Field Verification of Priority Old Forest Deferral Areas: Technical Guidance

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(Errata added Nov 3, 2022)

Ministry of Forests

BRITISH COLUMBIA | Ministry of Forests

ERRATA

page 18, Spatial Data section, removed reference to KML and KMZ files as accepted spatial data format

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BACKGROUND

In September 2020, the Provincial government committed to implementing all 14 recommendations from the Old Growth Strategic Review report: A New Future for Old Forests.[1] Recommendation 6 was identified for immediate response: "*Until a new strategy is implemented, defer development in old forests where ecosystems are at very high and near-term risk of irreversible biodiversity loss,*" and the Provincial government engaged the Old Growth Technical Advisory Panel (TAP) to identify and advise on where deferrals should occur.

The TAP deferral mapping focuses on three categories of old forests:

- **Ancient Forests** are > 400 years old in ecosystems with *infrequent* stand initiating disturbances and > 250 years old in ecosystems with *frequent* stand initiating disturbances.[2]
- **Remnant Old Ecosystems** are Biogeoclimatic Ecosystem Classification (BEC) subzones/variants or BEC/Landscape Unit analysis[3] units with < 10% of the Forest Analysis Land Base[4] mapped as old forest.
- **Prioritized Big-treed Old Growth** represents the largest old trees in an ecosystem.

Additional information on the deferral mapping and criteria can be found in the TAP report and the TAP background and technical appendices. [5]

The Technical Advisory Panel's analyses to identify priority deferral areas used a 1 ha raster grid which resulted in a coarse-scale map of priority deferral areas for consideration at the provincial scale. The province subsequently converted this resultant data back to Provincial forest inventory polygons (Vegetation Resource Inventory) from which the raster analysis originated. **The polygon-based version of the Priority Old Forest Deferral Area mapping (also referred to as the "operational" or "vector" Priority Old Forest Deferral Area mapping) is available for download from the BC Data Warehouse[6]**

[1] Gorley, A and G. Merkle. 2020. A New Future for Old Forests: A strategic review of how British Columbia manages old forests within its ancient ecosystems. Submitted to the Minister of Forests, Lands, Natural Resource Operations, and Rural Development.

[2] Infrequent stand initiating disturbances refers to NDT 1, 2, and 4 BEC subzones/variants; frequent stand initiating disturbances refers to NDT 3. See Appendix 2 for more information on how BEC relates to deferrals.

[3] All analyses using BEC are based on the newest provincial biogeoclimatic mapping, BEC version 12, released in September 2021. See Appendix 3 for more information on BEC and priority deferrals.

[4] FALB is defined in the TAP report.

[5] TAP Report: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/old-growth-forests/summary_for_g2g_package.pdf

TAP Supplemental and Appendices: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/old-growth-forests/og_tap_background_and_technical_appendices.pdf

[6] The current view of the Priority Old Forest Deferral Areas map can be downloaded at https://catalogue.data.gov.bc.ca/dataset/f257ca4a-0c33-4eb2-9da8-21dff4482f58

and must be used for cut block assessments and any additions to or deletions from the Priority Old Forest Deferral Area mapping[7].

Even with the "smoothed lines" in the operational Priority Old Forest Deferral Area mapping, there will be areas identified for deferral that do not contain at-risk old forest, and there will be areas that contain at-risk old forest that are not identified in the deferral mapping. This document provides an overview of processes and procedures recommended for field verification at the stand scale.[8]

SCOPE

This document guides forest professionals and government decision makers through the process of identifying whether proposed cut blocks will be deferred temporarily to avoid harvesting of old forests at risk of irreplaceable biodiversity loss.

The guidance is applicable to forest operations that are planned within an area where Indigenous Nations are in support of deferrals following the TAP methodology. This guidance does not replace requirements in land use orders, higher level plan orders, government action regulations (GAR), or any other guidance, requirements, or best practices for conservation and resource stewardship.

The document outlines the processes to:

- Evaluate the need for field assessments where cut block areas overlap areas identified as Priority Old Forest Deferral Area, which may be any combination ancient forests, remnant old ecosystems, and priority big-treed old forest.
- Stratify stands for evaluation against priority old forest deferral criteria.
- Use field data to compare on-the-ground measures to priority old forest deferral criteria, including best practices for collecting tree diameters, heights, and ages.
- Submit data to government, including maps, spatial data and rationales for deletions from (and associated replacement areas adding to) the Priority Old Forest Deferral Area mapping.

Deferrals are a short-term pause in harvesting. Longer-term approaches to old forest management will be addressed through implementation of the remaining recommendations in the Old Growth Strategic Review. The approach and data presented here are not intended to provide long-term data for describing the characteristics of ancient and old forests in B.C. because they do not capture the full complexity in stand structure, function, or composition known to occur within B.C.'s diverse old forests.[9]

OVERVIEW OF THE FIELD VERIFICATION PROCESS

The field verification process includes several steps, including office- and field-based assessments, and it can be applied at both the reconnaissance stage and prior to submitting a Cutting Permit. At the

[7] Areas referred to as either "Priority Old Forest Deferral Area mapping", "mapped as deferrals", "priority deferral mapping" or are those areas shown on the current view of the Priority Old Forest Deferral Areas map (see footnote 6 for URL to access spatial data).

[8] The priority deferral criteria used throughout this document are based on the data analyses that resulted in the original ~ 2.6 million hectares of priority deferral mapping provided by the TAP.

[9] Appendix 1 provides an overview of the stand structural characteristics most frequently associated with old forests in British Columbia.

reconnaissance stage, forest professionals can determine the likelihood of a cut block (or portion of a cut block) meeting priority deferral criteria. At the Cutting Permit submission stage, forest professionals can apply the recommended methods to collect data and develop a rationale that will be submitted to government. Figure 1 shows an overview of the process. Detailed procedures are described in the remainder of this document.

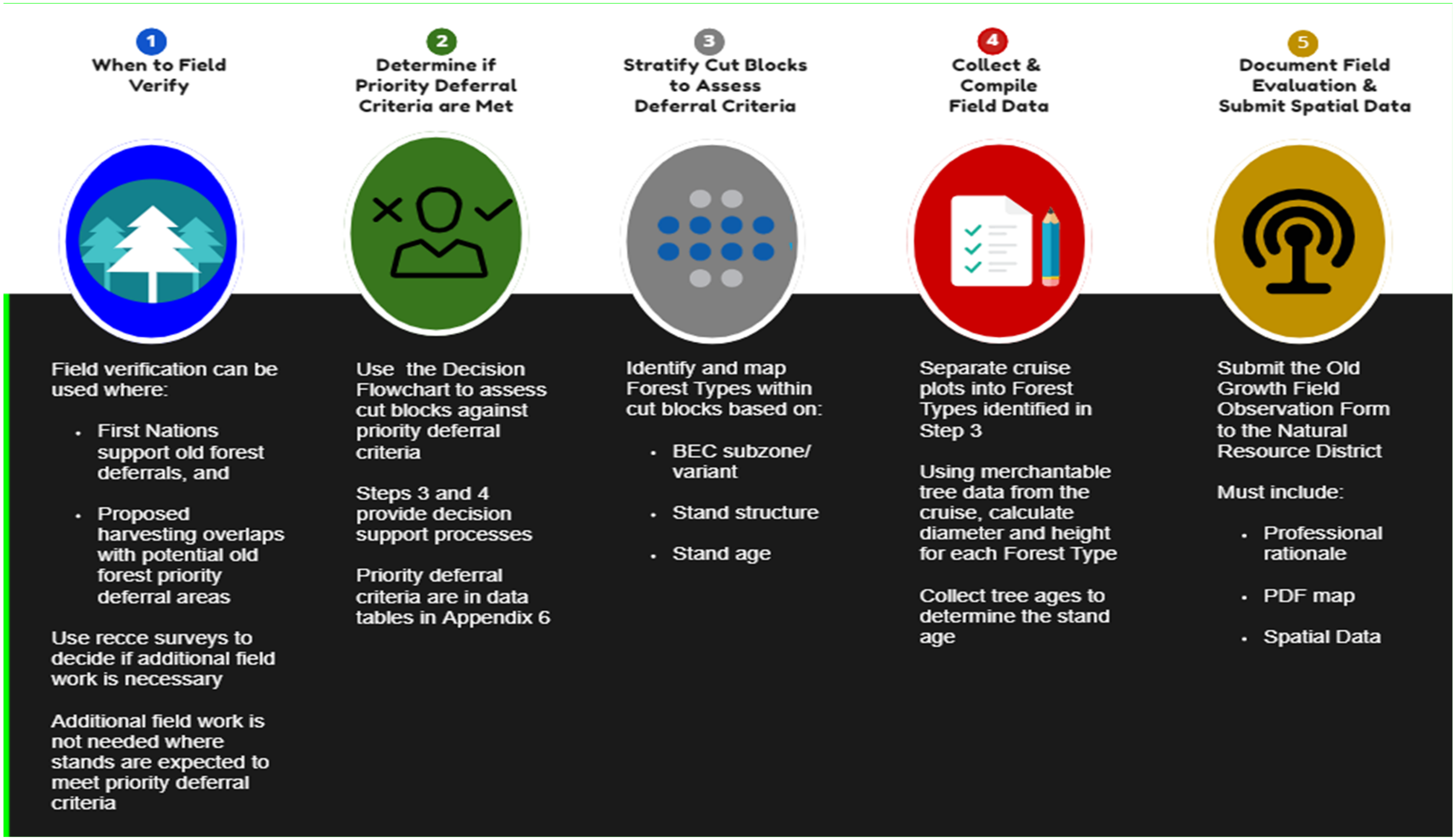


Figure 1. Overview of the field verification process.

STEP 1 – WHEN TO USE FIELD VERIFICATION

Complete field verification where:

- Indigenous Nations are in support of deferrals following the TAP methodology **and**,
- Harvesting is proposed in an area mapped as Priority Old Forest Deferrals that may not meet the deferral criteria, and
- An area outside the deferral mapping is identified as a replacement for areas taken out of the Priority Old Forest Deferral Area.

No extra field work is required in areas mapped as Priority Old Forest Deferrals if no harvest is planned in these areas.

Field verification can be used to:

- Review and remove areas on Priority Old Forest Deferral Area maps where there is uncertainty about whether the stand meets priority old forest deferral criteria using field data.
    - Stand attributes measured in the field may differ from priority deferral maps, and some stands may not meet deferral criteria. This may be due to inconsistencies in the provincial forest inventory, recent disturbance not yet mapped, or fire mapped at a lower severity than occurred.10
- Review and add areas of at-risk old forest to priority deferrals that are observed on the ground but not shown on the maps.
    - Strategic inventory mapping may be incorrect at the operational (field) scale and stands may meet the priority old forest deferral criteria based on stand age and/or tree size attributes measured in the field.
    - The expectation is that harvesting will be deferred in stands of old forest that:
        - Are inside the Priority Old Forest Deferral Area mapping and meet the criteria of ancient, remnant old, or big-treed old growth, or
        - Are outside the priority deferral mapping, and meet the criteria of ancient, remnant old, or big-treed old growth and are identified as "replacement" for areas harvested within the Priority Old Forest Deferral Area mapping that are demonstrated not to meet the priority deferral criteria.

RECONNAISSANCE ASSESSMENTS

There are two levels of field verification – initial reconnaissance assessments and full field verification. Reconnaissance assessments can be used to determine whether a stand meets priority deferral criteria or requires additional data collection and compilation for full field verification (Table 1). The final decision to proceed with harvest plans is **not** made at the reconnaissance stage. When priority deferral criteria are not met and a tenure holder plans to proceed with harvest plans, the final decision is made

[10] Areas that recently burned with low severity and unburned areas within fire perimeters are likely to continue to provide old forest values and have been included in deferral analyses and mapping.

after additional field data are collected and compiled (See Step 4). This is because reconnaissance surveys are an informal process and vary by operator. Consistent data collection standards are needed to confirm whether priority deferral criteria have been met or not.

Use field verification for:

- New blocks under development or,
- Existing blocks that are part of Cutting Permits that have been planned, submitted, or approved.
- Areas being considered for as replacement Priority Old Forest deferral areas

In either case, verification begins with reconnaissance-level assessments of stands that have been stratified by Forest Type (see Step 3). The assessments determine how likely it is that deferral criteria will be met. Before doing an assessment, refer to the:

- Priority Deferral Decision Flowchart (see Step 2)
- Expected forest stratification process (see Step 3)
- Assessment criteria (see Appendix 6).

Appendix 1 also provides an overview of the stand structural characteristics most often associated with old forests in B.C. Collecting tree age core data is strongly recommended during reconnaissance (see Step 4 and Appendix 4).

Table 1. Overview of the reconnaissance process for assessing next steps in the field verification process

Reconnaissance Assessment		Indicators		Next Steps
Area is mapped as Priority Old Forest and expected to meet priority deferral criteria	→	Ancient Forest	→	Stand is determined as meeting deferral criteria; no further assessments are needed
	→	Old Forest (or Older Mature Forest) in Remnant Old Ecosystems		
	→	Has many trees that are large for the ecosystem		
Area is mapped as Priority Old Forest and may not meet priority deferral criteria	→	Trees are smaller and/or younger than expected for priority deferrals in the ecosystem	→	Full field verification can be used to collect field data to determine if the stand (or Forest Type) meets deferral criteria where harvesting is planned or proposed

[a] If field crews identify that a stand will meet deferral criteria in a reconnaissance level assessment, additional field verification data collection is not required. A professional rationale can be used to document the occurrence of a priority deferral area.

For each Forest Type (stratified in Step 3) use reconnaissance surveys to identify whether priority deferral:

- Criteria are clearly met,
- Mapping is incorrect, and the stand will not meet criteria, or
- Additional information is required.

Figure 2 is a schematic of the decision-making process at the reconnaissance stage.

Reconnaissance surveys should be done in stands mapped as priority deferral areas and in stands that are not mapped but are being considered for replacement areas by forest professionals.

There is no need to collect field verification data if a stand is not currently mapped as a Priority Old Forest Deferral or is not being considered as a Replacement Priority Old Forest Deferral Area.

The comprehensive field measurements described in Step 4 are needed only where harvesting is planned in areas that are likely to meet priority deferral criteria. "Likely to meet" includes areas:

- Shown on the Priority Old Forest Deferral Area map (consult the current view of Priority Old Forest Deferral Areas map[6])
- Not mapped as Priority Old Forest Deferral Area but identified as likely to meet priority deferral criteria necessary to be considered as a Replacement Priority Old Forest Deferral Area.

The full field verification data are expected to be collected before submitting a Cutting Permit. The data submission expectations are described in Step 5.

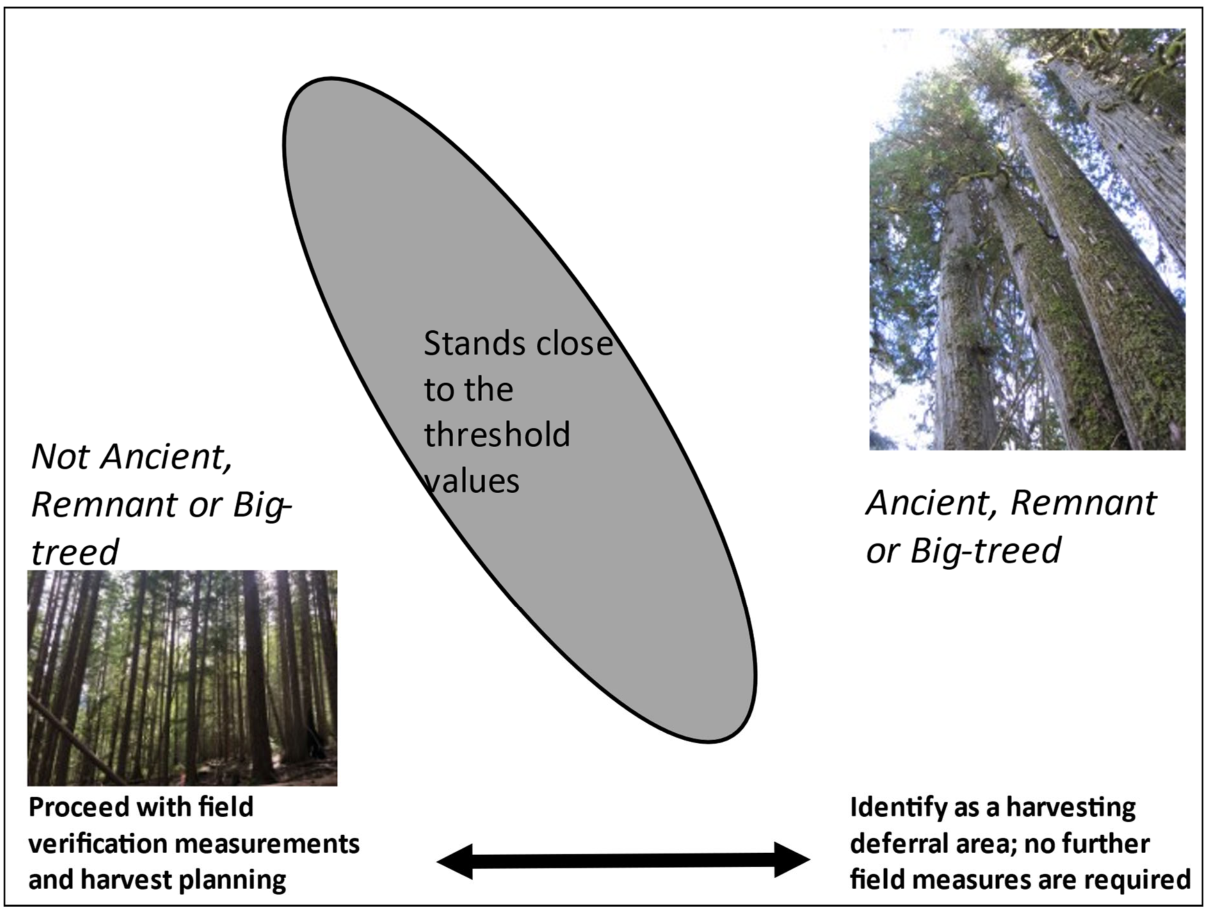


Figure 2. Schematic of reconnaissance-level decisions.

