

# Using Stratification to Achieve Non-Timber Objectives

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## **Introduction**

This report provides guidance on how current reforestation survey regulations can facilitate retention of broadleaf species to meet non-timber management objectives.

In 2007, the [Forest Cover Stratification and Milestone Declarations](#) document was published to explain the addition of the Forest Planning and Practices Regulation (FPPR) sections 46.11 and 97.1.

This document intends to:

- Expand on the application of FPPR 46.11(2)
- Show how it can be used proactively to achieve non-timber objectives
- Demonstrate how to strategically prescribe vegetation management
- Provide guidance on silviculture surveying and RESULTS reporting

Supporting silviculture survey reference documents are available online<sup>1</sup>.

The regulations described in this document do not apply to woodlots which are managed under the Woodlot Licence Planning and Practices Regulation.

## **Free Growing**

The Forest and Range Practices Act (FRPA) defines free growing (FG) as “a stand of healthy trees of a commercially valuable species, the growth of which is *not impeded by competition from plants, shrubs, or other trees.*”

This FRPA definition of free growing and Section 97(6)<sup>2</sup> of the Forest Planning and Practices Regulation triggers vegetation management on thousands of hectares per year provincially.

## **Maintaining Broadleaf Trees**

The free growing policy addresses broadleaf competition to maintain an economically valuable supply of commercial timber and to be consistent with the timber supply analysis and forest

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<sup>1</sup> [Silviculture survey reference documents - Province of British Columbia \(gov.bc.ca\)](#)

<sup>2</sup> If a stand will more likely than not be impeded in its growth due to competition from plants, shrubs, or other trees 20 years after the commencement date, then it is not free growing.

management assumptions. However, it is important to recognize the value of broadleaf trees for wildlife habitat, biodiversity, ecological resilience, nutrient cycling, and wildfire risk mitigation.<sup>3 4</sup>

With the intentional application of FPPR 46.11(2), it is possible to maintain a broadleaf component within most conifer stands. Not all broadleaf trees or patches of broadleaf trees need to be removed to favour conifer production. **Licensees are encouraged to use Section 46.11(2) to maintain broadleaf strips and polygons, where possible, to achieve non-timber objectives.**

### **Regulation**

FPPR 46.11(1) requires the free growing obligation to be met on each hectare within the net area to be reforested (NAR), unless otherwise specified in a forest stewardship plan (FSP).

FPPR 46.11(2) provides some flexibility in meeting this requirement. There is a critical difference between meeting obligations at regeneration delay and free growing.

*“(2) If the stocking within a standards unit conforms to the applicable stocking standards, an area within the standards unit is not required to meet the applicable stocking standards if*

*(a) the area is less than 1 ha, or*

*(b) when the free growing stand is established,*

*(i) the area is mappable and is at least 1 ha but no more than 2 ha, and*

*(ii) the portion of the standards unit that is occupied by areas referred to in subparagraph (i) does not exceed 5% of the standards unit.”*

FPPR 97.1 provides an option for a forest professional, on behalf of an obligation holder, to submit a declaration where the free growing standard has not been fully met, but it is met to the extent practicable. It should not be used if Section 46.11(2) can apply or if the not free growing status can be addressed by a reasonable intervention like vegetation management.

### **Application of FPPR 46.11(2)**

FPPR 46.11(2)(a)

- If a not free growing (NFG) area is less than 1 hectare, it is not stratifiable.
- If a NFG area is unmappable (<20m wide throughout its length)<sup>5</sup>, it is not stratifiable.
- Non-stratifiable NFG areas are variations within the FG stratum. They do not need to be mapped or surveyed as a separate stratum.
- If the stocking standards are met for the standards unit (SU), the non-stratifiable NFG areas can be maintained without an intervention (e. g., brushing, replant, juvenile spacing, rescheduling the survey), a stocking standard amendment, or a FPPR 97.1 declaration.

