



**ECOSYSTEM ASSESSMENT:  
SUNSHINE COAST COMMUNITY FOREST**

**Block Assessment AN03 and AN3A**

**FOR:**

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## Glossary

Listed Community	A Red-Listed or Blue-Listed ecological community identified by the <a href="#">BC Conservation Data Centre</a> .
Old Forest	Means any of the following: (a) a stand of trees 250 years or older; (b) an old, structurally complex stand comprised mainly of climax species where older seral remnants may still be present in the upper canopy and typically have: (i) standing snags; (ii) rotting logs on the ground; and (iii) patchy understories; or (c) a stand of trees that has reached the climax state for the ecosystem it is found in where trees naturally cycle at an age less than 250 years ( <a href="#">LMH72 - Banner et al. 2019</a> ).
Sufficiently Established	A Red-Listed Plant Community or Blue-Listed Plant Community most commonly associated with late mature or Old Forest stand characteristics, with the exception of floodplains, or a Red-Listed Plant Community or Blue-Listed Plant Community found in a stand not defined as Old Forest but with a complex, open stand structure, along with a quantity and distribution of indicator plants for the listed community, that constitutes an element occurrence with a good or better viability rank ( <a href="#">LMH72 - Banner et al. 2019</a> ).
Ecological Community	Refers to the plant associations from the vegetation classification of the <a href="#">Biogeoclimatic Ecosystem Classification</a> system and other natural plant communities including both forested and non-forested ecosystems (BC CDC 2022). This term can be used to reference the same attributes as the term 'plant community' when the area is not under the Great Bear Rainforest Order ( <a href="#">LMH72 - Banner et al. 2019</a> ).
Plant Community	Refers to plant species composition and relative abundances of plant species that are characteristic of a site unit, and when referring to these attributes specifically in the context of the Great Bear Rainforest Order. Similar to but not completely interchangeable with the term 'ecological community' ( <a href="#">LMH72 - Banner et al. 2019</a> ).
Veteran Overstory Tree	Emergent trees that are at least 200 years old and have a minimum diameter of either 50 cm on dry sites (relative soil moisture regime 2 or lower) or 70 cm on all other sites ( <a href="#">LMH72 - Banner et al. 2019</a> ).

## **ECOSYSTEM ASSESSMENT: SUNSHINE COAST COMMUNITY FOREST**

### **Block Assessment AN03 and AN3A**

## **1 Introduction**

At the request of Warren Hansen, Operations Manager of Sunshine Coast Community Forest (SCCF), Madrone Environmental Services Ltd. (Madrone) conducted an ecosystem assessment for proposed cut blocks AN03 and AN3A within the SCCF tenure. The scope of this assessment was to provide the SCCF with a block level evaluation to determine if there were any Old Forests and/or Sufficiently Established plant communities present and identify the condition of any red- and blue-listed plant communities (Listed Communities) that may be within the proposed cutblocks. An initial draft report was provided to the SCCF in 2022 and based on our findings, with consideration for the ecological values within the planned blocks, changes were made to the engineering of AN03 and AN03A. Prior to the final layout of AN03A, considerations were also given to a subsequent informal block assessment by Laurie Kremsater, RPBio, RPF (LLK Consulting Ltd.) and Anna Yuill, RPBio, FIT, (McTavish Resource & Management Consultants) which was conducted on June 16<sup>th</sup>, 2023.

These block-level assessments were conducted after a broader SCCF tenure-wide assessment of Old Forests was conducted (2021). The objectives of the broader assessment were to identify and characterize selected mature and Old Forest areas in the dominant site series in the Coastal Western Hemlock very dry maritime, eastern (CWHxm1) and the Coastal Western Hemlock dry maritime (CWHdm) Biogeoclimatic (BEC) units so that they can be considered in a recruitment strategy for Ecosystem Based Management within the SCCF. Blocks AN03 and AN3A were not assessed during the larger tenure-wide assessment, however one plot from the broader assessment was near AN03A and is included in the results for reference.