STEP 2 – DETERMINE IF PRIORITY DEFERRAL CRITERIA ARE MET

The Priority Old Forest Deferral Area map[11] is based on assessments using stand age, diameter, and height estimates from provincial forest inventory data (also referred to as VRI). Minimum values are from the TAP priority deferral analyses[12] and are provided for each BEC subzone/variant in Appendix 6. The Priority Deferral Decision Flowchart presented here is designed to identify stands that meet the criteria of short-term deferrals; longer-term approaches to old forest management will be addressed through implementation of the remaining recommendations in the Old Growth Strategic Review.

The Priority Deferral Decision Flowchart considers the following information:

- BEC subzone(s)/variant(s)
- Landscape Unit
- Forest Type stratification for the cut block (see Step 3)
- Priority deferral mapping[6]
- Stand age, diameter, and height data (see Step 4)

For Big-treed Old Forest and Big-treed Older Mature Forest:

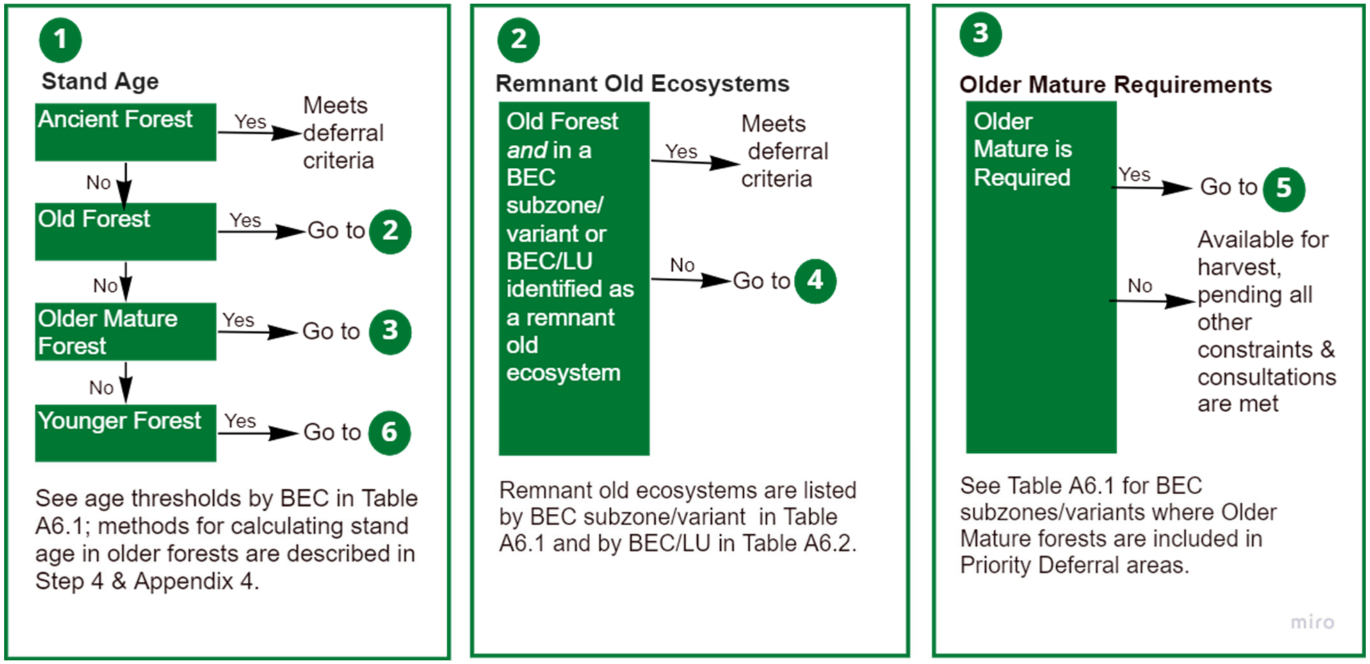
- Both diameter and stand height must be less than the values listed in Table A6.1 for a Priority Old Forest Deferral Area to be available for harvest.
- Both diameter and stand height must be equal to, or more than, the values listed in Table A6.1 for an area to be added as a Replacement Priority Old Forest Deferral Area.
- When only one of diameter or stand height exceed the values in Table A6.1, the stand is not suitable as Replacement Priority Old Forest Deferral Area.

Big-treed criteria apply where a stand also meets the age-based criteria, as provided for each BEC subzone/variant in Table A6.1.

To maintain consistency with the inventory measures used in the TAP process, stand diameter is assessed using **Quadratic Mean Diameter (QMD)** of merchantable trees.

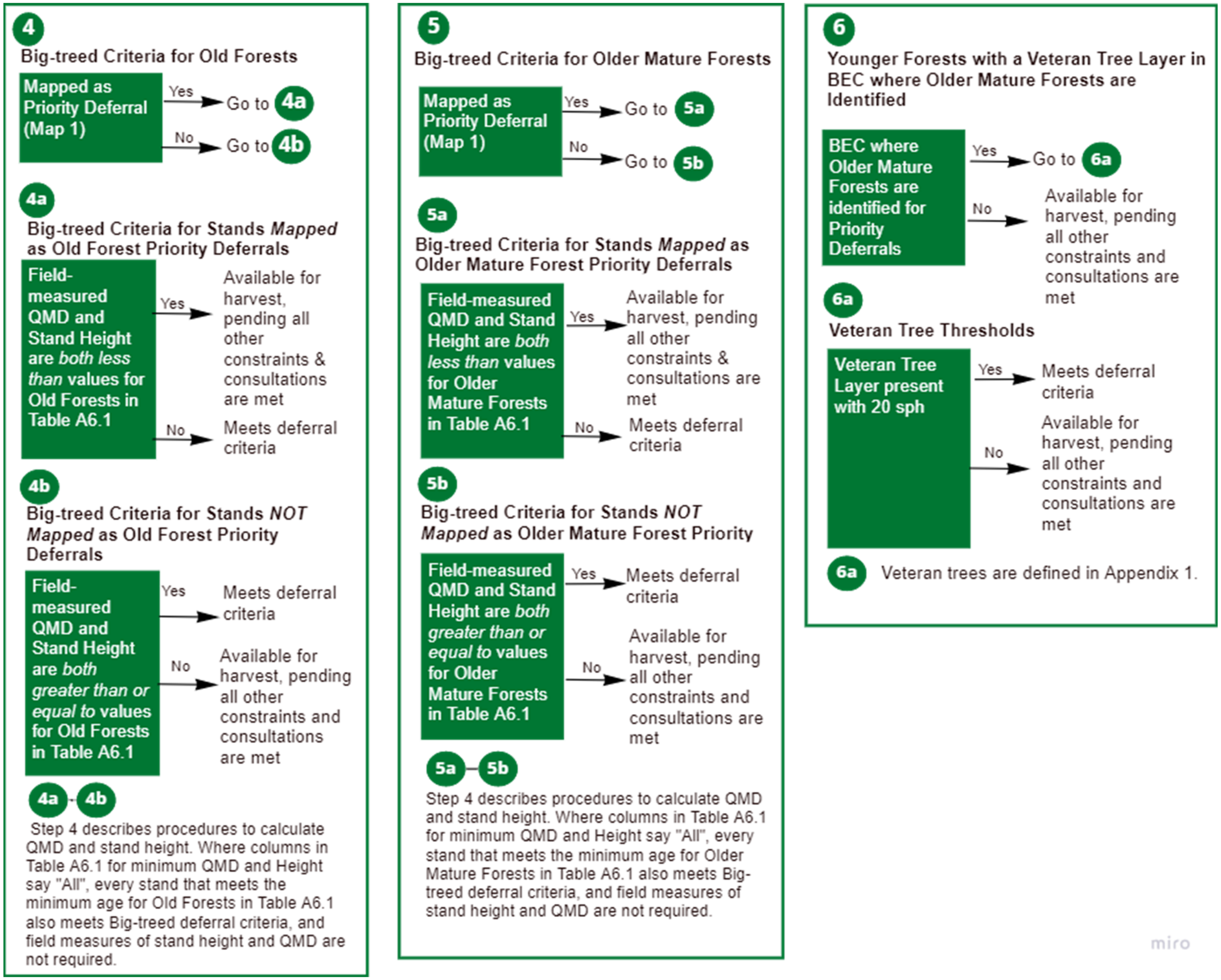
[12] The Priority Deferral Analysis resulted in ~ 2.6 million hectares of unprotected areas proposed for temporary harvest deferral, including ancient forests, remnant old ecosystems, and priority big-treed old growth.

Priority Deferral Decision Flowchart[13,14]



[13] Note that "mapped" in the decision flowchart refers to polygons that are shown in the current view of the Priority Old Forest Deferral Areas map, including areas that are mapped as Priority Big-treed Old Growth, Ancient, and/or Remnant Old Ecosystems. See footnote 6 for URL to access spatial data.

[14] "Younger" forests in part 6(a) refer to those that are younger than the age of Older Mature Forests, as specified by BEC subzone/variant in Table A6.1, and > 80 years old.


4
Big-treed Criteria for Old Forests
Mapped as Priority Deferral (Map 1)
Yes
Go to 4a
No
Go to 4b
4a
Big-treed Criteria for Stands *Mapped* as Old Forest Priority Deferrals
Field-measured QMD and Stand Height are *both less than* values for Old Forests in Table A6.1
Yes
Available for harvest, pending all other constraints & consultations are met
No
Meets deferral criteria
4b
Big-treed Criteria for Stands *NOT Mapped* as Old Forest Priority Deferrals
Field-measured QMD and Stand Height are *both greater than or equal to* values for Old Forests in Table A6.1
Yes
Meets deferral criteria
No
Available for harvest, pending all other constraints and consultations are met
4a - 4b
Step 4 describes procedures to calculate QMD and stand height. Where columns in Table A6.1 for minimum QMD and Height say "All", every stand that meets the minimum age for Old Forests in Table A6.1 also meets Big-treed deferral criteria, and field measures of stand height and QMD are not required.
5
Big-treed Criteria for Older Mature Forests
Mapped as Priority Deferral (Map 1)
Yes
Go to 5a
No
Go to 5b
5a
Big-treed Criteria for Stands *Mapped* as Older Mature Forest Priority Deferrals
Field-measured QMD and Stand Height are *both less than* values for Older Mature Forests in Table A6.1
Yes
Available for harvest, pending all other constraints & consultations are met
No
Meets deferral criteria
5b
Big-treed Criteria for Stands *NOT Mapped* as Older Mature Forest Priority
Field-measured QMD and Stand Height are *both greater than or equal to* values for Older Mature Forests in Table A6.1
Yes
Meets deferral criteria
No
Available for harvest, pending all other constraints and consultations are met
5a - 5b
Step 4 describes procedures to calculate QMD and stand height. Where columns in Table A6.1 for minimum QMD and Height say "All", every stand that meets the minimum age for Older Mature Forests in Table A6.1 also meets Big-treed deferral criteria, and field measures of stand height and QMD are not required.
6
Younger Forests with a Veteran Tree Layer in BEC where Older Mature Forests are Identified
BEC where Older Mature Forests are identified for Priority Deferrals
Yes
Go to 6a
No
Available for harvest, pending all other constraints and consultations are met
6a
Veteran Tree Thresholds
Veteran Tree Layer present with 20 sph
Yes
Meets deferral criteria
No
Available for harvest, pending all other constraints and consultations are met
6a Veteran trees are defined in Appendix 1.
miro

IDENTIFY REPLACEMENT AREAS

Replacement areas should meet the replacement criteria outlined below:

- Replacement Priority Old Forest Deferral Areas must be of the same priority old forest type (Ancient, Remnant or Priority Big-Treed) as the Priority Old Forest Deferral Area being replaced.
- Replacement Priority Old Forest Deferral Areas must be within the same BEC subzone/variant and meet the field verification requirements of the Ancient, Remnant or Priority Big-treed area it is replacing
- Size, shape, and connectivity should approximate or be an improvement upon the Priority Old Forest Deferral Area being replaced.
- Replacement Priority Old Forest Deferral Area must be within the same landscape unit as the Priority Old Forest Deferral Area being replaced. Overall targets across the management unit should be maintained. Distance between the original Priority Old Forest Deferral Area and the Replacement Priority Old Forest Deferral Area should be minimized.
- Replacement should not result in Priority Old Forest Deferrals in areas with higher levels of human disturbance
- Replacement Priority Old Forest Deferral Areas cannot be placed in areas unavailable for forest harvesting

STEP 3 – Stratify the Stand into Forest Types Based on Ecosystem and Stand Structural Conditions

Final deferral areas will be based on forest attributes identified on the ground. Priority Old Forest Deferral Area mapping is based on provincial forest inventory polygons and deferral areas may differ from the mapped inventory data in many places. This occurs where the provincial forest inventory is not consistent with ground conditions. Before collecting reconnaissance or detailed field verification data and considering priority deferral criteria, proposed or approved cut blocks may need to be stratified.

> **"Stratification"** means the process of delineating strata boundaries within a subpopulation, where each stratum has unique characteristics such as species composition, height, stand volume or age. For the purposes of field verification, stratification should delineate changes in stand conditions related to the criteria of ancient and old forests as well as big-treed old and (where applicable) older mature forests.

For the purposes of Priority Old Forest Deferral Area **field verification, it is necessary to stratify cut blocks where more than one ecosystem (BEC subzone/variant) and/or Forest Type is present.**

Ecosystem stratification can occur at several spatial and conceptual scales,[15] but for consistency with old forest priority deferral analyses, stratification for field verification is by BEC subzone/variant. **Forest Types**, also referred to as Timber Types, are defined in the Cruising Manual (Section 2.8)[16] as: "*areas of similar inventory forest cover composition (e.g., first and second leading species by volume, age, height*

[15] Priority deferral criteria are determined at the BEC subzone/variant scale; changes in site series may influence delineation of Forest Types.

[16] https://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/timber-cruising/timber-cruising-manual

and site class)… Timber type polygons must be contiguous and unique to each cutblock…" Forest (Timber) Types are generally pre-stratified in the office using aerial photos (or LiDAR, where available). As described in the Cruising Manual, additional information on typing can be found in the 'VRI Photo Interpretation Procedures' manual.[17]

The suggested process for stratification of priority old forest deferral areas is:

- Overlay Priority Old Forest Deferral Area mapping, or areas that may meet priority deferral criteria, with proposed cut block(s).
- Stratify stands by BEC subzone/variant. Cut blocks that cross BEC subzones/variants must be stratified and assessed against the relevant priority old forest deferral criteria for each BEC subzone/variant (see Appendix 2).
- Pre-stratify Forest Types in the office using BEC and stand structural conditions, existing field data, aerial imagery, and/or LiDAR, if available (Figure 3).

