however, to make any existing TEM and/or PEM data available to the VRI photo interpreters at the start of a project. This would provide some basic ecology ancillary data and also provide a secondary check of the ecological mapping; both these factors would help to approach better consistency</p> <p>Frank Scheithauer: Agree with RIB Recommendation</p>
Final Resolution	The integrity of the SMR/SNR attribute in the database must be maintained.

Action	DC to review options for data capture and standardization.
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