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<sup>3</sup> [www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/tree-species-selection-tool/cf\\_broadleaf\\_memo\\_-\\_silviculture.pdf](http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/silviculture/tree-species-selection-tool/cf_broadleaf_memo_-_silviculture.pdf)

<sup>4</sup> [www.for.gov.bc.ca/ftp/hfp/external/!publish/Stocking%20Standards%20for%20FDPs/CF\\_broadleaf\\_memo.pdf](http://www.for.gov.bc.ca/ftp/hfp/external/!publish/Stocking%20Standards%20for%20FDPs/CF_broadleaf_memo.pdf)

<sup>5</sup> A FSP may have a different definition of mappable.

#### FPPR 46.11(2)(b)

- A single 1-2 ha NFG patch may exist, and the obligation will still be met if the patch does not exceed 5% of the SU area and the standards are met overall.
- Multiple 1-2 ha NFG patches may occur, and the obligation will still be considered met if the stratifiable patches cumulatively do not exceed 5% of the SU area and the standards are met overall.
- Non-stratifiable NFG patches do not contribute to the 5% area limit, though they do have an impact on the SU statistics.
- Section 46.11(2)(b) is beneficial for standards units > 20 ha. If the SU is ≤20 ha, the 5% rule prevents the NFG patch from being >1 ha. If the SU is ≥40 ha, it is possible to have a patch up to 2 ha. For larger SUs, it is possible to have multiple patches >1 ha.

#### **Not Free Growing**

Free growing status is based on a tree level and a stratum level assessment. A free growing tree must meet the criteria of a well-spaced tree and the:

- Forest health damage criteria
- Minimum FG height
- Vegetation competition criteria

At the stratum level, there needs to be a sufficient density of ecologically suitable free growing trees per hectare and less than the maximum density of countable conifers.

There can be a variety of reasons for NFG trees or patches within a standards unit. As they become more numerous, it becomes increasingly difficult to meet the statistical requirements. If FG stocking levels are borderline, it is likely not possible to maintain a stratifiable NFG patch or strip, due to broadleaf trees or any of the above reasons.

There may be circumstances where Section 46.11(2) can apply, but it is necessary to address NFG polygons with low stocking or measurable forest health damage. The 5% limit for NFG area applies to all stratifiable NFG polygons, regardless of the cause. It should first be utilized to address areas that cannot be easily treated.

#### **Designing Treatment Areas**

For many standards units, the presence of broadleaf trees is the primary factor preventing free-growing status. Broadleaf trees often lead to large NFG polygons, far exceeding 2 hectares or the 5% limit. To achieve FG under conifer stocking standards, vegetation management is required on these sites.

However, the brushing treatment area does not need to include the entire NFG area, assuming there are no other factors reducing free growing density. Areas can be intentionally left, aligned with FPPR 46.11(2). These no-treatment zones or broadleaf “leave areas” can be located based on the following priority list:

1. Areas that are NFG, with or without vegetation management (e. g. low well spaced (WS) density, forest health damage).

2. Areas of significance for non-timber values. For example:

- Areas with salt licks or calving grounds
- Areas with medicinal or edible plants
- Areas overlapping with riparian features
- Areas requiring a visual buffer for wildlife

The “leave areas” can also be designed to maintain connectivity across a cutblock. Non-stratifiable broadleaf strips (<20m wide or <1 ha) can be left between internal reserves or areas of significance and the timbered block boundary.

Please consult with subject matter experts and local First Nations to understand what non-timber values could be helped by the presence of broadleaf trees in your area.

3. If the above do not apply, locate broadleaf leave patches/strips in areas with reduced conifer stocking, low broadleaf site productivity, and/or shade tolerant crop species.

4. If the above do not apply, create leave areas where brushing treatments would be logistically challenging or less safe.

### **Surveying**

The key to credible survey results is selecting a sampling method and intensity suitable for the complexity of the stratum being surveyed.

With the application of FPPR 46.11(2)(a), the variability of the population increases, and it cannot be addressed by stratification. A more structured sampling method and a higher sampling intensity are required. Grid sampling is recommended.

With FPPR 46.11(2)(b), the same issues apply since stocking needs to be measured across the SU. If the statistical analysis indicates that the standards are met, then the mappable 1-2 ha NFG polygon(s) should be stratified and reported separately.

The surveyor must collect and summarize silviculture and inventory data for the FG and mappable NFG strata. For the NFG stratum, surveyors may choose to produce the labels based on visual observation or any number of plots. The usual expectation of 5 plots per stratum is not required.