Stratification should reflect:

a. **Changes in BEC**, where cut blocks are stratified when they cross BEC subzone/variant lines.
b. **Forest Type,** including changes in stand structural condition such as successional status or structural stage,[18] tree sizes, stand volume, tree species changes, and/or varying densities of veteran tree layers (where present); and/or
c. **Stand age**, where ancient, old, older mature, and younger portions of the stand are assessed separately.

Confirm and modify strata boundaries in the field through reconnaissance field assessments.

Forest Types delineated in this step will be used for assessments in all other steps.

There is no minimum size for a Forest Type polygon, although as described in Step 4, reconnaissance-level assessments may be acceptable for Types < 2 ha for the purposes of deferral field verification.[19]

[17] https://www2.gov.bc.ca/gov/content?id=D26F0E92D69745CAA8D7088DB803F458

[18] See Land Management Handbook 25 – Describing Terrestrial Ecosystems in the Field (2015), available for download at https://www.for.gov.bc.ca/hfd/pubs/docs/Lmh/Lmh25/Lmh25_2015.pdf.

[19] Timber type polygons that are 1.0 hectare or larger must contain at least 2 full measure plots and timber type polygons that are less than 1.0 hectare must contain at least 1 full measure plot (Section 2.2, Cruising Manual).

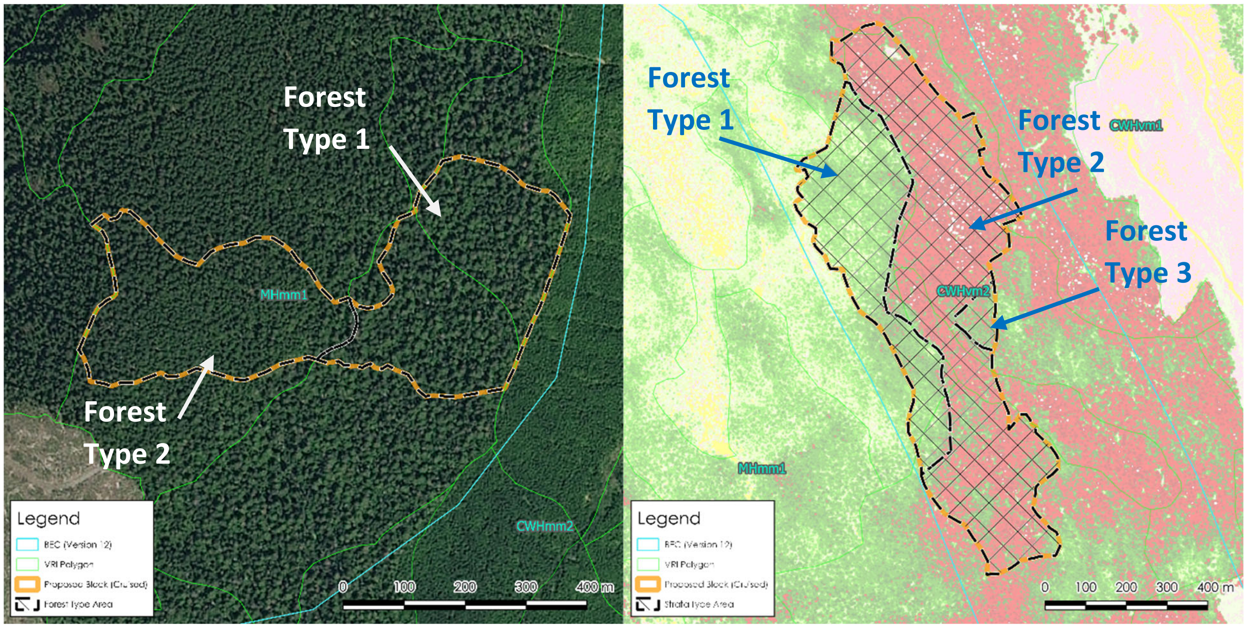


Figure 3. Forest Type stratification using aerial imagery (left) and LiDAR (right).

STEP 4 – COLLECTING AND COMPILING FIELD DATA

USE CRUISE DATA TO EVALUATE STRATIFIED STANDS: AUGMENT WITH ADDITIONAL DATA

Cruise data are needed only when cut blocks have already been identified, during reconnaissance stages, as unlikely to meet priority deferral criteria. Where reconnaissance surveys indicate priority deferral criteria will be met, deferral areas can be identified without additional data collection.

Cruise Plot Procedures for Deferral Areas (currently mapped areas or replacement areas)

For blocks that have already been cruised, review cruise data for the cut block and separate cruise plots that overlap with each of the Forest Types stratified as per Step 3. This may require stratification or re-stratification of the cruise to the Forest Type scale. Generate required summaries and evaluate age, height, and diameter criteria separately for each stratified Forest Type. Compilations for appraisal purposes are different entities from compilations for the old forest priority deferral process.

Determine whether the full measure plots provide sufficient coverage to evaluate the potential deferral area (e.g., stratified Forest Types from Step 3). All appraisal full measure plots within a Forest Type identified for field verification must be used to evaluate the criteria. Additional full measure plots are required when there is insufficient coverage for a Forest Type. For the purposes of assessing old forest priority deferral criteria, the following methods apply:

- Minimum coverage for the priority deferral process is defined as follows:
    a. Forest Types 20.0 ha or larger should contain 20 full measure plots or a density equivalent to a 100 m x 100 m grid.
    b. Forest Types less than 20 ha should have a density of measure plots equivalent to a 100 m x 100 m grid.

Existing count plots may be converted to full measure plots to meet the coverage requirements. If count plots are converted, all count plots within a Forest Type must be converted.

Where additional full measure plots must be located to meet minimum coverage requirements:

- Use the procedures in the Cruising Manual Section 2.4.
- Only information required for the priority deferral process must be collected in additional full measure plots or converted count plots (e.g., species, height, diameter, and age (where selecting trees to age core is described in the section below).
- Plots that are added for the priority deferral process do not affect appraisal data.
- The general standards and intent of the Cruising Manual must be followed when locating additional plots.

New cut block development follows similar processes. However, detailed Forest Typing is required at the Cruise Plan stage (see Step 3).

For modifications of existing cut blocks and development of new cut blocks, **final cut block submission to follow existing cruising and appraisal procedures**, as described in the Cruising Manual and relevant appraisal manuals.

Determining Stand Age from Tree Cores

Accurate tree ages are important for assessing stands relative to priority deferral criteria. Determining tree and stand ages in old and ancient forests can be difficult, and detailed guidance is provided in Appendix 4.

If the stand is clearly ancient or old, and this will lead to a deferral decision, ages do not need to be taken. This can be determined in the reconnaissance stage of block assessment (or re-assessment for cut blocks that were developed and/or approved prior to decisions to proceed with priority deferrals) (see Step 1) where a stand can be identified as meeting deferral criteria without further field data collection. If tree core ages are not collected to quantify ages in the field, the stand will be considered "old", based on the minimum ages in Table A6.1. If the stand structure indicates the likelihood that a stand may be ancient, collecting tree core data is strongly recommended to avoid accidental harvest.

Tree core ages of the oldest trees in the stand (i.e., Forest Type) are collected to provide a field-based estimate of the time since the last stand-replacing disturbance.[20] This differs from the cruising objective of determining the tree class in each measure plot to assign the correct loss factor table and maturity class to each tree (e.g., mature, old-immature, immature). There is rarely a need in cruise data collection to core or record ages for trees greater than 120 years old in the interior or 140 years old on the coast. Therefore, tree core ages using standard cruising approaches are not appropriate for describing the stand age of older mature, old, or ancient forests.

To determine the stand age of an old forest, age cores must be taken from the oldest living trees, which are most often those with the largest diameter. Field staff may choose to also age trees of additional species with smaller diameters to better understand stand dynamics (e.g., yellow-cedar or western hemlock may be smaller, but old(er) than faster-growing tree species in the stand).

To capture the stand age for comparison to the priority deferral criteria in Appendix 6, collect age cores from:

- at minimum, the five (5) largest diameter, living trees in the main canopy (excluding veteran trees), selected from all cruise plots within each Forest Type.[21]

The final age of the stand (cut block or Forest Type) is the average age of the five largest/oldest trees age cored in the main canopy (excluding veteran trees), where tree ages include growth to breast height (see Appendix 4).

When a proposed cut block (or Forest Type) is in a BEC unit where **Older Mature Forests** are included in priority deferrals (see Table A6.1), additional age cores must be taken from the **veteran tree layer** where the main canopy age is > 80 years old and there are > 20 stems per hectare of veteran trees:

- the two (2) largest diameter live veteran trees; this is in addition to the largest diameter trees cored in the main canopy (for a total of seven (7) tree cores).

[20] In many ecosystems, the oldest tree in the main canopy (excluding vets) will reflect time since disturbance. Mean age is used here for consistency with inventory ages.

[21] For cut blocks that have already been cruised, determination of the target trees to age core should be made in the office using existing tree diameter data from individual cruise plots for each Forest Type.

Ages for veteran trees will be used to confirm veteran status in the Priority Deferral Decision Flowchart in Step 2 of this document for assessing deferrals where Older Mature Forests are identified in deferrals (see part 6(a) of the Flowchart).

Expect to determine ages of veteran trees frequently in NDT 4 ecosystems (IDF, PP, driest ICH) and other BEC subzones/variants where Older Mature Forests are identified for priority deferral. See Table A6.1 for a full list of ecosystems where Older Mature Forests are identified for deferrals.

> Trees designated as "veterans" in the field must be living remnants that survived a previous stand-replacing disturbance. Veteran trees are generally much larger in diameter (and often height) than other trees in the stand.

Veteran trees do not need to be measured and counted for field verification in BEC subzones/variants where Older Mature Forests are not identified for deferrals. However, veteran trees often provide important stand level biodiversity and wildlife values when retained, and confirmation of veteran tree status can also ensure that the largest, oldest non-veteran trees are selected for assessment of stand age.

Note that an age core is not required at each cruise plot; the requirement for the largest/oldest trees applies at the Forest Type scale (or cut block scale for homogeneous blocks). Therefore, some cruise plots will not have any age core samples collected to assess the age of the stand, while the occasional cruise plot may have more than one tree aged.

Tree ages must be based on ring counts from age cores as well as an estimate of years for the tree to grow to breast height. **Apply the methods described in Appendix 4 to determine field ages to assess against deferral criteria.**

Calculating Stand Height and Quadratic Mean Diameter from Cruise Data

The calculation of stand diameter and stand height need to be done at the Forest Type scale, not at the cut block or Cutting Permit level. Compile a separate Type Summary Report (see Figure 4) for each of the Forest Types in the cut block, where stratification processes are outlined in Step 3. Compiled cruise data can be rounded to one decimal place (e.g., 55.4) for comparison with the values in Table A6.1.

Extract **stand height** values from cruise data using the "Avg Weight Total Ht" for each Forest Type being assessed. The compiled stand height from cruise data is the Lorey height and is calculated as the basal-area-weighted mean height of all merchantable trees within a cruise plot (e.g., Lorey's height = Sum (Ht * BA) / Total BA).

The **Quadratic Mean Diameter (QMD)** is recorded as the "Avg DBH (Live and DP)" in cruise compilation and is based on the merchantable diameters of trees in the cruise plots. QMD is a measure of the average tree diameter in a stand where greater weight is assigned to larger trees. QMD can be calculated using basal area (BA) or individual tree diameters. Both methods provide the same answer.

QMD is used for assessing field measures for each potential deferral area (e.g., Forest Type). There are two formulas for calculating QMD:

QMD Formula 1:

$$\sqrt{\frac{BA}{k * n}}$$

Where BA = stand basal area (in metres), n = number of trees, and k is a constant = 0.0000785.

QMD Formula 2:

$$\sqrt{\frac{\sum D_i^2}{n}}$$

Where D = diameter of the i[th] tree and n = number of trees.

Cruise compilation programs automatically calculate the QMD and report it as average dbh.

*** FOR APPRAISAL PURPOSES ***   P E R C E N T   R E D U C T I O N   A P P L I E D

Type Summary

Average Line Method	Grades: MOF Computerized	[illegible]
CONIFEX MACKENZIE	Computerized Decay	PSYU: Finlay
Licence Number: A15385 CP: G02	Computerized Waste	Region: 6 - Omineca
Project: 180250	Computerized Breakage	District: 04 - Mackenzie

Net Area: Type 1 (M):Sx(B1) 835, Plots in Type: 16, TUs: [A : 13.8]

		Total	Conifer	Decid	B	S	PL
Utilization Limits							
Min DBH	cm (M)				17.5	17.5	12.5
Stump Ht	cm (M)				30.0	30.0	30.0
Top Dia	cm (M)				10.0	10.0	10.0
Log Len	m				5.0	5.0	5.0
Volume and Size Data							
Gross Merchantable	m3	6384	6384		1544	3793	1048
Net Merchantable	m3	4940	4940		1023	3287	630
Net Merch - All	m3/ha	358	358		74	238	46
Distribution	%	100	100		21	67	13
Decay	%	13	13		24	9	13
Waste	%	4	4		8	3	4
Waste(billing)	%	5	5		12	3	6
Breakage	%	6	6		2	2	23
Total Cull (DWB)	%	23	23		34	13	40
Basal Area / Ha	m2/ha	45.7	45.7		11.9	26.0	7.9
Net VBAR	m3/m2	7.825	7.825		6.242	9.161	5.801
Stems/Ha (Live + DP)		[illegible]	609.7		173.2	283.4	153.1
Avg DBH (Live & DP)	cm	30.9	30.9		29.5	34.2	25.6
Snags/Ha							
Avg Snag DBH	cm						
Gross Merch Vol/Tree	m3	0.76	0.76		0.65	0.97	0.50
Net Merch Vol/Tree	m3	[illegible]	0.59		0.43	0.84	0.30
Avg Weight Total Ht	m	28.3	28.3		26.0	30.2	25.0
Avg Weight Merch Ht	m	[illegible]	23.4		20.7	25.1	20.3
Net Merch Vol/Log	m3	0.19	0.19		0.15	0.23	0.13
Gross Merch Vol/Log	m3	0.23	0.23		0.21	0.26	0.16
Avg # of Logs/Tree		3.34	3.34		3.01	3.67	3.10
Net Immature	%	23.2	23.2		12.7	31.0	
LRF and Log Summary							
Net Merch - Stud	%	28.0	28.0		32.6	22.9	47.3
Net Merch - Small Log	%	61.4	61.4		70.8	54.0	84.2
Net Merch - Large Log	%	38.6	38.6		29.2	46.0	15.8
Avg LRF All	bdft/m3	183.5	183.5		152.3	204.6	124.3
Statistical Summary							
Coeff. of Variation	%	45.9	45.9		89.7	65.5	140.9
Two Standard Error	%	24.5	24.5		47.8	34.9	75.0
Number and Type of Plots		MP =	16				
Number of Potential Trees		80					
Plots/Ha		1.2					
Cruised Trees/Plot		5.0					

Figure 4. Example of a Type Summary Report showing diameter (QMD) and height fields for use in priority deferral field verification.

STEP 5 – DOCUMENTING FIELD EVALUATIONS AND SUBMITTING SPATIAL DATA

Completing of a Field Verification Submission Form is required (see Appendix 7) for all cut block boundaries where Indigenous Nations have said yes to deferrals or are in general support of deferrals, and that:

- overlap with the current view of Priority Old Forest Deferral Area map[6] ; or
- are in areas to be added to the deferral mapping as a Replacement Priority Old Forest Deferral Area.

Submissions are to be sent to the appropriate Resource District office and must include:

- spatial files
- a PDF map(s)
- a professional rationale

PDF(s) and spatial files must identify polygon boundaries and indicate which areas are proposed as:

- Replacement Priority Old Forest Deferral Areas to the Priority Ancient, Remnant, or Big Tree deferral (marked "Replacement"),
- Priority Old Forest Deferral Areas that do not meet the deferral criteria (marked "Deletion").
- Priority Old Forest Deferral Areas that will remain unchanged (marked "Unchanged")

If Replacement Priority Old Forest Deferrals areas do not fit on a standard PDF map size along with their associated cut block (at the specified suitable scales), the replacement area must be shown on a separate PDF map along with a suitable overview map showing the location of the cut block and the replacement area.

Further spatial file and PDF map specifications are shown below.

Spatial data can be accepted as:

- shape files
- feature classes in a geodatabase

Spatial data must follow the same specifications as required for FTA data submissions (e.g., projected in BC Albers or UTM using NAD83 datum).

Table A7.1 in Appendix 7 provides the spatial data dictionary required to ensure consistent data formatting for spatial file submissions. Note that the ASSESSMENT_POLYGON_ID field in the data dictionary is unique to each spatial intersection of Forest Type and Priority Old Forest Deferral Area polygon within a cut block. The ASSESSMENT_POLYGON_IDs will form the base unit for calculating the hectares of Replacement, Deletion and Unchanged required for the Priority Old Forest Deferral Area Submission Form.