### **1.1 Objectives**

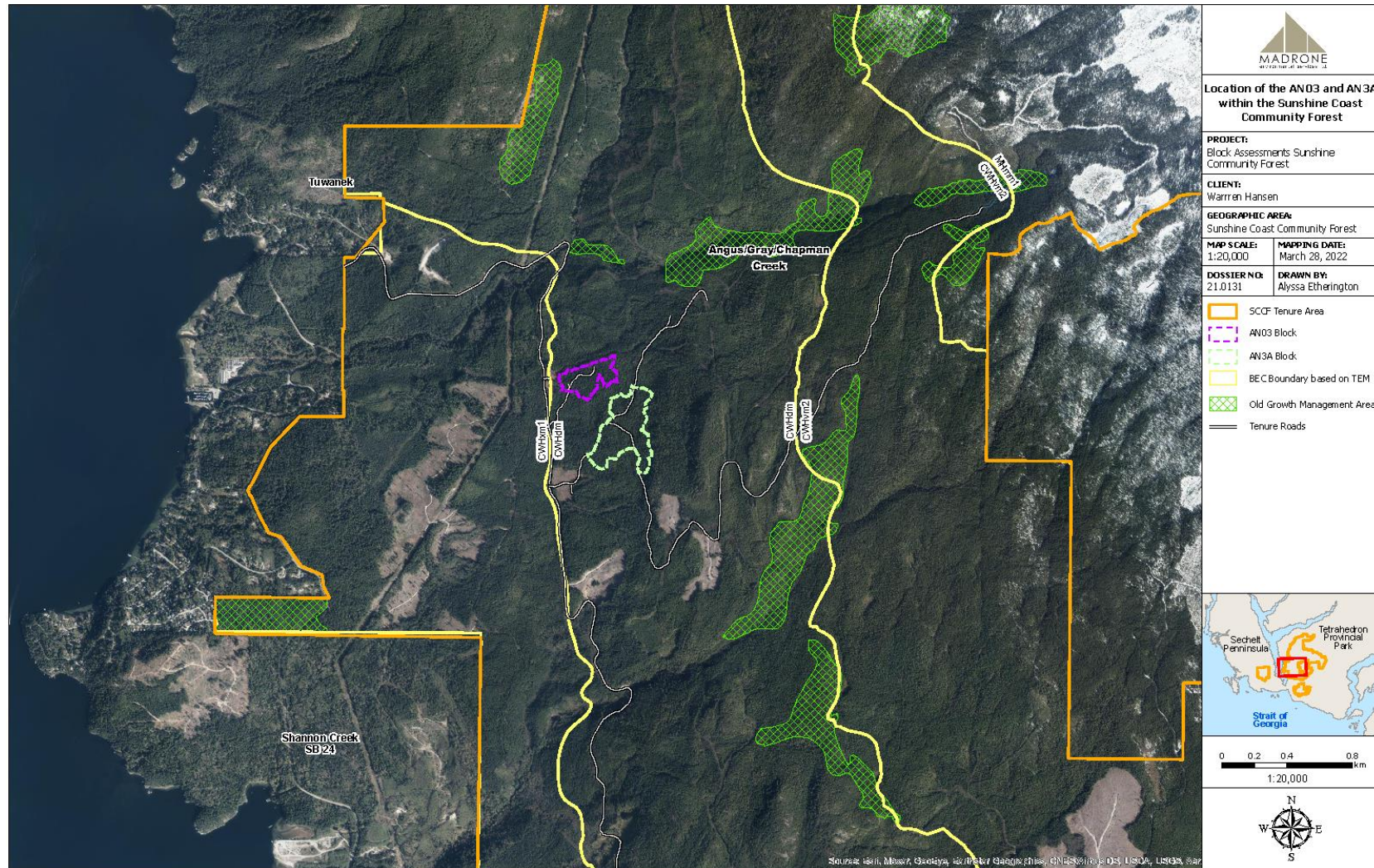
The main objectives of this assessment were to:

- 1) Assess the blocks for Old Forest and Sufficiently Established plant communities by noting their status and documenting their ecological condition in the field, and
- 2) Note instances of ecologically valuable resources in the stand, including any habitats for species of concern.