## **Reporting**

The 2007 [Forest Cover Stratification and Milestone Declarations](#) document provided interim procedures for declarations using FPPR 46.11(2). These procedures were never updated, so the document still applies.

To indicate that FPPR 86(3)(d)(iii)<sup>6</sup> applies, please add “46.11(2)(b)” as a comment to the SU’s declaration. The comment would confirm that the area not meeting the stocking standards meets the tests as specified in the regulation. The comment would remove the stratum from investigative reports based on the FG density and minimum stocking standard.

For the forest cover reporting, please consider the following:

- The [BC Silviculture Survey Procedures Manual](#) has guidance on SU nomenclature when stratifying and reporting survey compilations into RESULTS.
- The stocking status for both strata should be IMM.
- Spatial should be submitted with all strata delineated.

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<sup>6</sup> An agreement holder must report to the district manager (d) an update of the forest cover inventory for each area in which during the reporting period (iii) a free growing stand has been declared under section 97 or 97.1 of this regulation or the requirements of section 46.11(2)(b) of this regulation have been met.

## Appendix A: Example of Designing a Brushing Treatment (*map below*)

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Block Q523 is a conifer stand with extensive broadleaf natural infill. The broadleaf stocking is too low and patchy to consider broadleaf stocking standards, so a brushing treatment will be required across both standards units to achieve free growing status.

The forester wants to use FPPR 46.11(2) when designing the brushing treatment to enhance stand diversity and address non-timber values.

SU1 has great WS stocking overall, with no forest health issues and heights above minimums. The SU should meet the stocking standard if a stratifiable NFG broadleaf patch is retained.

SU2 has lower stocking, impacted by early forest health damage. The well-spaced trees are healthy and meet minimum heights. The SU likely would not meet the stocking standards if a stratifiable broadleaf patch was maintained.

The forester assesses the cutblock for non-timber values. Both SUs have riparian features that connect with fish streams. There are numerous internal retention patches. Between falling corner 92 and 97, SU1 has heavy elk use with continued browse, lower WS stocking, and many bedding sites.

The forester plans the following:

Stratum	Governing SU	Stratum Status	Size
A	1	FG (after treatment)	35.6
B	2	FG (after treatment)	12.1
C	1	NFG (no treatment)	1.8
D	1	NFG (no treatment)	0.3
E	1	NFG (no treatment)	0.2
F	1	NFG (no treatment)	0.3
G	1	NFG (no treatment)	0.2
H	2	NFG (no treatment)	0.1
I	2	NFG (no treatment)	0.2
J	2	NFG (no treatment)	0.4
K	2	NFG (no treatment)	0.3