PDF map submissions must include the following data:

- Forest Type ID(s) and/or sub-Type ID(s);
- Priority old forest deferral area mapping.
- Field verification results, including “Replacement”, “Deletion”, and “Unchanged” polygons;
- BC Geographic Warehouse base layers (water features, survey parcels, district administrative boundaries, parks, active forest and crown land tenures, Biogeoclimatic subzone/variant, roads, labels);
- Biogeoclimatic zone(s), sub zone(s), and variant.
- A title block with a legend, Natural Resource District, Cutting Permit ID, Licensee, Cut Block Id; Date; North arrow;
- Map scale;
- Map datum (e.g. NAD83(CSRS)) and the Map Projection (e.g. UTM);
- Geographic (e.g. latitude/longitude) and/or Mapping Projection (e.g. UTM) graticule as required

Ensure that a suitable scale (i.e. 1:5,000 or 1:10,000) is used that clearly shows the area of interest and illustrates all applicable cut blocks and roads.

Information on professional rationales to support decisions/recommendations regarding deferrals is provided in Appendix 5, including an example. As described in Step 1, a professional rationale is sufficient for identifying areas that Appendix 3 of the field verification guidance meet deferral criteria during reconnaissance surveys. Field data collection (see Step 4) is required both in areas where harvesting is proposed within Priority Old Forest Deferral Areas demonstrated to not to meet the deferral criteria, and in areas identified as Replacement Priority Old Forest Deferral Areas.

Submitting the Field Verification Submission Form does not replace existing requirements, including those in the Cruising Manual, Cutting Permit and Road Tenure Administration Manual,[22] or Coast and Interior Appraisal Manuals. For example, when field verification results in changes to a portion of an existing/developed cut block, and remaining portions of the cut block are proposed for harvest, it may be possible to adjust the cut block boundaries in the field and on maps to harvest the remaining cut block areas, assuming best practices (e.g., maintenance of windfirm boundaries) are met. This may require the licensee to initiate a Cutting Permit amendment consistent with procedures described in the Cutting Permit and Road Tenure Administration Manual. The process is like that currently used where, for example, a goshawk nest is found. Appraisal data may need to be resubmitted consistent with guidance in the Interior and Coastal Appraisal Manuals and the Cruising Manual.

[22] https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/timber-tenures/cutting-permit-road-tenure-admin/cp_rp_manual_septermber_2020.pdf

APPENDICES

APPENDIX 1. STAND-LEVEL ATTRIBUTES OF OLD FORESTS IN BRITISH COLUMBIA

This section provides a reference to provide forest professionals with high-level information on the typical stand structural characteristics of old forests in British Columbia. This information supports reconnaissance level assessments and will not replace the quantitative field verification information required where a cut block overlaps with a priority deferral area.

It is recognized that ecosystems are highly variable, and not all old forests will have the same or all of the characteristics described here. The most common stand-level attributes associated with ancient, old, and older mature forests are listed below. These are most common in ecosystems with long timeframes for stand development.

- **Stand age:** Time is a critical component of older forests. Time is required for trees to grow larger and taller and for forests to develop increased complexity. Fast-growing trees can reach large sizes in shorter times, but they rarely contain the unique features of old-growth trees. Age-based thresholds for ancient, old, and older mature forests are provided for ecosystems based on Natural Disturbance Type (NDT). Ages for ecosystems with infrequent stand-initiating disturbances (NDT 1,2, 4) are > 400 for ancient forests, > 250 years for old forests, and > 200 years for older mature forests. Ages for ecosystems with frequent stand-initiating disturbances (NDT 3) are > 250 for ancient forests, > 140 years for old forests, and > 120 years for older mature forests.
- **Large-diameter, old trees:** large trees are a key element of old forest structure. They provide unique habitats that are required for larger species (e.g., large trees can provide adequate space for black bears to hibernate); growth takes time, and time frequently allows for unique tree forms to develop. “Large” is relative to each tree species and to the ecosystem within which a tree grows. For this reason, large-diameter trees should be evaluated in comparison to forests within the same BEC subzone/variant and site series.
- **Unique tree morphology** associated with older ages and large trees includes:
  - Internal decay cavities used for denning and nesting wildlife species
  - Broken, dead, or forked tops and large-diameter tree branches that provide perching and nesting sites
  - Thick bark and large loosening bark slabs important for bats and some bird species
  - Microhabitats for the establishment of rare plant, moss, and lichen species.
  - Scars and other pathogen indicators
- **Tall trees**: Tree height tends to increase most rapidly in younger forests. Trees typically allocate fewer resources to height growth and more resources to diameter growth as the mature. Forests with taller trees tend to occur on more productive sites.
- **Snags:** Old forests often have large-diameter snags in a range of decay classes
- **Coarse Woody Debris (CWD):** Old forests often have large-diameter logs in a range of decay classes. Hollow logs and upturned root wads provide specific habitats

- **Canopy gaps**: Disturbances (e.g., insects, diseases, wind) make room for smaller trees to release into upper canopy positions and create small openings and horizontal variability.
- **Vertical and horizontal complexity:** Multi-layered, all-aged stands that includes a range of tree sizes, both in height and diameter
- **Long-lived tree species:** The autecology, or internal characteristics of tree species are important for the development of old forests. Old forests are typically comprised of longer-lived species. Shorter-lived species, such as lodgepole pine and broadleaf species (e.g., trembling aspen, cottonwood, balsam poplar, and paper birch) tend to form old forest stands in ecosystems with frequent stand-initiating disturbances where "old" occurs at an earlier age (e.g., > 140 or > 120 years).

VETERAN TREES

Veteran trees provide habitat for a variety of organisms and are particularly important in landscapes where very little old forest remains. Veterans are those that survived past stand-replacing disturbances. They are of an older cohort (e.g., age class) and have a larger diameter and/or height than the main stand. Multi-aged, multi-layered stands do not generally have "veteran" trees but may have remnant trees that have survived small-scale past disturbances.[23]

The presence of veteran trees can provide some of the functions associated with older forests, including habitat for species that require large cavities in trees for reproduction or survival. Forests with veteran structure should be considered for old forest deferrals, particularly where there is very little old forest in an ecosystem (e.g., in Remnant Old Ecosystems). As described below, veteran trees often provide key old forest functions in ecosystems with frequent stand-replacing disturbances (NDT 3) and historically fire-maintained ecosystems (NDT 4).

The characteristics of veteran trees and their contribution to old forest values will vary based on the ecosystem.[24]

OLD FORESTS IN ECOSYSTEMS WITH FREQUENT STAND-REPLACING DISTURBANCES – NDT 3

In ecosystems with frequent stand-initiating disturbances[25], old forests may not contain all of the features described above. Some old forests may consist of stands that are less complex and closer to an even-aged structure, with less variability in canopy layers, tree sizes, and forest gaps, while others may reflect mixed-severity disturbances with complex canopies composed of veteran trees and/or several

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[23] Veteran trees can occur in simple stands with an even-aged main canopy or complex stands with an uneven-aged main canopy (e.g., many Douglas-fir stands in the dry belt); multi-layered stands generally consist of old forests where canopy gap dynamics have led to multi-aged forests.

[24] For example, Land Management Handbook 72 for the Great Bear Rainforest provides separate thresholds for older (> 140 years old) stands (> 15 sph) and younger (> 80 years old) stands (25 sph) where veteran trees are greater than 50 cm dbh on drier sites and > 70 cm dbh on wetter sites (see Figure 11 on page 27 in Banner, A., D. Meidinger, R.N. Green, and S.C. Saunders. 2019. Guidelines to support implementation of the Great Bear Rainforest Order with respect to Old Forest and Listed Plant Communities. Prov. B.C., Victoria, B.C. Land Manag. Handb. 72.). These values are not applicable in all ecosystems in British Columbia, and work is underway to provide guidance for other areas.

[25] Note that the focus is on stand-*initiating* disturbances, and it is known that severity of disturbances in these ecosystems is highly variable.

distinct cohorts in the canopy. Large snags and logs may be less abundant or absent, or they may occur with a range of sizes and decay classes. Old forests in these stands often have trees with some unique morphological characteristics (e.g., timber defects), including cavities, forks, dead or broken tops, scars, or conks. Veteran trees are often an important component of old forest structure in these ecosystems and are most common in BEC subzones/variants where Douglas-fir, western larch, or ponderosa pine occur. Less commonly, veteran trees are lodgepole pine, western redcedar, interior spruce, or other less fire-tolerant species.

OLD FORESTS IN ECOSYSTEMS WITH STAND MAINTAINING DISTURBANCES – NDT 4

Historically, British Columbia's driest ecosystems experienced frequent stand-maintaining fires. This includes dry-belt fir forests in the IDF, as well as forests in the BG, PP, and driest subzones/variants of the ICH. Widely spaced, large trees with multiple fires scars were common in forests in these areas, although a range of forest conditions also occur, including moist riparian areas and portions of landscapes where mixed-severity fires were more common. In current landscapes, old forests are rare across most of these ecosystems due to historical human settlement and targeted removal of large trees in the early to mid-1900s. With suppression of fire and removal of First Nations burning practices, forest ingrowth has occurred across much of the area. In these ecosystems, evaluating ancient, old, and older mature forests is most reliable when it emphasizes the abundance of large, old veteran trees.

LANDSCAPE CONSIDERATIONS FOR OLD FORESTS

The priority deferral analysis has focused on stand-level attributes using Provincial Forest inventory data. However, for long-term conservation goals, landscape-level attributes are also critical. This includes ensuring maintenance of a range of patch sizes, including large and very large patches and prioritizing areas that have interior habitat (free of edge habitat). Connectivity among patches and between old forest and other forested and non-forested habitats is also important for maintaining biodiversity across landscapes.

Natural disturbance is part of the ongoing development and persistence of old forests. Much like fires can maintain open-forest structure, insects and pathogens are important agents in creating forest gaps in ecosystems where there are longer timeframes between stand-initiating disturbances.

APPENDIX 2. THE USE OF BIOGEOCLIMATIC ECOSYSTEM CLASSIFICATION IN IDENTIFYING PRIORITY OLD FOREST DEFERRALS

The BEC system uses a hierarchical approach to identify ecosystems in British Columbia from broad (zone) to regional (subzone/variant) and stand (site series) levels. Age-based definitions for seral stages, including ancient, old, older mature, mature, mid-seral, and early seral forests are described for BEC subzones/variants, as are estimates of average historical stand-initiating disturbance intervals and expected natural amounts of old forest. Appendix 4 of the Biodiversity Guidebook provides for more information on estimating natural seral stage distributions. Note that more recent updates were used in the deferral analysis (see TAP Old Growth Deferral: Technical Appendices final report).

Deferral analyses are based on BEC version 12 (BECv12), which integrates the most recent updates to biogeoclimatic mapping in British Columbia. BECv12 was published in September 2021 and is the default in iMap and the BC Data Warehouse.[26]

The BECv12 spatial data provide the most current provincial-scale delineation of ecosystems at the zone, subzone, variant, and phase scales and are the official source of NDT assignments for each BEC subzone/variant.

BEC mapping is completed at strategic scales. It is generally modelled using a 1:20,000 TRIM base, although some areas of the province still rely on mapping at coarser scales. Where there are inconsistencies between BEC subzones/variants on maps and on the ground, forest professionals are strongly encouraged to document the indicators that suggest a difference. This includes collection of site, soil, and vegetation data, along with geographic site coordinates, consistent with, at minimum, the Site Visit (SIVI) Form from Land Management Handbook 25: Describing Terrestrial Ecosystems in the Field[27] or the Silvicultural Prescription Plot Card (FS 39A) from Land Management Handbook 47: the Silvicultural Prescription Data Collection Handbook,[28] and a brief rationale as to the distinguishing features that support the changed BEC subzone/variant assignment using the appropriate Regional Field Guide.[29] The provincial Research Ecology Program suggests that any changes that deviate from the mapped BEC line by > 50 m in elevation difference or > 1 km in subdued (plateau) terrain be communicated to the appropriate regional Research Ecologist for consideration and review re: potential mapping updates.

Note that Land Use Orders may use different versions of BEC for implementation. This includes older versions of BEC in many areas of the province as well as draft versions of future BEC changes in the Great Bear Rainforest. Deferrals are not part of Land Use Order implementation, and the deferral analysis based on BECv12 is intentional, and evaluation of priority deferral criteria should be based on BECv12.

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[26] The data layer is called WHSE_FOREST_VEGETATION.BEC_BIOGEOCLIMATIC_POLY and can be downloaded at https://catalogue.data.gov.bc.ca/dataset/f358a53b-ffde-4830-a325-a5a03ff672c3.

[27] Available for download at https://www.for.gov.bc.ca/hfd/pubs/docs/Lmh/Lmh25/Lmh25_2015.pdf.

[28] Available for download at https://www.for.gov.bc.ca/hfd/pubs/docs/lmh/lmh47.htm.

[29] See BECweb to download the most current BEC field guide: https://www.for.gov.bc.ca/hre/becweb/resources/classificationreports/regional/index.html.

Appendix 3. Ground Sampling Procedures for Woodlots, Community Forest Agreements, and Other Operators Where Cruise Data Are Not Required for Appraisals

Some tenure holders, including Woodlot Licenses and Community Forests, are not required to collect cruise data for stumpage purposes as they utilize tabular rates consistent with the interior and coastal appraisal manuals. These tenure holders are not expected to collect cruise level data in addition to their standard practices.

This appendix is not applicable to BCTS, forest license holders, or tree farm license holders who are required to collect cruise data for appraisal purposes.

Where old growth deferrals are supported by First Nations, the best practice is for the tenure holder to identify all stands meeting the relevant priority old forest criteria prior to submitting Cutting Permits or proceeding with harvesting. Step 3 describes how to stratify cut blocks to Forest Type and Step 1 outlines the use of reconnaissance surveys, which may include remote sensing data (e.g., LiDAR or aerial imagery) and/or professional knowledge of the land base to determine whether priority deferral criteria are likely to be met in a cut block (or stratified Forest Type). As with other tenure holders, no additional data collection is required where a qualified professional recognizes that a cut block (or Forest Type) will meet priority deferral criteria, and a professional rationale is sufficient (as per Step 1).

Where a tenure holder wishes to proceed with harvesting in an area mapped as a priority deferral (see footnote 6), additional data collection is recommended to support harvesting decisions where forest inventory data are incorrect, and stands do not meet priority deferral criteria.

The best practice for those tenure holders who choose to collect cruise plot (or similar) data during their routine operations is to follow the methods for calculating metrics for assessing deferral criteria described in Step 4 (using the cruise or similar plots that are routinely collected), and includes collection of merchantable diameter and height data, and tree core ages. Where cruise plot (or similar) data are not routinely collected, tenure holders are encouraged to establish measurement plots that are representative of stand conditions within cut blocks and/or Forest Types.

APPENDIX 4. BEST PRACTICES FOR CORING AND AGING TREES TO DETERMINE STAND AGE

This appendix provides guidance for detailed methods on collecting tree ages from old forests, including information on:

- Which trees to core
- How to record tree age measurements
- How to estimate ages from incomplete cores due to internal decal
- How to estimate age to breast height in older stands
- How to determine final tree and stand ages.

A spreadsheet has been developed to accompany the instructions provided here and to calculate tree ages using the formulas and methods described here:

TreeAgeCalculationForDeferralAssessment_Appendix4.xlsx

Suggested equipment

- Increment borer that is long enough to reach the centre of trees that are "large" for the ecosystem you are working in.
- Plastic straws with a diameter wide enough to fit samples from your increment corer.
- Masking tape to seal the ends and write tree ID labels on.
- Sharpie or ballpoint pen to write on tape on straws.
- Map tube or PVC equivalent for carrying straws; note that a thick, plastic bag is often more efficient, particularly in wet climates.

SELECTING TREES TO AGE CORE

The goal of coring trees to assess deferral criteria is to estimate the time since the last stand-initiating disturbance, i.e., the largest/oldest trees.

For each potential deferral Forest Type (e.g., BEC subzone/variant and stand structural condition):

- Collect age cores from a minimum of the five (5) largest diameter living trees in the cruise plots for each Forest Type assessed.

The veteran tree layer must be sampled separately in ecosystems where older mature forests are included in deferrals and where there are > 20 sph in the veteran layer (see Table A6.1).