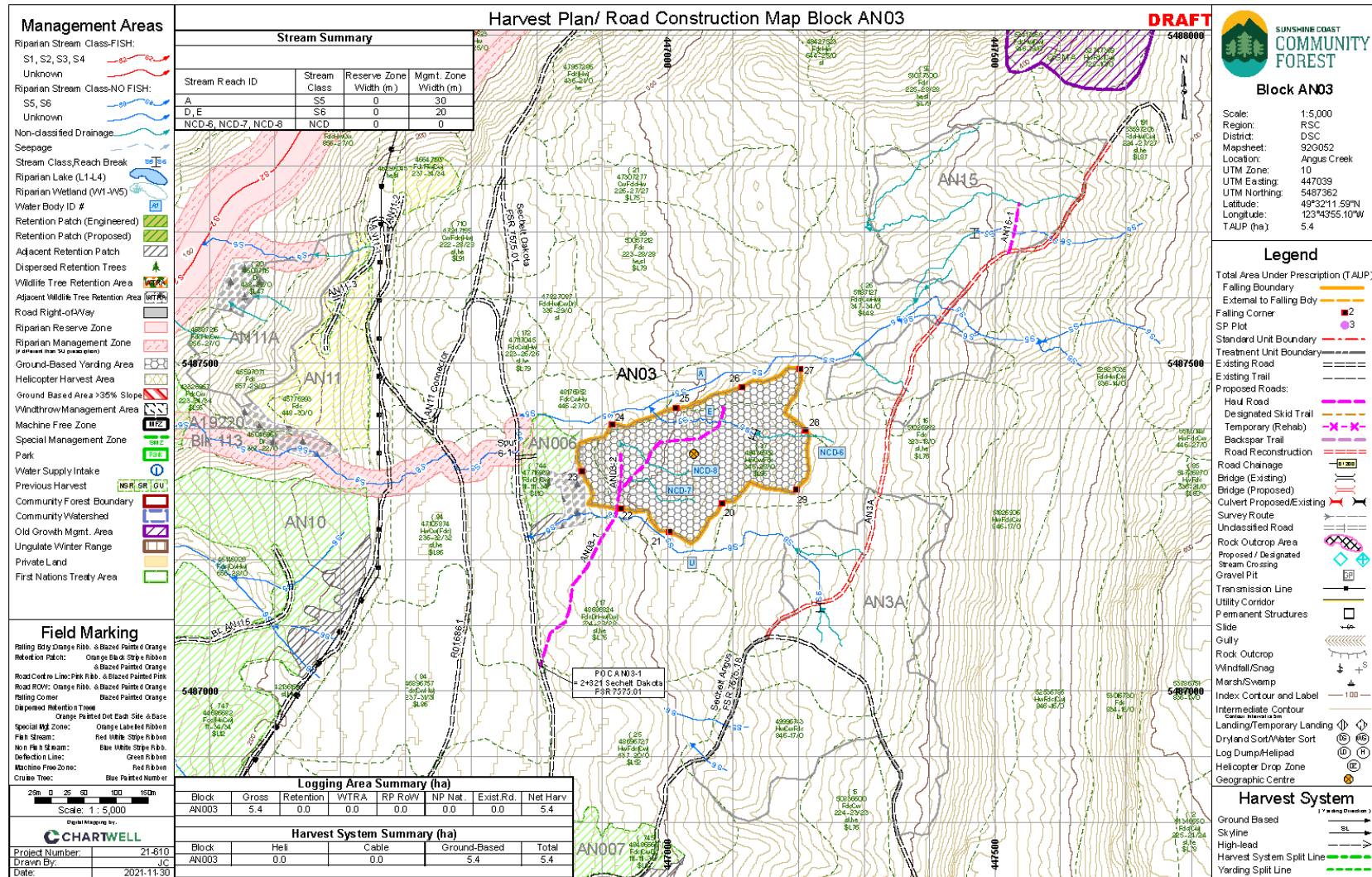
## **2 Overview of AN03 and AN3A**

Blocks AN03 and AN3A are in the Angus Creek operating area north of Sechelt, east of Tillicum Bay, and south of Gray Creek (**Figure 1**). The blocks are easily accessible via Dusty Road, an existing forest service road. **Figure 2** and **Figure 3** illustrate the initial proposed layout of AN03 and AN3A, respectively, as provided by SCCF in December 2021 prior to our assessment. The block boundaries in **Figure 2** and **Figure 3** have changed based upon the results of the draft of this ecological assessment. See **Figure 8** for the current layout for AN03. See **Figure 7** for block boundary amendments to AN3A and **Figure 9** for block AN3A's current layout.