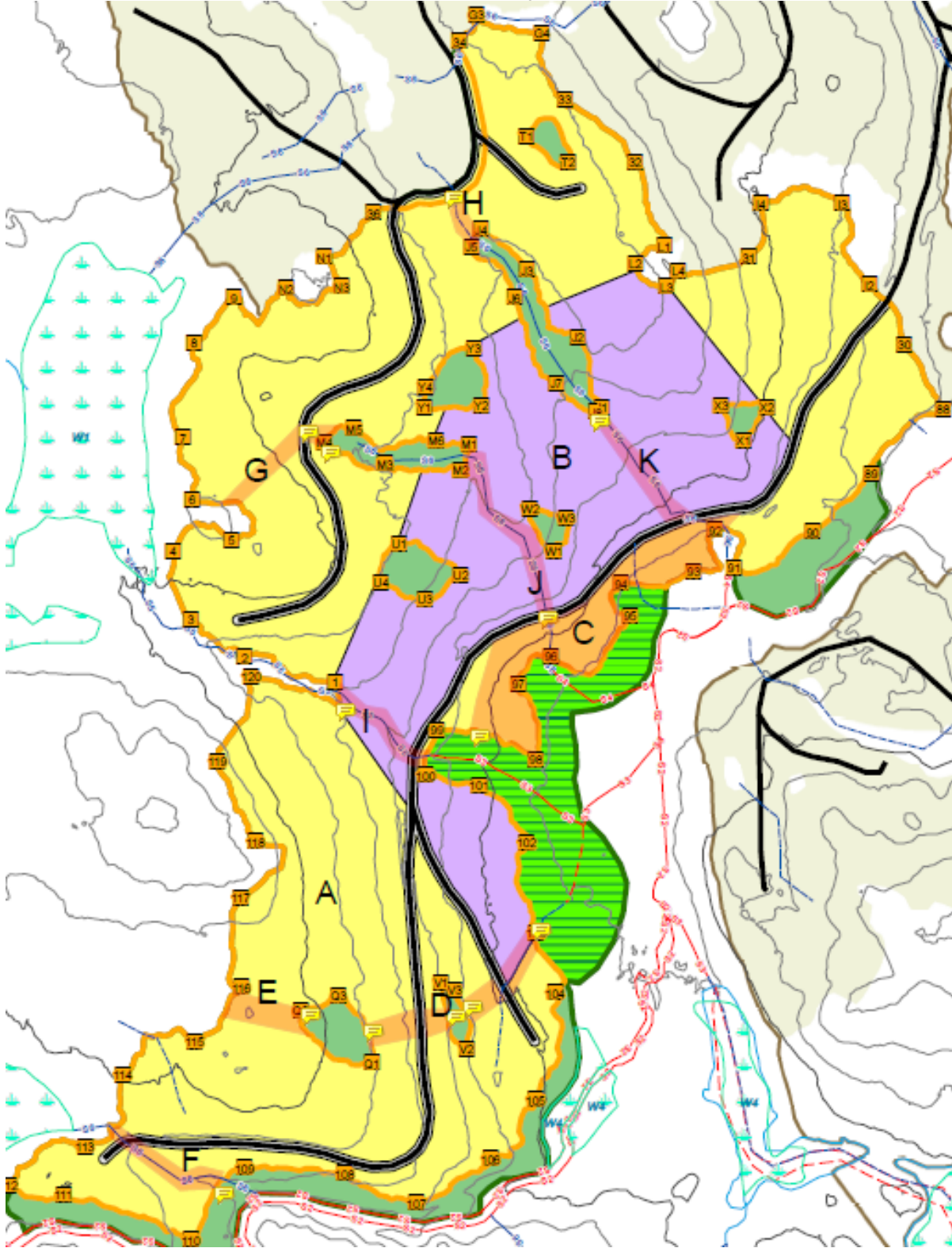
*Note: Strata D-K would not normally be stratified. They are <1 ha.*

The forester prioritizes the non-stratifiable broadleaf strips along the riparian features and between the internal retention and timbered block boundary. The forester will retain a 1.8 ha broadleaf patch (Stratum C) in the area with extensive elk bedding sites and lower conifer WS stocking. The broadleaf trees will provide cover for the elk and will compete with fewer crop trees.

If the stocking within SU 1 conforms to the stocking standards post-treatment, Stratum C can be retained as a broadleaf patch because it is <2 ha and <5% of the SU area.

At FG, Strata A, B, and C will need to be mapped, surveyed, and reported. Strata D, E, F, and G will be combined with Stratum A. Strata H, I, J, and K will be combined with Stratum B.

This map shows Block Q523. The yellow area is SU1; the purple area is SU2. The highlighted pink areas will be the broadleaf no-treatment zones. They have been labelled with their stratum ID.