- The veteran tree layer includes trees that survived the last stand-replacing disturbance (veteran tree layers are defined in Appendix 1).
- Collect age cores from a minimum of two (2) veteran trees in addition to the trees cored from the main canopy (described above).
    - Core the largest diameter trees in the veteran layer.
    - Where a veteran tree layer with > 20 sph occurs, a minimum of seven (7) trees will be cored (five from the main canopy and two from the veteran layer).

COLLECTING TREE CORE SAMPLES

- Trees should be cored at breast height (BH), which is defined as 1.3 m above the high side ground (HSG). HSG is the highest point of mineral soil or a humus layer around the base of the tree and no lower than the point of germination (as per the Cruising Manual)
- Drill trees perpendicular to the direction of the pith.
- The process for determining how to core trees with complex growth forms is outlined in Section 4.3.2.5 of the Cruising Manual and in the VRI Ground Sampling Procedures (2018).
- Record the height of the tree core extraction and the diameter at the extraction height if the tree is cored at a height that differs from BH when it is not possible to core trees at BH because of obstructions or complex growth forms.

DETERMINING TREE AGE FROM TREE CORES TO ESTIMATE STAND AGE[30]

1. <u>Core the tree and assess core quality</u>
   a. Take an age core from the tree at the location determined above (i.e., ideally at BH, but moved a minimum amount if necessary). Attempt to include pith for every core.
   b. If the age core is solid but pith was missed by a wide margin, age core the tree again, attempting to get closer to pith. Continue to re-drill the tree until pith is obtained in a solid age core, or the rings indicate you are within ≤ 5 years from pith.[31]
      i. If pith was obtained, record <u>PTH</u> (‘pith’) for the **measurement code**.[32]
      ii. If pith was not obtained, record <u>NOP</u> (‘no pith’) for the measurement code.
   c. When the tree is too large in diameter to allow your increment borer to reach the center, take the longest age core you can, and record <u>CRC</u> (‘cannot reach center’) for the measure code.
      i. For old growth forests, a longer than normal increment borer will be required, and field practitioners are expected to be provided with an increment borer that will reach the centre of trees that are “typical” for the largest/oldest trees in the ecosystem they are working in.
   d. When the age core is rotten towards the center of the tree, take the best or longest solid core you can, and record <u>ROT</u> (‘rotten age core’) for the measurement code.

2. <u>Count the age core in the field</u>

- In all measure codes described above, record the number of growth rings physically present on the age core in the **field count**.
- For NOP (No Pith) age cores, additionally record your **estimated years to pith**. Estimates of years missing to pith require sufficient visible curvature on the age core to estimate the number of rings to pith. This can be done using overlays of concentric rings that rely on the ring pattern in the age core. The ring count plus the missed years to pith equal BH age.

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[30] The procedures here are summarised from the VRI Ground Sampling Procedures (2018) and may differ slightly from those in the Cruising Manual. This is because of different objectives for collecting tree ages between Cruising and Forest Inventory.

[31] Overlays of concentric rings can be used to estimate the distance to pith (when relatively close) using the pattern of rings.

[32] Measure code can be recorded in the spreadsheet (TreeAgeCalculationForDeferralAssessment_Appendix4.xlsx) and used in summary data for professional rationales (see Appendix 7).

- For CRC (Cannot Reach Centre) and ROT (Rotten) age cores, additionally measure the length of the present/solid/countable portion of the age core (in centimetres, to the nearest decimal, excluding any attached bark/cambium) and record that in **core length**. A calculation will be done to estimate the missing portion of the age core based on the rings/cm, recorded diameter, and database-estimated bark thickness.
- Where tree rings are too close together to accurately count in the field, or where ages are very close to applicable thresholds for a deferral category, collect age cores in plastic straws for counting in the office.

3. Count the age core in the office

- Where office-based counting is required, each collected age core should be counted under a microscope for a more accurate age count. This age is recorded as the **office count**.
- The office age count should only count physically present rings. It should not include the value of the missed years to pith from NOP age cores, nor the calculated missing rings from CRC or ROT age cores.
- There are many ways to aid in an accurate office count, but one primary method is to shave the top of the age core with a razor blade to expose very clear growth rings. Slightly moistening age cores can also help to enhance contrast between early and late wood.

DETERMINE THE TOTAL TREE AGE

- The **office age** is the
  - estimated total tree core age; and
  - an estimate of years to grow to breast height.
- Determine office age by adding the BH age (see below) to ring counts or estimates that vary by the age core measurement code:
  - **PTH age cores** (pith included): use the full ring count from the age cores
  - **NOP age cores** (age cores estimated to be within ~5 years of pith): use full age core ring count plus number of estimated rings
  - **CRC or ROT age cores** (incomplete age cores): estimate the missing rings using the linear extrapolation method:
    - *Office age = ring count + missing ring estimate*
    - *Where:*
      - Missing ring estimate = avg rings ÷ cm × missing age core length
      - Avg rings/cm = ring count ÷ intact age core length
      - Length of missing age core = [(DBH x double bark thickness ratio) ÷ 2] – intact age core length
        - Double bark thickness ratios are derived from database values and are provided in Table A4.1.
    - This process is easily calculated in the spreadsheet that accompanies this appendix: **TreeAgeCalculationForDeferralAssessment_Appendix4.xlsx**

Table A4.1 Double bark thickness ratios[33]

Group	Double-bark thickness ratio
Thick-bark species – Fd, Lw, Py, Hw	0.890
Thin-bark species – Cw, Pl, Pw, B, S	0.968

GROWTH TO BREAST HEIGHT

The estimated age to breast height accounts for the time required for the tree to grow from establishment to breast height. Use the following estimates:

- For faster growing species including Fd, Lw, Pl, Pw, Py = add 10 years;
- For more shade tolerant and slower growing species including Hw, Cw, Se, Sx, Ss, Bl, Ba, Bg add 15 years to the age core count to determine total tree age.

The approach to estimating breast height age provided here differs from the methods outlined in the Cruise Manual (site index curves) or the VRI data compilation procedures (Site Tools) because those methods rely on Site Index calculations which are not considered reliable for forests > 120 years old.

Note that larger trees are also expected to have more complex growth histories, and thus higher rates of error.

FINAL TREE AGE

The final tree age is the **sum of the office age** and the **growth to breast height**, and it is based on either the field age (field count + estimated years to pith) for PTH and NOP age cores or the office age (office count + estimated missing years to pith) for CRC or ROT age cores.

STAND AGE FOR COMPARISONS TO PRIORITY OLD FOREST DEFERRAL CRITERIA

The final age of the stand (cut block or Forest Type) is the average age of the five largest/oldest trees age cored in the main canopy (excluding veteran trees), where tree ages include growth to breast height. The stand age should be compared to ages listed in the deferral criteria for each Forest Type being evaluated (see Table A6.1 in Appendix 6).

Ages for veteran trees are used to confirm veteran status in the Priority Deferral Decision Flowchart in Step 2 of this document and apply in ecosystems where Older Mature Forests are identified in deferrals (see part 6(a)).

TIPS FOR SUCCESSFUL TREE CORES IN OLD FORESTS:

Longer increment borers are generally required for assessing ages in old forests. These are increasingly fragile, and the following tips and suggestions are offered to reduce damage and frustration.

If the increment borer handle is difficult to turn when nearly fully inserted in a large tree, try switching to a shorter increment borer handle to complete the age core and reach the inner most rings (assuming you have the same brand of increment borer). This is especially helpful for trees with butt flare since a shorter handle covers a smaller radius.

[33] Based on average bark thickness ratios (DIB/DOB) from Kozak's taper model (2002).

To avoid compressing age cores within the shaft while an age core is being taken, try removing the age core in sections – drill approximately 20 cm into the tree, place the sample in a straw, then continue to take the remainder of the age core, removing sections every ~5 cm. Compressed age cores are "mashed together" and are not possible to count. They also jam an increment borer.

When extracting age cores from a long increment borer, try wrapping a shoelace around the end of the extractor/spoon and using it to pull straight back. This will reduce the risk of bending the end of the extractor.

Clean the inside of the shaft with a small amount of very fine steel wool sprayed with WD40 or Teflon spray lube that is wrapped around the end of the extractor (on the "teeth"). This will reduce the chance of jamming the increment borer. Cleaning is especially important for trees with lots of sap but should be done daily. An aluminum cleaning kit for a .22 caliber rifle also works well.

Wooden golf tees are also very helpful for removing small pieces of age core that may get stuck at the end of the shaft. Never insert a metal item into the bit; the sharp portion of an increment borer bit is very thin and short and is easily damaged.

When the pith is missed, try again. When removing the age core sample, always do a full rotation and make sure to take note of which way the inner rings are curved when "cracking" the increment borer. This will show the direction and approximate distance from your first attempt to the pith. Unwind the increment borer, place the extractor in the first hole, align the increment borer with the extractor only until it is securely in the tree, then remove the extractor and place it in a safe spot. Do not leave the extractor in the tree longer than required to get a "good bite" because any error in alignment with the subsequent attempt has the potential to have the bit hit the extractor. This will destroy the increment borer.

APPENDIX 5. PROFESSIONAL RATIONALES

The Association of British Columbia Professional Foresters (ABCFP) has developed guidance to support forest professionals in developing professional rationales. The Guidelines for Interpretation of the Code of Ethical and Professional Conduct can be downloaded at https://abcfp.ca/web/ABCFP/Governance/Code-of-Ethical-and-Professional-Conduct.aspx

The following example (see next page) is intended to provide guidance and expectations for professionals evaluating candidate deferral areas using the processes outlined in this document. The cut blocks shown in this section are used as examples and contain information that does not reflect actual cut block characteristics.

The following cruising products are helpful to include as appendices to professional rationales for priority deferral decisions:

- Cruise map with plot numbers
- Cruise compilation, including plot cards showing tree selection for aging
- Cutting Permit Access map

SAMPLE DETERMINATION AND RATIONALE – A PROPOSED BLOCK DEPICTING THE ‘DELETION’ OF A PRIORITY OLD FOREST DEFERRAL AREA AND THE REQUIRED IDENTIFICATION OF A ‘REPLACEMENT’ PRIORITY OLD FOREST DEFERRAL AREA

Licensee XYZ

Cutting Permit ABC123-B12

Priority Old Forest Deferral Area Field Verification Summary & Rationale

DATE

INTRODUCTION

This summary/rationale documents the results of the Priority Old Forest Deferral Area field verification process undertaken for CP ABC123 Block 12, as well as the subsequent decision-making to defer harvesting in Forest Type 1 and propose harvesting in Forest Type 2 within CP ABC123-B12.

BACKGROUND

- Proposed CP ABC123 Block 12 is located within the MHmm1 BEC zone in Landscape Unit EFG.
- The proposed block is entirely within the big-treed priority deferral area.
- Deferral criteria, as listed in Table A6.1 in *Priority Field Verification of Old Forest Deferral Areas: Technical Guidance v3.1* (“the field verification guidance”) are shown in Table A5.1.

Table A5.1 Deferral criteria for the MHmm1

BEC subzone / variant	NDT	Ancient Age (>)	Old Age (>)	Older Mature Age (>)	Remnant Old Ecosystems	Old Min Height	Old Min QMD	Older Mature Min Height	Older Mature Min QMD
MHmm1	NDT1	400	250	200	-	36	44	-	-

PROCEDURES & RESULTS

Assess the extent and likelihood of proposed harvest blocks overlapping with Priority Deferral Criteria

- CP 123ABC-B12 is completely within a polygon mapped as a priority big-treed deferral.
- The proposed block is mapped as a priority old forest deferral area but may not meet the deferral criteria and become available for harvest

Determination:

While the block is identified in the priority old forest deferral mapping, reconnaissance level field work indicated that field verification was necessary to assess the eastern portion of the block to determine if it meets the Big-treed priority deferral criteria.

Stratify the Stand Based on Ecosystem and Stand Structural Conditions

- The proposed block was divided into two Forest Types.
- The VRI polygons closely mirrored the two Forest Types and were used for stratification.
- Forest Type 1 (NW portion of the block) contains larger trees with more complex old forest stand structure than Forest Type 2, even though both types are mapped as a priority deferral areas.

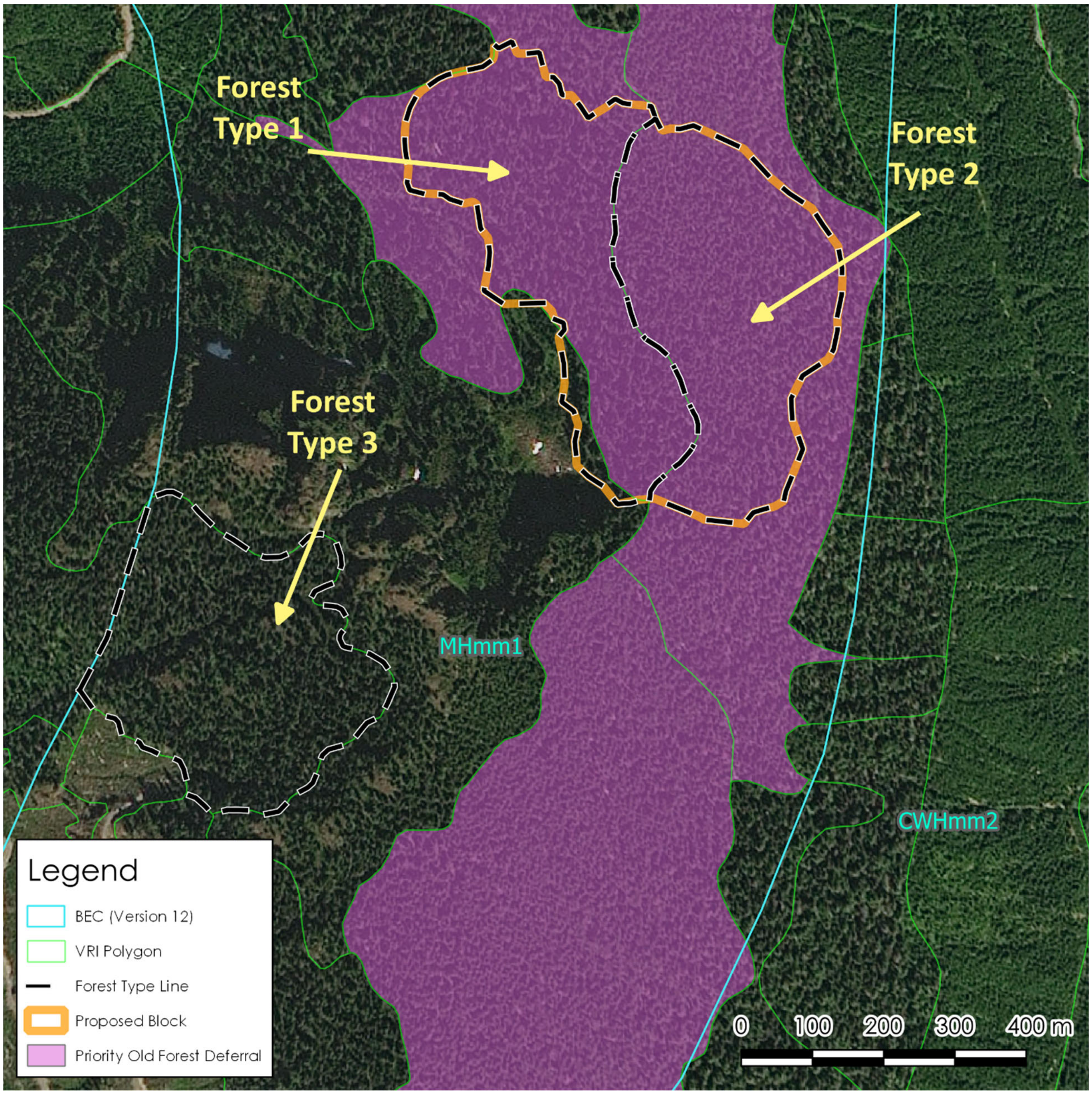

Figure A5.1. Map of CP ABC123-B12 ecological stratification.

Determination:

Old forest deferral criteria were assessed for the two separate Forest Types within the block, and deferral decisions are based on data from each of those Types.

Collect and Compile Field Data

- CP ABC123 Block 12 was developed and cruised prior to the province's priority deferral announcement.
- The full cruise plan can be found in Appendix X[34] of this submission. Figure A5.1b shows the distribution of cruise plots within each Forest Type in the block. Supplementary field plot locations are identified for Forest Type 3
- Cruise data were overlayed on the Forest Types and a cruise compilation was run for each Type (Figure A5.2).