**FIGURE 1: LOCATION OF AN03 AND AN3A WITHIN THE ANGUS CREEK OPERATING AREA OF THE SUNSHINE COAST COMMUNITY FOREST.**



**FIGURE 2: PROPOSED HARVEST PLAN OF AN03 AS PROVIDED BY SUNSHINE COAST COMMUNITY FOREST IN DECEMBER 2021. THE PROPOSED HARVEST PLAN WAS SUBSEQUENTLY CHANGED BASED UPON THE RESULTS OF THIS ECOLOGICAL ASSESSMENT.**

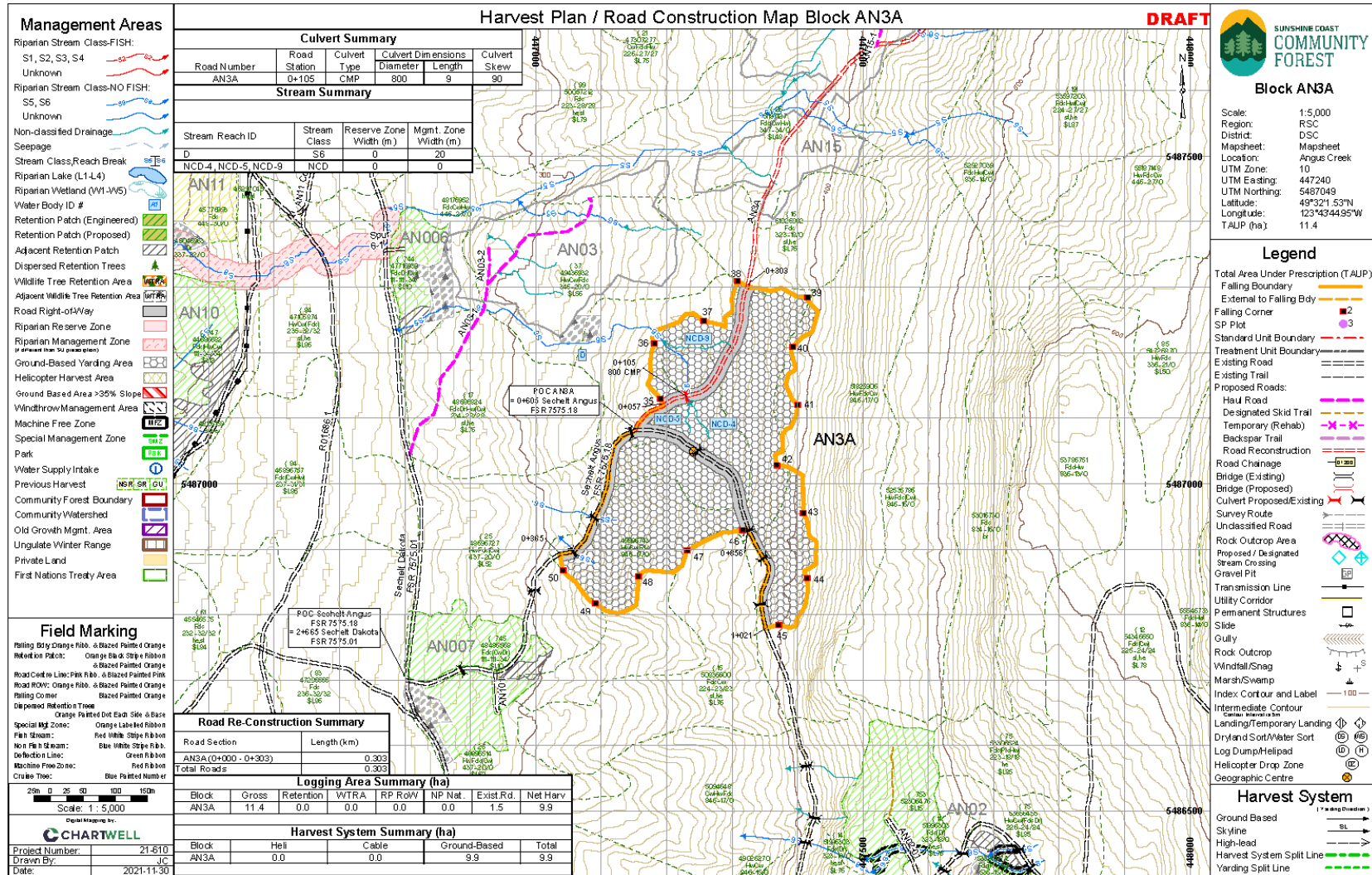


FIGURE 3: PROPOSED HARVEST PLAN OF AN3A AS PROVIDED BY SUNSHINE COAST COMMUNITY FOREST IN DECEMBER 2021. THE PROPOSED HARVEST PLAN WAS SUBSEQUENTLY CHANGED BASED UPON THE RESULTS OF THIS ECOLOGICAL ASSESSMENT.

### 3 Methods

To determine if there were any Old Forests and/or Sufficiently Established (SE) plant communities present and identify the condition of any red- and blue-listed plant communities (Listed Communities) that may be within the proposed cutblocks, we first conducted a desktop review of potential Listed Communities and Old Forest. We then used the methods from Land Management Handbook 72 ([LMH 72](#); Banner et al. 2019) to provide a decision framework for identifying suitably developed ecological communities for retention and conservation during our field assessment. To complete the field assessment, we walked both blocks evaluating the old forest characteristics and ecological integrity of the proposed blocks, identifying potential reserve areas and/or Wildlife Tree Retention Areas (WTRAs) that would help maintain forest structure and function.

Listed communities are identified by the BC CDC by the plant community and site series with different BEC units. In BC, outside of the GBR, for a listed ecological community to be present, “the characteristic vegetation and physiognomic structure must be present” (BC CDC 2022). This is typically interpreted by forest licensees as a forested ecological community is not red or blue-listed unless it is over 250 years old, mostly restricting protection of Listed Communities to old-growth stands. In the GBR, Listed Communities must be SE or Old Forest to require protection