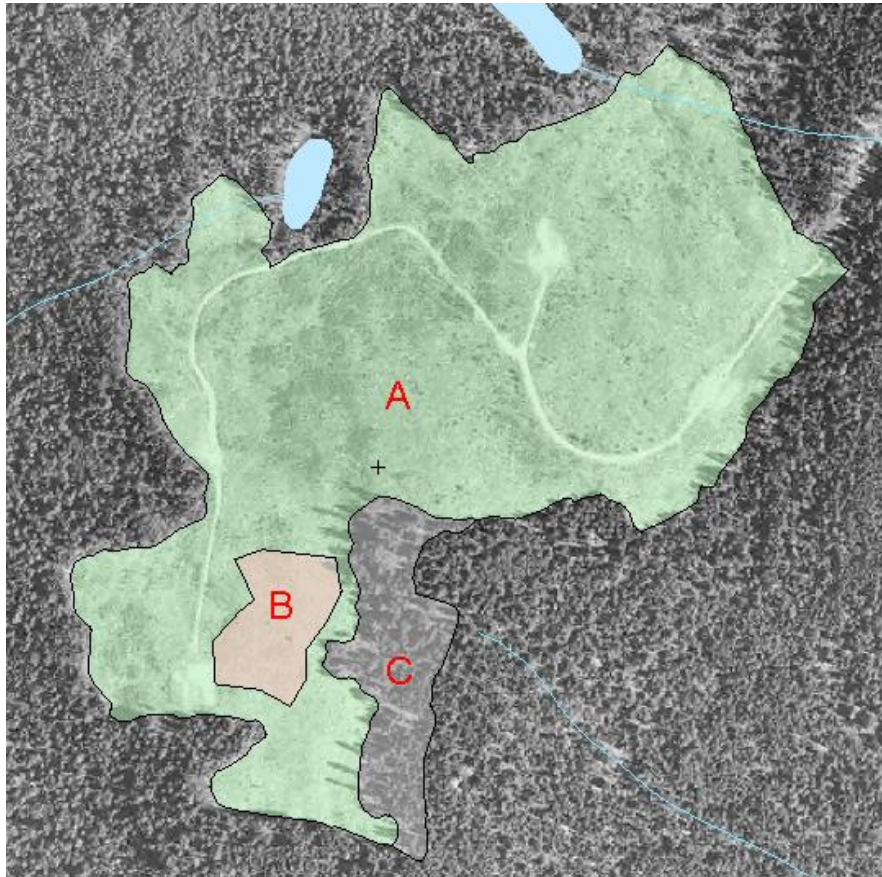


## Appendix B: Survey Examples

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### 1 SU, Patch > 2 ha

Stratum	Governing SU	Stratum Status	Size
A	1	FG	51.0
B	1	NFG (broadleaf competition)	2.5
C	N/A	WTRA	5



#### **SU1 (53.5 ha) is NFG.**

- The statistics pass for the SU overall, but FPPR 46.11(2)(b)(i) is not met.
- Stratum B is >2 ha.

#### **Recommendations:**

1. Vegetation management is required on 0.5 ha of Stratum B to make it  $\leq 2$  ha.

After the recommended number of growing seasons post-brushing:

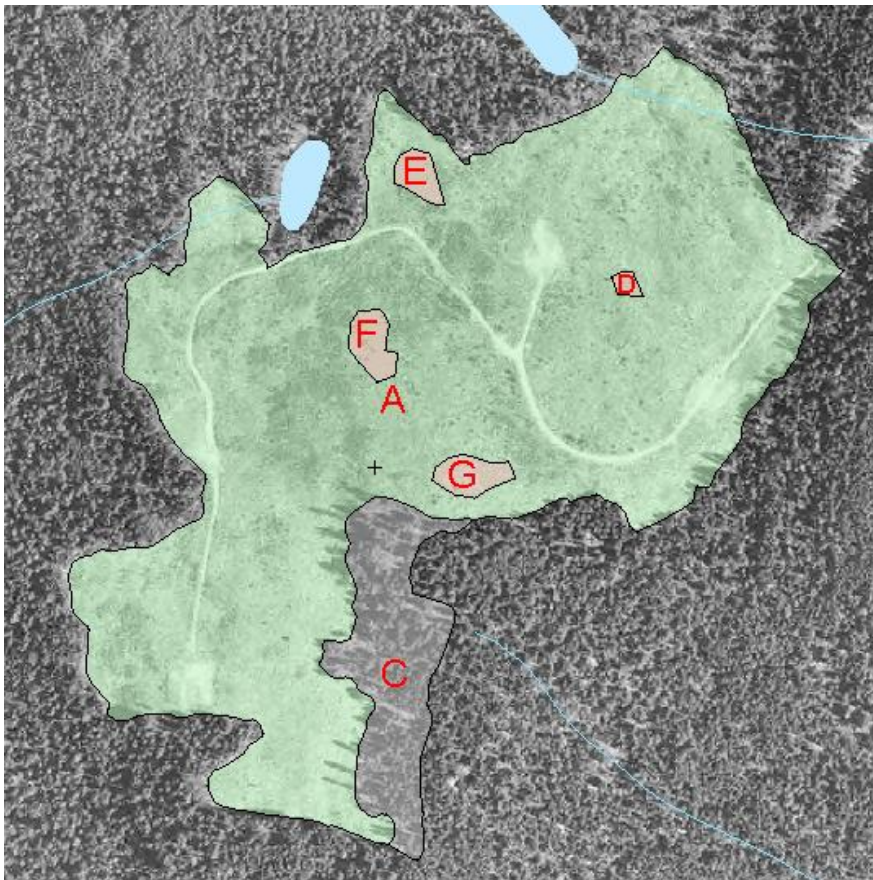
2. Collect survey information on Strata A and B. Stratum B can be lightly surveyed.
3. Report spatial and forest cover information for both strata to RESULTS.
4. Declare SU1 free growing. Indicate that the requirements of FPPR 46.11(2)(b) have been met