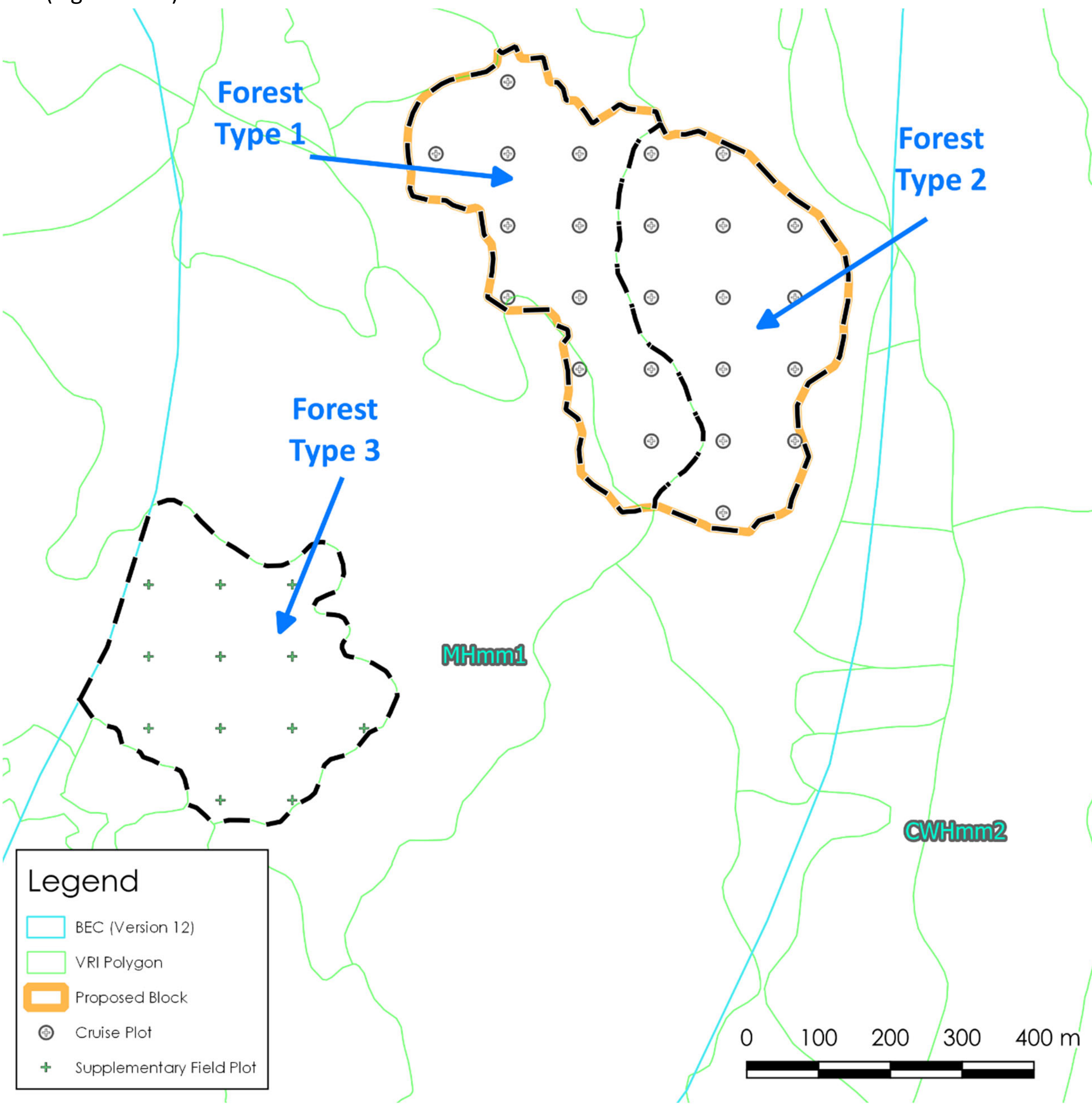

Figure A5.2. Cruise plot distribution, by Forest Type.

[34] Not included in this example rationale.

- Field crews collected additional tree core data as per procedures outlined in the field verification guidance document.
- Table A5.2 summarizes Age data for CP ABC123-B12. Ecological age for the Forest Types is shown in bold.

Table A5.2. Age Data for Block ABC123 B12.

Forest Type	Tree Species	Tree DBH	Measure Code	Tree Ring Count	Estimated Missing Rings	Breast Height Age	Yrs to Breast Height	Tree Age
1	Hm	97.4	ROT	243	87	330	15	345
	Hm	85.3	NOP	368	5	373	15	388
	Hm	88.2	NOP	317	4	321	15	336
	Hm	83.6	ROT	210	95	305	15	320
	Ba	77.2	ROT	187	110	297	15	312
	Mean Age							**340**
2	Hm	52.2	NOP	373	4	377	15	392
	Hm	37.3	ROT	199	89	288	15	302
	Ba	39.2	ROT	201	124	325	15	340
	Ba	45.4	ROT	245	50	295	15	310
	Ba	58.5	PTH	330	0	330	15	345
	Mean Age							**338**

Determination:

Methods and procedures outlined in the field verification guidance were followed. The Stand ages, QMD's, and heights are shown in Table A5.3 for each Forest Type.

Refer to Appendix Y[35] of this submission for cruise compilation, candidate tree selection for aging, and tree core field cards.

DETERMINE IF PRIORITY DEFERRAL CRITERIA ARE MET

The Priority Deferral Decision Flowchart from the field verification guidance (Step 2) was followed to determine whether each of the Forest Types met priority deferral criteria for Ancient, Remnant Old Ecosystems, or Big-treed Old Growth. Table A5.1c summarizes the deferral criteria and data measured in

[35] Not included in this example rationale.

the field. Table A5.4 shows the relevant information, results, and processes from the Priority Deferral Decision Flowchart.

Table A5.3. Forest Type Age, QMD, and Height Summary

Forest Type	Stand Age	QMD (cm)	Height (m)
1	340	73.3	36.1
2	338	42.4	30.9
3	340	65	38
DEFERRAL CRITERIA	> 250 (old) > 400 (ancient)	≥ 44 cm	≥ 36 m

Table A5.4. Priority Deferral Decision Flowchart Results

1 Stand Age*

Old Forest	Yes →	Go to 2: Review Remnant Old Ecosystem criteria	Types have ages > 250 and < 400

2 Remnant Old Ecosystem*

	No →	Go to 4: Big-treed Old Growth Criteria for Old Forests	No– the MHmm1 is not identified as a Remnant Old Ecosystem

4 Big-treed Criteria for Old Forest

Mapped as Priority Deferral (See footnote 6)	Yes →	Go to 4(a): Comparing Big-treed Criteria for stands *mapped* as Priority Deferrals	Type 1 and 2 are mapped as a Priority Deferral Area

4(a) Big-treed Criteria for stands *mapped* as Old Forest Priority Deferrals*

Field-measured QMD and Stand Height are *both less than* values for Old Forests in Table A6.1	Yes →	Type 1 meets deferral criteria Type 2 does not meet deferral criteria	Harvesting is proposed in Type 2

4(b) Big-treed Criteria for stands *not mapped* as Old Forest Priority Deferrals*

Field-measured QMD and Stand Height are *both greater than or equal to* values for Old Forests provided in Table A6.1	Yes →	Type 3 Meets deferral criteria	Type 3 is recommended as replacement area

Documenting Field Evaluations and Submitting Spatial Data

Spatial data are submitted as per the Old Growth Field Observation Form. The required pdf map is shown on the Old Growth Deferral Field Verification Map (Figure A5.3).

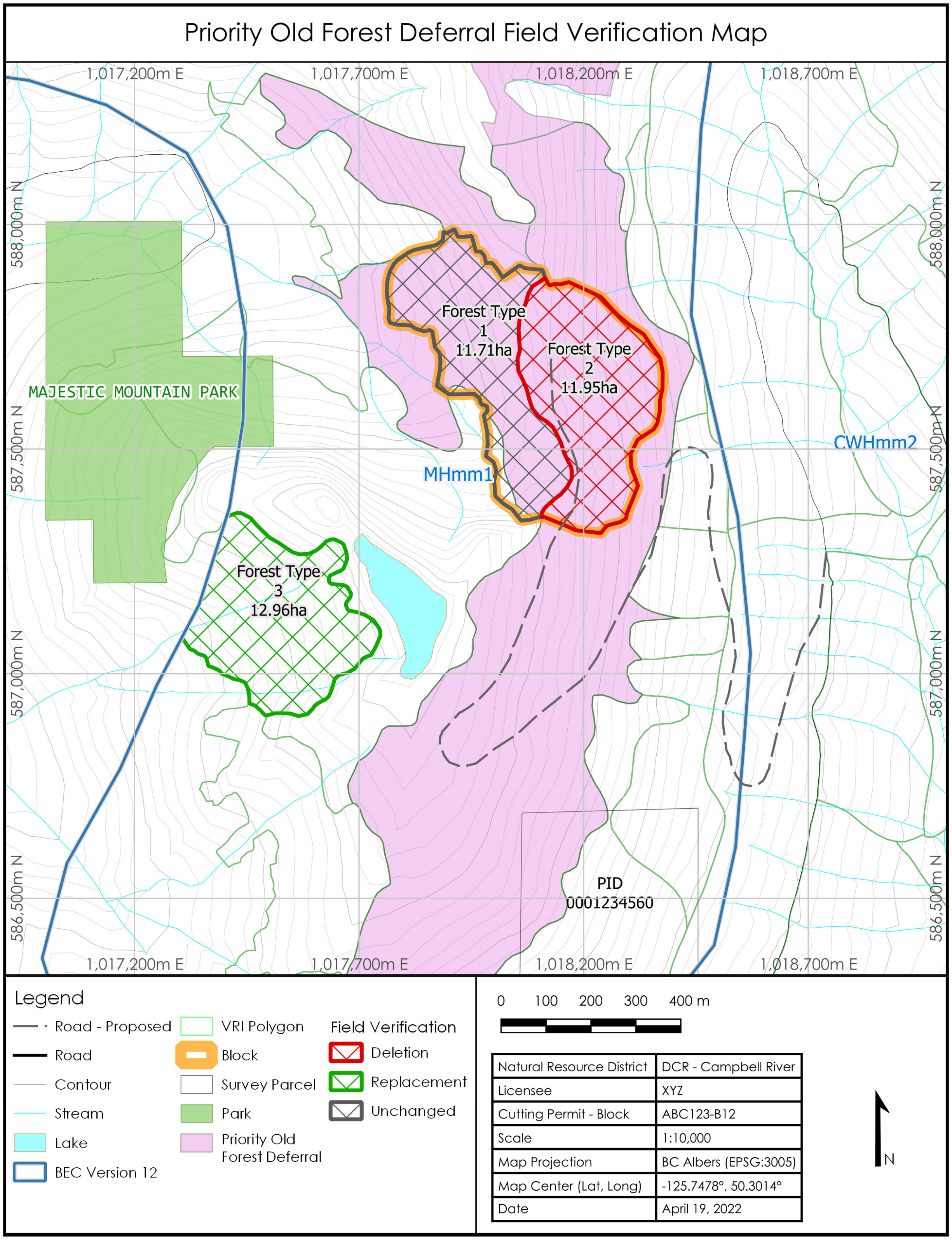

Figure A5.3. PDF map showing post-field verification deferral areas.

Conclusion

I have determined that the process undertaken by Licensee XYZ for CP ABC123-B12 is consistent with the field verification procedures detailed in the *Field Verification of Priority Old Forest Deferral Areas: Technical Guidance, Version 3.1.*

Forest Type 1 was mapped as a Priority Old Forest Deferral Area and meets the priority deferral criteria and is identified as a deferral area in the Cutting Permit submission. Forest Type 2 was mapped as a Priority Old Forest Deferral Area, but, although the stand exceeds the minimum age for old forest, neither the QMD or height exceed the minimum values for the MHmm1, and harvesting is proposed. Forest Type 2 is identified as a DELETION in the data submission. Forest Type 3 was not mapped as a Priority Old Forest Deferral Area, and the minimum age for old forest, QMD and height exceed the minimum values for the MHmm1. Forest Type 3 is proposed as a Replacement Priority Old Forest Deferral Area for the deletion of Forest Type 2.

This assessment does not supersede any requirements in land use orders, higher level plan orders, government action regulations (GAR), or any other legislation, guidance, or best practices. Supporting mapping and spatial data are attached to this document.

<table>
<tr><th>RPF Printed Name</th><th>RPF’s Signature & Seal</th></tr>
<tr><td></td><td rowspan="4"></td></tr>
<tr><th>Date Signed</th></tr>
<tr><td></td></tr>
<tr><td>I certify that the work described herein fulfills the standards expected of a registrant of the Association of British Columbia Forest Professionals and that I did personally supervise the work.</td></tr>
</table>

APPENDIX 6. DATA FOR USE IN COMPARING FIELD METRICS TO DEFERRAL CRITERIA

The following tables provide the data for comparing field data to priority deferral criteria. Data should be used with the Priority Deferral Decision Flowchart in Step 2.

A value of "All" in Table A6.1 indicates that all forests in the specified age category in that BEC subzone/variant meet the criteria, regardless of tree size. For the Remnant Old Ecosystems column, a value of "Some LU" indicates that some BEC/LU combinations meet the criteria, regardless of tree size. BEC/LUs that meet the Remnant Old Ecosystems criteria are listed in Table A6.2.

Table A6.1. Summary of Priority Old Forest Criteria for Ancient, Remnant, and Big-treed Old Growth, by BEC subzone/variant.[a] Columns with a header shaded in grey refer to Big-treed Old Growth criteria[b]

BEC subzone/ variant	NDT	Ancient Age (>)	Old Age (>)	Older Mature Age (>)	Remnant Old Ecosystems	Old Min[c] Height	Old Min[c] QMD	Older Mature Min[c] Height	Older Mature Min[c] QMD
BGxh1	NDT4	400	250	200	All	All	All	All	All
BGxh2	NDT4	400	250	200	All	All	All	All	All
BGxh3	NDT4	400	250	200	All	All	All	All	All
BGxw1	NDT4	400	250	200	All	All	All	All	All
BGxw2	NDT4	400	250	200	All	All	All	17	20
BWBSdk	NDT3	250	140	120	Some LU	28	27	-	-
BWBSmk	NDT3	250	140	120	Some LU	-	-	-	-
BWBSmw	NDT3	250	140	120	Some LU	-	-	-	-
BWBSvk	NDT3	250	140	120	All	All	All	11	20
BWBSwk1	NDT3	250	140	120	Some LU	25	26	-	-
BWBSwk2	NDT3	250	140	120	Some LU	27	27	-	-
BWBSwk3	NDT3	250	140	120	Some LU	20	21	-	-
CDFmm	NDT2	400	250	200	All	All	All	All	All
CWHdm	NDT2	400	250	200	All	All	All	All	All
CWHds1	NDT2	400	250	200	Some LU	34	42	-	-
CWHds2	NDT2	400	250	200	Some LU	35	45	-	-
CWHmm1	NDT2	400	250	200	Some LU	37	48	-	-
CWHmm2	NDT2	400	250	200	Some LU	46	47	-	-
CWHms1	NDT2	400	250	200	Some LU	38	43	-	-
CWHms2	NDT2	400	250	200		38	56	-	-
CWHvh1	NDT1	400	250	200	Some LU	34	54	-	-
CWHvh2	NDT1	400	250	200		30	48	-	-
CWHvh3	NDT1	400	250	200	Some LU	35	46	-	-
CWHvm1	NDT1	400	250	200	Some LU	37	53	-	-
CWHvm2	NDT1	400	250	200	Some LU	38	47	-	-