### 1 SU, patches less than 1 ha

Stratum	Governing SU	Stratum Status	Size
A	1	FG	37.5
C	N/A	WTRA	5
D	1	NFG (low stocking)	0.2
E	1	NFG (forest health)	0.6
F	1	NFG (broadleaf competition)	0.8
G	1	NFG (broadleaf competition)	0.9

*\*Note: D, E, F, G would not normally be stratified.*



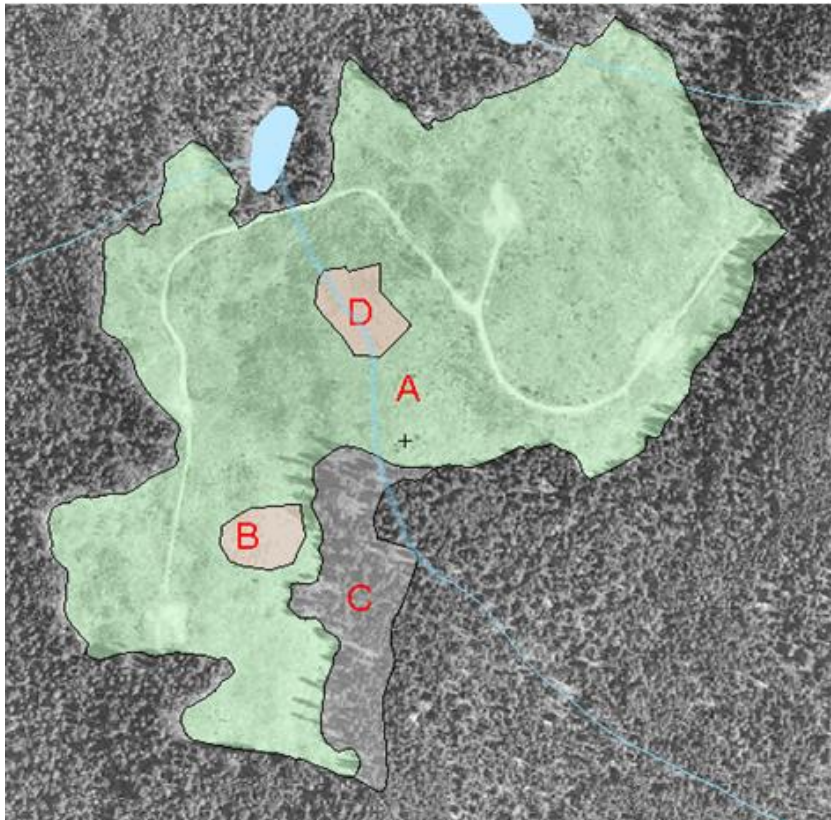
#### **SU1 (40.0 ha) is FG.**

- SU1 meets the stocking standards overall and FPPR 46.11(2)(a).
- All NFG polygons (D, E, F, and G) are non-stratifiable (<1 ha). Their cumulative area does not matter.

**Recommendation:** No action required. Retain the small non-stratifiable broadleaf patches. Survey and report on SU1.

**1 SU, patches >1 ha and < 2 ha, broadleaf competition**

Stratum	Governing SU	Status	Size
A	1	FG	37.6
B	1	NFG (broadleaf competition)	1.6
C	N/A	WTRA	5
D	1	NFG (broadleaf competition)	1.8



**SU1 (41.0 ha) is NFG.**

- The statistics pass for the SU overall, but FPPR 46.11(2)(b)(ii) is not met.
- Strata B and D are stratifiable. Their combined area exceeds 5% of the area of SU1.