BEC subzone/ variant	NDT	Ancient Age (>)	Old Age (>)	Older Mature Age (>)	Remnant Old Ecosystems	Old Min[c] Height	Old Min[c] QMD	Older Mature Min[c] Height	Older Mature Min[c] QMD
CWHwh1	NDT1	400	250	200		33	43	-	-
CWHwh2	NDT1	400	250	200		35	46	-	-
CWHwm	NDT1	400	250	200	Some LU	36	40	-	-
CWHws1	NDT2	400	250	200	Some LU	39	42	-	-
CWHws2	NDT2	400	250	200		37	44	-	-
CWHxm1	NDT2	400	250	200	All	All	All	All	All
CWHxm2	NDT2	400	250	200	All	All	All	20	25
ESSFdc1	NDT2	400	250	200	All	27	25	-	-
ESSFdc2	NDT3	250	140	120	Some LU	27	30	-	-
ESSFdc3	NDT3	250	140	120	Some LU	29	32	-	-
ESSFdh1	NDT3	250	140	120	Some LU	33	37	-	-
ESSFdh2	NDT3	250	140	120		31	35	-	-
ESSFdk1	NDT3	250	140	120	Some LU	24	26	-	-
ESSFdk2	NDT3	250	140	120	Some LU	28	29	-	-
ESSFdv1	NDT3	250	140	120		28	31	-	-
ESSFdv2	NDT3	250	140	120		23	33	-	-
ESSFmc	NDT2	400	250	200	All	26	29	-	-
ESSFmh	NDT2	400	250	200	All	All	All	28	28
ESSFmk	NDT2	400	250	200	Some LU	28	42	-	-
ESSFmm1	NDT2	400	250	200	Some LU	32	34	-	-
ESSFmm2	NDT2	400	250	200	Some LU	40	39	-	-
ESSFmm3	NDT2	400	250	200	All	34	42	-	-
ESSFmv1	NDT2	400	250	200	All	All	All	20	23
ESSFmv2	NDT2	400	250	200	All	All	All	25	29
ESSFmv3	NDT2	400	250	200	All	21	23	-	-
ESSFmv4	NDT2	400	250	200	All	All	All	23	25
ESSFmw	NDT2	400	250	200		23	30	-	-
ESSFmw1	NDT2	400	250	200	Some LU	35	43	-	-
ESSFmw2	NDT2	400	250	200	Some LU	32	39	-	-
ESSFun	NDT3	250	140	120	Some LU	27	31	-	-
ESSFvc	NDT1	400	250	200	Some LU	32	41	-	-
ESSFwc2	NDT1	400	250	200	Some LU	32	42	-	-
ESSFwc3	NDT1	400	250	200	All	22	25	-	-
ESSFwc4	NDT1	400	250	200	All	28	31	-	-
ESSFwh1	NDT1	400	250	200	Some LU	31	35	-	-
ESSFwh2	NDT2	400	250	200	All	31	35	-	-
ESSFwh3	NDT2	400	250	200	All	All	All	29	34

BEC subzone/ variant	NDT	Ancient Age (>)	Old Age (>)	Older Mature Age (>)	Remnant Old Ecosystems	Old Min[c] Height	Old Min[c] QMD	Older Mature Min[c] Height	Older Mature Min[c] QMD
ESSFwk1	NDT1	400	250	200	All	All	All	35	56
ESSFwk2	NDT1	400	250	200	All	26	29	-	-
ESSFwm1	NDT2	400	250	200	All	22	25	-	-
ESSFwm2	NDT1	400	250	200	All	16	21	-	-
ESSFwm3	NDT2	400	250	200	All	All	All	27	32
ESSFwm4	NDT2	400	250	200	All	All	All	23	28
ESSFwv	NDT1	400	250	200	Some LU	31	34	-	-
ESSFxc1	NDT3	250	140	120	-	24	27	-	-
ESSFxc2	NDT3	250	140	120	-	28	30	-	-
ESSFxc3	NDT3	250	140	120	Some LU	23	27	-	-
ESSFxv1	NDT2	400	250	200	All	14	17	-	-
ESSFxv2	NDT2	400	250	200	All	All	All	All	All
ICHdk	NDT3	250	140	120	-	35	37	-	-
ICHdm	NDT3	250	140	120	Some LU	28	33	-	-
ICHdw1	NDT3	250	140	120	Some LU	30	35	-	-
ICHdw3	NDT3	250	140	120	Some LU	32	36	-	-
ICHdw4	NDT3	250	140	120	-	31	36	-	-
ICHmc1	NDT2	400	250	200	Some LU	34	38	-	-
ICHmc2	NDT2	400	250	200	All	34	37	-	-
ICHmk1	NDT3	250	140	120	Some LU	32	31	-	-
ICHmk2	NDT3	250	140	120	Some LU	30	34	-	-
ICHmk3	NDT2	400	250	200	All	All	All	24	25
ICHmk4	NDT3	250	140	120	All	25	26	-	-
ICHmk5	NDT3	250	140	120	Some LU	30	31	-	-
ICHmm	NDT2	400	250	200	Some LU	32	35	-	-
ICHmw1	NDT2	400	250	200	All	All	All	31	42
ICHmw2	NDT2	400	250	200	All	All	All	24	26
ICHmw3	NDT2	400	250	200	All	All	All	35	52
ICHmw4	NDT2	400	250	200	All	All	All	All	All
ICHmw5	NDT2	400	250	200	All	All	All	All	All
ICHvc	NDT1	400	250	200	Some LU	32	35	-	-
ICHvk1	NDT1	400	250	200	-	33	41	-	-
ICHvk2	NDT1	400	250	200	Some LU	All	All	34	55
ICHwc	NDT2	400	250	200	Some LU	32	47	-	-
ICHwk1	NDT1	400	250	200	Some LU	31	37	-	-
ICHwk2	NDT1	400	250	200	Some LU	32	38	-	-
ICHwk3	NDT1	400	250	200	Some LU	30	33	-	-

BEC subzone/ variant	NDT	Ancient Age (>)	Old Age (>)	Older Mature Age (>)	Remnant Old Ecosystems	Old Min[c] Height	Old Min[c] QMD	Older Mature Min[c] Height	Older Mature Min[c] QMD
ICHwk4	NDT1	400	250	200	Some LU	All	All	37	57
ICHxm1	NDT4	400	250	200	All	All	All	All	All
ICHxw	NDT4	400	250	200	All	All	All	All	All
IDFdc	NDT4	400	250	200	All	All	All	28	33
IDFdh	NDT4	400	250	200	All	All	All	All	All
IDFdk1	NDT4	400	250	200	All	All	All	All	All
IDFdk2	NDT4	400	250	200	All	All	All	All	All
IDFdk3	NDT4	400	250	200	All	All	All	All	All
IDFdk4	NDT4	400	250	200	All	All	All	All	All
IDFdk5	NDT4	400	250	200	All	All	All	All	All
IDFdm1	NDT4	400	250	200	All	All	All	20	22
IDFdm2	NDT4	400	250	200	All	All	All	All	All
IDFdw	NDT4	400	250	200	Some LU	23	28	-	-
IDFmw2	NDT4	400	250	200	All	All	All	All	All
IDFww	NDT4	400	250	200	Some LU	25	29	-	-
IDFww1	NDT4	400	250	200	-	25	32	-	-
IDFxc	NDT4	400	250	200	All	All	All	26	34
IDFxh1	NDT4	400	250	200	All	All	All	22	28
IDFxh2	NDT4	400	250	200	All	All	All	17	26
IDFxk	NDT4	400	250	200	All	All	All	All	All
IDFxm	NDT4	400	250	200	All	All	All	All	All
IDFxw	NDT4	400	250	200	All	All	All	18	24
IDFxx1	NDT4	400	250	200	-	All	All	All	All
IDFxx2	NDT4	400	250	200	All	All	All	All	All
MHmm1	NDT1	400	250	200	-	36	44	-	-
MHmm2	NDT1	400	250	200	Some LU	33	42	-	-
MHwh	NDT1	400	250	200	-	33	43	-	-
MHwh1	NDT1	400	250	200	-	29	39	-	-
MSdc1	NDT3	250	140	120	-	29	34	-	-
MSdc2	NDT3	250	140	120	Some LU	23	26	-	-
MSdc3	NDT3	250	140	120	-	25	35	-	-
MSdk	NDT3	250	140	120	Some LU	29	28	-	-
MSdm1	NDT3	250	140	120	Some LU	24	24	-	-
MSdm2	NDT3	250	140	120	Some LU	24	28	-	-
MSdm3	NDT3	250	140	120	Some LU	27	28	-	-
MSdv	NDT3	250	140	120	Some LU	24	21	-	-
MSdw	NDT3	250	140	120	Some LU	21	22	-	-

BEC subzone/ variant	NDT	Ancient Age (>)	Old Age (>)	Older Mature Age (>)	Remnant Old Ecosystems	Old Min[c] Height	Old Min[c] QMD	Older Mature Min[c] Height	Older Mature Min[c] QMD
MSxk1	NDT3	250	140	120	Some LU	23	26	-	-
MSxk2	NDT3	250	140	120	Some LU	24	27	-	-
MSxk3	NDT3	250	140	120	Some LU	24	27	-	-
MSxv	NDT3	250	140	120	Some LU	15	17	-	-
PPxh1	NDT4	400	250	200	All	All	All	24	27
PPxh2	NDT4	400	250	200	All	All	All	18	30
SBPSdc	NDT3	250	140	120	All	All	All	All	All
SBPSmc	NDT3	250	140	120	Some LU	26	23	-	-
SBPSmk	NDT3	250	140	120	All	All	All	19	20
SBPSxc	NDT3	250	140	120	All	11	14	18	20
SBSdh1	NDT3	250	140	120	-	29	28	-	-
SBSdh2	NDT3	250	140	120	-	29	32	-	-
SBSdk	NDT3	250	140	120	Some LU	20	21	-	-
SBSdw1	NDT3	250	140	120	Some LU	30	32	-	-
SBSdw2	NDT3	250	140	120	Some LU	21	23	-	-
SBSdw3	NDT3	250	140	120	All	13	18	-	-
SBSmc1	NDT3	250	140	120	Some LU	26	26	-	-
SBSmc2	NDT3	250	140	120	Some LU	27	31	-	-
SBSmc3	NDT3	250	140	120	All	15	18	-	-
SBSmh	NDT3	250	140	120	-	35	36	-	-
SBSmk1	NDT3	250	140	120	Some LU	26	27	-	-
SBSmk2	NDT3	250	140	120	Some LU	27	27	-	-
SBSmm	NDT3	250	140	120	Some LU	29	32	-	-
SBSmw	NDT3	250	140	120	Some LU	27	23	-	-
SBSun	NDT3	250	140	120	Some LU	26	29	-	-
SBSvk	NDT2	400	250	200	All	All	All	32	39
SBSwk1	NDT2	400	250	200	All	All	All	All	All
SBSwk2	NDT2	400	250	200	All	All	All	20	21
SBSwk3	NDT3	250	140	120	-	28	34	-	-

[a] "All" means that all stands meeting the minimum ages for Old Forest or Older Mature Forest (as applicable) meet the priority deferral criteria. Refer to Table A6.2 where "Some LU" is specified for Remnant Old Ecosystems.

[b] Minimum (min) values reflect the compiled (averaged) QMD and stand height from all merchantable trees sampled in plots within a Forest (e.g., Timber) Type compilation.

[c] Big-treed criteria apply to all old (or older) mature stands in a BEC subzone/variant, whether mapped as such in the current view of the Priority Old Forest Deferral Areas map.

Table A6.2. BEC/LUs identified as Remnant Old Ecosystems

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
BWBSdk	Atlin Lake		45
	Barrington River		230
	Braid		1491
	Chukachida River		227
	Gladys River		468
	Inklin River		597
	Jennings River		611
	Kakiddi Creek		630
	Klappan River		682
	Kusawa River		712
	Kwadacha Addition		2207
	Mess Creek		850
	Middle Stikine River		862
	Nahline River		909
	Nakina River		914
	Pitman River		1029
	Sheslay River		1133
	Spatsizi River		1195
	Stikine River		1214
	Swift River		1239
	Tahltan River		1244
	Tatshenshini River		1256
	Teslin River		1268
	Tutshi River		1324
	Tuya River		1326
	Upper Iskut River		1352
	Upper Stikine River		1380
BWBS mk	Blueberry		1486
	Churchill	11	2253
	Dease-Liard		2237
	Gathto	14	1570
	Kahntah		1618
	Kotcho	29	2268
BWBSmk (cont'd)	Major Hart	5	1662
	Muncho	10	1685
	Petitot	28	2277
	Prophet	15	2248
	Shekilie	30	1756
	Sikanni		1757
BWBS mw	Dawson Creek		1525
	Kiskatinaw		1624
	Lower Beatton		1655
	Lower Moberly		1656
	Milligan		1672
	One Island		1707
	Redwillow		1741
	Schooler		1748
	Selwyn		1750
	Septimus		1754
	Tommy Lakes		1792
BWBS wk1	Gwillim		1586
	Kinuseo		1623
	Kiskatinaw		1624
	Narraway		1691
	Puggins		1733
	Redwillow		1741
	Upper Moberly		1802
	Wapiti		1808
BWBS wk2	Hudson's Hope		1600
BWBS wk3	Hyland	17	2270
	Klua	24	1633
	Smith	16	1762
	Trutch		1794
CWHds1	Ainslie	424	9
	Anderson	423	30
	Chilliwack	417	218
	Coquihalla	421	259
	East Harrison	414	355

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
CWHds1 (cont'd)	Fraser Valley South	401	429
	Gates	320	450
	Nahatlatch	416	908
	Silverhope	418	1140
	Whistler	314	1419
	Yale	422	1446
CWHds2	Crag		269
CWH mm1	Caycuse		196
	Cous		266
	Gordon		479
	Quadra		1050
CWH mm2	Caycuse		196
	Chemainus		209
	Corrigan		263
	Cous		266
	Rosewall		1089
CWHms1	Lower Squamish	307	796
	Tulameen	10	1320
CWHvh1	Tlupana		1284
CWHvh3	Kunghit Island	R6_437	2223
CWHvm1	Brittain	218	143
	Chapman	225	200
	East Harrison	414	355
	Hatzic	408	527
	Holberg		556
	Howe	227	579
	Powell Lake	212	1035
	Salmon Inlet	224	1099
	Thurlow		1277
	Tlupana		1284
	West Harrison	410	1412
CWHvm2	Haslam	216	524
	Holberg		556
	Lois	217	759
CWHwm	Anyox		35
	Barrington River		230
	Inklin River		597

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
CWHwm (cont'd)	Kusawa River		712
	Lower Stikine River		797
	Unuk River		1334
CWHws1	Nass River Kalum		924
ESSFdc2	Kelly	B05	1999
ESSFdc3	Campbell	9	2037
	Tranquille	7	2036
ESSFdh1	Ainslie	424	9
ESSFdk1	Alexander - Line	C20	1929
	Bloom - Caven	C10	1988
	Corbin Creek	C19	1947
	Cranbrook	C30	1957
	Doctor/Fir	I12	1915
	Fording River	C21	1907
	Hellroaring - Meachen	C04	1963
	Mayook - Wardner	C36	1968
	Perry - Moyie	C02	1961
	Skookumchuck/ Torrent	I03	1928
	West Flathead	C16	1977
ESSFdk2	Fording River	C21	1907
	Jumbo	I16	1912
	Lower Spillimacheen	I35	1872
	Upper Bull	C27	1922
	Upper Elk	C22	1890
ESSFmk	Clore		237
	Nadina		907
	Tweedsmuir North		2204
ESSF mm1	Bastille		1476
	Castle		1501
	Forgetmenot		1558
	Holmes		1597

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
ESSF mm1 (cont'd)	McBride-Dunster		1666
	Mount Robson		2217
ESSF mm2	Mount Robson		2217
ESSFmw1	Siska		1146
	Spius	4	1198
	Tulameen	10	1320
ESSF mw2	Connel Creek		256
	Gates	320	450
	Kwoiek		718
ESSFun	Atlin Lake		45
	Kakiddi Creek		630
	Kusawa River		712
	Nakina River		914
	Sheslay River		1133
	Tutshi River		1324
	Upper Iskut River		1352
ESSFvc	Fish	N531	1874
	French	R5	1827
	Tum	24	2015
ESSFwc2	Adams Lake	12	2029
	Anstey		33
	Avola	25	2016
	Barriere	11	2025
	Blackwater	G16	1849
	Cayenne	23	2024
	Clearwater	18	2018
	Crowfoot		283
	Mad	21	2019
	Mica	22	2022
	Pukeashun		1043
	Raft	20	2017
	Redrock	R6	1829
	Seymour		1825
	Tum	24	2015
	Vavenby	19	2021
	Ventigo	G14	1854

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
ESSFwh1	Barnes - Whatshan	N520	1930
	Caribou	N522	1934
	Cherryville		1817
	Cranberry	R2	273
	Fish	N531	1874
	Fosthall	N527	1917
	Gladstone	N518	1951
	Hills	N523	1931
	Hoder	N516	1950
	Idaho	N524	1932
	Kaslo River	K12	1935
	Kingfisher		664
	Koch	N517	1956
	Lemon	N515	1952
	Mabel		809
	Pedro	N513	1966
	Perry	N514	1960
	Upper Kettle		1355
	Upper Shuswap		1826
	Vipond	N526	1924
	Woden	N521	1948
ESSFwv	Squingula		1770
ESSFxc3	Big Bar	r5_bigb	2110
ICHdm	Galbraith - Dibble	C28	1938
	Hawkins Creek	K03	2000
	Lamb Creek	C03	1984
	Moyie Lake	C01	1981
	Moyie River	K02	2007
	Redding Creek	C05	1958
ICHdw1	Duck Lake	K25	1980
	Fry Creek	K15	1926
	Goat River	K06	1976
	Hamill Creek	K16	1918
	Hawkins Creek	K03	2000
	Johnston	N510	1969
	Kid Creek	K05	1993