**Recommendations:**

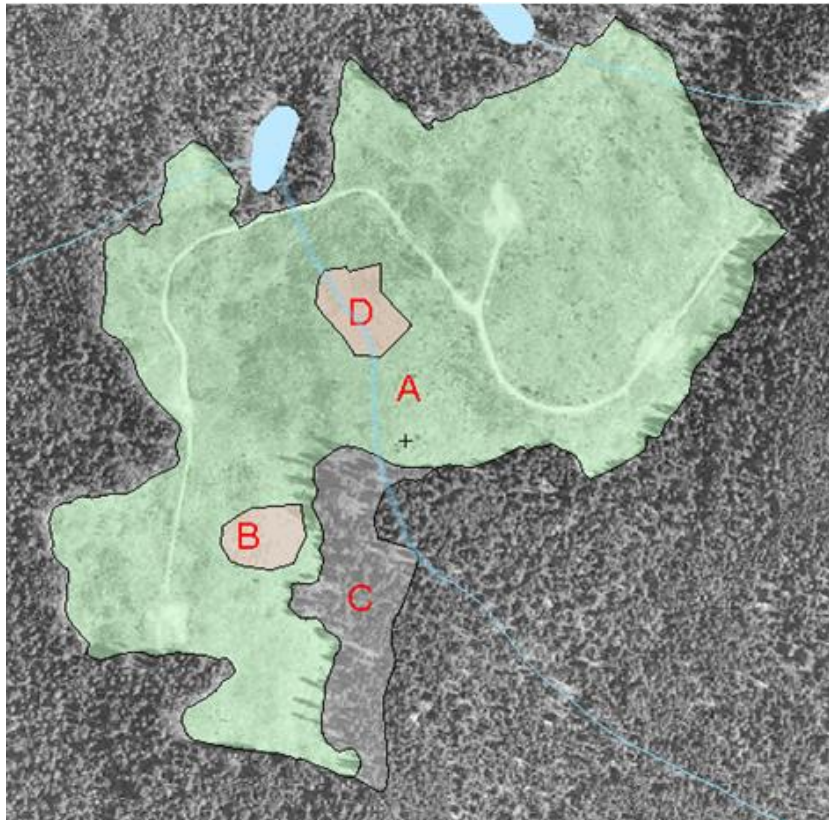
1. Due to the riparian feature, retain Stratum D as the stratifiable NFG broadleaf patch. It is <2 ha and <5% of the area of SU1.
2. Complete vegetation management on 0.7 ha of Stratum B to make it non-stratifiable (<1ha). Lump the remaining broadleaf patch with Stratum A.

After the recommended number of growing seasons post-brushing:

3. Collect survey information on Strata A and D. Stratum D can be lightly surveyed.
4. Report spatial and forest cover information for Strata A and D to RESULTS.
5. Declare SU1 free growing. Indicate that the requirements of FPPR 46.11(2) have been met.

**1 SU, patches >1 ha and < 2 ha, broadleaf competition and low stocking**

Stratum	Governing SU	Status	Size
A	1	FG	37.6
B	1	NFG (low stocking)	1.6
C	N/A	WTRA	5
D	1	NFG (broadleaf competition)	1.8



**SU1 (41.0 ha) is NFG.**

- The statistics pass for the SU overall, but FPPR 46.11(2)(b)(ii) is not met.
- Strata B and D are stratifiable. Their combined area exceeds 5% of the area of SU1.

**Recommendations:**

1. Use FPPR 46.11(2)(b) to address Stratum B given its low well-spaced stocking.
2. Complete vegetation management on 0.9 ha of Stratum D to make it non-stratifiable (<1 ha). Retain the non-stratifiable patch of broadleaf trees along the stream. Lump this area with Stratum A.

After the recommended number of growing seasons post-brushing:

3. Collect survey information on Strata A and B. Stratum B can be lightly surveyed.
4. Report spatial and forest cover information for Strata A and B to RESULTS.
5. Declare SU1 free growing. Indicate that the requirements of FPPR 46.11(2) have been met.