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
ICHdw1 (cont'd)	Lasca Creek	K09	1970
	Moyie Lake	C01	1981
	Moyie River	K02	2007
	Riondel	K14	1936
	Rossland	N502	2008
	Stagleap	N505	1995
	Summit Creek	K01	2003
ICHdw3	Avola	25	2016
	Clearwater	18	2018
	Mad	21	2019
	Mica	22	2022
	Raft	20	2017
ICHmc1	Bulkley		154
	Reiseter		1073
ICHmk1	Salmon Arm		1098
	Upper Salmon		1372
ICHmk2	Campbell	9	2037
	Clearwater	18	2018
	Darfield	15	2027
	Heffley	8	2033
	Skull	14	2030
ICHmk5	Kootenay	G28	1870
	Kootenay National Park	G28P	1873
	Steamboat	I29	1883
	Twelve Mile	I38	1871
	West Bench	G23	1855
ICHmm	Albreda	28	2013
	EastTwin-McKale		1542
	Holmes		1597
	Hugh Allan		1601
	McBride-Dunster		1666
	Mount Robson		2217
	SouthTrench		1767
ICHvc	Middle Iskut River		858
ICHvk2	Fraser		1564
	Gleason		1577

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
ICHvk2 (cont'd)	Humbug		1602
	Jarvis		1614
	Kenneth		1621
	Kitchi		1625
	Woodall		1815
ICHwc	Lower Stikine River		797
	Stikine River		1214
	Upper Iskut River		1352
ICHwk1	Adams Lake	12	2029
	Barriere	11	2025
	Cayenne	23	2024
	Cranberry	R2	273
	Crowfoot		283
	Eagle River		345
	French	R5	1827
	Hills	N523	1931
	Kingfisher		664
	Mad	21	2019
	McKian - Schroeder	K26	1927
	Mica	22	2022
	Mulvehill	R4	897
	Pukeashun		1043
	Raft	20	2017
	Tum	24	2015
ICHwk2	Black Creek	r5_blac	2051
	Horsefly	r5_hors	2168
	Likely	r5_like	2166
	Lower Cariboo	r5_lowe	2157
	Polley	r5_poll	2161
	Wasko/Lynx	r5_wask	2049
ICHwk3	Dome		1529
	Humbug		1602
	McBride-Dunster		1666
ICHwk4	Bowron		1490
	Bowron	r5_bowo	2187
	Cariboo Lake	r5_cari	2152

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
ICHwk (cont'd)	Grizzly		1583
	Indianpoint	r5_indi	2186
	Kenneth		1621
	Lower Cariboo	r5_lowe	2157
	Matthew	r5_matt	2189
	Purden		1735
	Sandy	r5_sand	2188
IDFdw	Atnarko	r5_atna	2180
	Big Stick	r5_bigs	2077
	Chilko	r5_chlk	2192
	Franklyn	r5_fran	2194
	Nemiah	r5_nemi	2099
	Nostetuko	r5_nost	2111
	Nude Creek	r5_nude	2108
	Telegraph	r5_tele	2179
	Westbranch	r5_west	2087
IDFww	Anderson	423	30
	Big Stick	r5_bigs	2077
	Billygoat	308	103
	Birkenhead	319	104
	Gates	320	450
	Kwoiek		718
	Lizzie	321	755
	Mehatl	413	847
	Nahatlatch	416	908
	Spuzzum	415	1201
	Tuwasus	310	1325
MHmm2	Barrington River		230
	Cranberry		2239
	Inklin River		597
	Ishkheenickh		604
	Lower Iskut River		780
	Lower Stikine River		797
	Sheslay River		1133
	Unuk River		1334
MHun	Kusawa River		712
MSdc2	Nemiah	r5_nemi	2099

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
MSdk	Albert	I22	1882
	Bugaboo	I31	1881
	Cross	I23	1869
	Findlay	I01	1923
	Galbraith - Dibble	C28	1938
	Jumbo	I16	1912
	North White	I08	1900
	Palliser	I20	1884
	Toby	I15	1902
	Upper Bull	C27	1922
	Upper Elk	C22	1890
	West Elk	C23	1913
MSdm1	Harris		522
	Rendell	B11	1955
MSdm2	Campbell	9	2037
	Smith-Willis	12	1172
	Upper Salmon		1372
MSdm3	Barriere	11	2025
	Campbell	9	2037
	Darfield	15	2027
MSdv	Beece Creek	r5_beec	2114
MSdw	Alexander - Line	C20	1929
	Corbin Creek	C19	1947
	Cranbrook	C30	1957
	East Flathead	C18	1975
	Lamb Creek	C03	1984
	Lost Dog - Mather	C31	1939
	Lower Elk	C24	1943
	Moyie Lake	C01	1981
	Perry - Moyie	C02	1961
	Skookumchuck/ Torrent	I03	1928
	West Elk	C23	1913
	West Flathead	C16	1977
	Wigwam River	C14	1992
	Yahk River	C09	1996

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
MSxk1	Summers	7	23
MSxk2	Bonaparte Lake	r5_bona	2105
	Campbell	9	2037
	Deadman	r5_dead	2118
	Loon	r5_loon	2120
	Lower Bonaparte	2	2035
	Stump Lake	31	2044
	Tranquille	7	2036
	Upper Nicola	3	1823
	Upper Salmon		1372
MSxk3	Big Bar	r5_bigb	2110
MSxv	Atnarko	r5_atna	2180
	Baezaeko	r5_baez	2137
	Baker	r5_bake	2142
	Bambrick	r5_bamb	2096
	Big Creek	r5_bigc	2088
	Clisbako	r5_clis	2158
	Clusko	r5_clus	2164
	Dash	r5_dash	2116
	Gaspard	r5_gasp	2097
	Haines	r5_hain	2076
	Holtry	r5_holt	2173
	Marmot	r5_marm	2138
	Nazko	r5_nazk	2169
	Nimpo	r5_nimp	2053
	Palmer/Jorgenson	r5_palm	2175
	Punky Moore	r5_punk	2163
	Puntzi	r5_punt	2059
	Ramsey	r5_rams	2165
	Tibbles	r5_tibb	2143
	Toil	r5_toil	2153
	Wentworth	r5_went	2156
SBPSmc	Baezaeko	r5_baez	2137
	Chine	r5_chin	2133
	Christenson Creek	r5_chri	2159
	Coglistiko	r5_cogl	2139
	Entiako		1549

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
SBPSmc (cont'd)	Entiako		2231
	Pan	r5_pann	2148
	Toil	r5_toil	2153
SBSdk	Burns Lake East		160
	Burns Lake West		161
	Chelaslie		208
	Cheslatta		212
	Endako		1548
	Entiako		2231
	Entiako		1549
	Halett		1588
	Intata		598
	Kluskus		1635
	Lucas		1660
	Nadina		907
	Nechako		1694
	Pinchi		1726
	Tachick		1781
	Tahtsa		1247
	Tatelkuz		1783
	TFL42		1789
	Tweedsmuir North		2204
	Valley		1385
SBSdw1	Abhau	r5_abha	2127
	Dunkley		1534
	Hixon		1594
SBSdw2	Baezaeko	r5_baez	2137
	Baker	r5_bake	2142
	Bradley Creek	r5_brad	2070
	Bridge Creek	r5_bric	2092
	Chilako		1506
	Euchiniko	r5_euch	2125
	Green Lake	r5_gree	2104
	Marmot	r5_marm	2138
	Narcosli	r5_narc	2151
	Pelican	r5_peli	2126
	Ramsey	r5_rams	2165

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
SBSdw2 (cont'd)	Twan	r5_twan	2170
	Williams Lake	r5_wilk	2061
SBSmc1	108 Mile Lake	r5_oneo	2075
	Dragon	r5_drag	2146
	Murphy Lake	r5_murp	2063
SBSmc2	Baezaeko	r5_baez	2137
	Baker	r5_bake	2142
	Bulkley		155
	Burns Lake East		160
	Cheslatta		212
	Coglistiko	r5_cogl	2139
	Crag		269
	Endako		1548
	Francois West		425
	Halett		1588
	Intata		598
	Lucas		1660
	Marmot	r5_marm	2138
	Mud		1684
	Nadina		907
	Narcosli	r5_narc	2151
	Nechako		1694
	Nithi		1699
	Pantage	r5_pant	2131
	Pelican	r5_peli	2126
	Ramsey	r5_rams	2165
	Snaking	r5_snak	2136
	Stuart		1774
	Tachick		1781

BEC	LU Name[a]	LU Number[b]	GIS ID[c]
SBSmc2 (cont'd)	Tibbles	r5_tibb	2143
	Topley		1292
	Upper Dean	r5_updn	2181
	Wentworth	r5_went	2156
SBSmk1	Dunkley		1534
	Mollie		1676
	Muskeg		1687
	Pinchi		1726
	Prince		1731
	Stuart		1773
	Stuart		1775
	Tudyah A		1796
SBSmk2	Morfee		1678
	Muscovite		2214
	Nabesche		1690
	Selwyn		1750
SBSmm	Darfield	15	2027
	Vavenby	19	2021
SBSmw	Abhau	r5_abha	2127
	Dunkley		1534
	Hixon		1594
	Nechako		1695
	Prince		1731
	Punchaw		1734
SBSun	Barrington River		230
	Kakiddi Creek		630
	Sheslay River		1133
	Stikine River		1214
	Tutshi River		1324

[a] Landscape Unit Name is not unique within the provincial spatial file; multiple LUs may have the same name, even within the same BEC subzone/variant.
[b] Not all Regions have assigned Landscape Unit Numbers.
[c] LANDSCAPE_UNIT_PROVID is the unique identifier for Landscape Units in the provincial WHSE_LAND_USE_PLANNING.RMP_LANDSCAPE_UNIT_SVW spatial file available for download at https://catalogue.data.gov.bc.ca/dataset/11277e35-d8be-47e4-bb1f-c38e393179c6; note that some LUs are separated into multiple Biodiversity Emphasis Options specified by the BEO_Sub_Type field, which is not reflected in the LANDSCAPE_UNIT_PROVID code.

Appendix 7. Field Verification Submission Form and Spatial Data Specifications

The Field Verification Submission Form must be used to submit the outcomes of field verification. It can be access at:

IDIR: https://submit.digital.gov.bc.ca/app/form/submit?f=b15b1975-3caa-4984-a183-471c5610c8a5
BCeID: https://submit.digital.gov.bc.ca/app/form/submit?f=e4591d9b-9005-4bd6-8145-2c92ce890d91

Each submission accommodates one Cutting Permit with multiple blocks, where each block can contain more than one Forest Type.

Form Overview (as of July 20, 2022)**:**

Field verification submission form

BRITISH COLUMBIA | Ministry of Forests

Instructions

1. Complete **1 form** per **cutting permit.**
    - Enter additional cut blocks for the cutting permit using the "Add another cut block button"
2. Submit 1 professional rationale and 1 spatial file for each cutting permit. Submit as many PDF maps as you need to for each permit.
    - Name the files in the format found in "Attach files" section.
    - A single file can't be more than 25MB.
    - You can attach as many files as needed.

Note: Attach your files before entering data. Files can't be attached after 5 minutes. There's no time limit to complete the form.

^ **Attach files**

Attach the following files:

1. **Professional rationale**

- Accepted format: PDF
- Use the naming style: **Professional_Rationale_<ForestFileID_CuttingPermitID>**

2. **PDF map**

- Use the naming style: **PDF_Map_file_<ForestFileID_CuttingPermitID>**

3. **Spatial file**

- Accepted formats: SHAPE (ZIP), KML, KMZ, GDB (ZIP)
- Use the naming style: **Spatialfile_<ForestFileID_CuttingPermitID>**

A single file can't be more than **25MB.** You can attach as many files as needed.

Upload your files *

File Name	Size	Type

Drop files to attach, or browse

^ **Contact information**

Licensee, agreement holder, or BCTS office *

Submitter first name

Optional

Submitter last name *

Submitter phone number *

(___) ___-____

Submitter email *

^ **Tenure details and field observations**

Natural resource district *

[▾]

Forest file ID or timber sale licence ?

[ ]

Optional for BCTS

Cutting permit

[ ]

Optional for BCTS

ESF submission ID ?

[ ]

Optional

Deferral area mapping by cut block

Cut block ID *

[ ]

Total cut block hectares *

[ ]

Hectares originally mapped as priority deferral area: ? *

[ ]

Check all that apply: *

- ☐ Big treed
- ☐ Ancient
- ☐ Remnant

Replacement hectares added to deferral area mapping ?

[ ]

Hectares **deleted** from deferral area mapping: ?

[ ]

Hectares **unchanged** from deferral area mapping ?

[ ]

+ Add another cut block

Collection notice:

The Ministry of Forests is collecting your personal information under section 26(c) of the Freedom of Information and Protection of Privacy Act. It will be used to evaluate old growth areas identified by the Old Growth Technical Advisory Panel. If you have questions about its collection, contact your natural resource district office.

Spatial Data Format Specifications

The spatial data format specifications and empty spatial data file templates are available in the 'Supporting Resources' section of the **Priority old forest deferral area field verification** webpage (https://www2.gov.bc.ca/gov/content?id=FA95ADB67F584002993F7DA235FF7179)

Appendix 8. Wildfires, Beetle Mortality, Fuel Treatments, Wildlife Habitat Enhancement, and Ecosystem Restoration

This section provides information to support interim harvesting decisions while longer-term forest management approaches are considered.

Naturally disturbed areas

Unburned and areas of low burn severity within past fire perimeters were included in the deferral analyses. For fires that burned in 2021, burn severity mapping was not available. For Priority Old Forest Deferral Area field verification purposes, unburned areas and areas of low burn severity would have been identified by the deferral prioritization methods and should still be considered as Priority Old Forest Deferral Areas. Areas of moderate or high burn severity do not meet priority deferral criteria. Note that the provincial burn severity mapping program does not assess fires that are < 100 ha, and these smaller fires, from 2021 and previous, may be identified as deferrals, even where burn severity is high or moderate.

Stands with > 70% mortality, by merchantable volume (including all species in the stand), from insects or diseases (primarily mountain pine beetle) are also excluded from Priority Old Forest Deferral Area mapping, and field verification procedures can be applied to confirm that the > 70% mortality threshold has been exceeded (e.g., using procedures applicable to deferrals (Step 4) and the cruising manual sections specific to forest health factors). Stands with < 70% mortality (merchantable volume, all species) that meet other deferral criteria are still considered Priority Old Forest Deferral Areas.

Alternative stand interventions

Review prescriptions to assess the likelihood that old forest values will be maintained during harvesting where ecosystem restoration, fuel management, wildlife habitat restoration, or other activities where timber harvesting is not the primary objective are proposed in Priority Old Forest Deferral Areas. It may be possible to apply these alternative stand interventions within Priority Old Forest Deferral Areas, particularly in the driest ecosystems in British Columbia where maintenance of old forest values is highlighted in prescriptions. This includes plans to maintain the large, old trees, as well as some snags and large logs for old-growth wildlife and biodiversity values.

Fire is a natural component of ecosystems and has been critical in shaping old-growth conditions in the driest forests in British Columbia. Historically, these ecosystems are thought to have consisted of a natural mosaic of mostly uneven-aged forests interspersed with grassy and shrubby openings and patches of denser forest that escaped low-intensity fires. Fires were historically responsible for maintaining the vegetation species composition and forest stand structure, and large, old trees with thick, fire-resistant bark provided old growth habitats. In many parts of the province, fire exclusion has resulted in forest ingrowth and has increased high severity and stand-replacing fire hazard. The driest ecosystems in British Columbia include the BG, PP, and IDF zones. In some situations, treatments to address fuel risk may also be applicable in the drier site series in the dry subzones of the ICH, MS, SBS, and SBPS and potentially the driest areas of the CFD and the very dry CWH subzones.

Not all alternative stand interventions are expected to be compatible with old forest deferrals. Treating adjacent areas may provide increased resilience for landscapes when treatments are not expected to maintain old forest attributes within priority deferral areas.