under the Great Bear Rainforest Order (Banner et al. 2019). Therefore, to apply conservation requirements one must first assess if a stand is considered Old Forest, and if not Old Forest, then SE, as outlined in *Guidelines to Support Implementation of the Great Bear Rainforest Order with Respect to Old Forest and Sufficiently Established Listed Communities* ([LMH 72](#); Banner et al. 2019). Listed communities that have not become sufficiently established or that do not have enough old forest characteristics to be considered Old Forest according to LMH 72 can still be ranked for their ecological characteristics using the guidebook’s methods. This can also help distinguish younger stands, that are not Old Forest or SE but have more ecological integrity and/or function than others for conservation purposes. This is especially useful where good examples of mature and Old Forest are not present or sufficient to maintain biodiversity. Where there is limited Old Forest or SE ecological communities, younger ecological communities that are not Old Forest or SE can be the best examples left and suitable for protection.

#### 3.1 Desktop Review

The purpose of the review was to determine the potential presence of provincially Red-Listed and Blue-Listed ecological communities. We used existing TEM mapping to identify the BEC unit and possible site series within AN03 and AN3A. Then searched the BC Conservation Data Centre (BC CDC) for Listed Communities within the CWHdm, where the blocks are located. We also reviewed potential Species-at-Risk occurrences and habitat within and surrounding the blocks.

The desktop review included following sources:

- BC Conservation Data Center (BC CDC: database for element occurrences).
- Terrestrial Ecosystem Mapping (TEM) for the Chapman Landscape Unit (BABID Number: 4677).
- [Sensitive Ecosystem Inventory](#) (SEI) for the Sunshine Coast and Adjacent Islands.
- Sunshine Coast Community Forest LiDAR Data – volume, height, and diameter models (Yuill 2015).
- Vegetation Resource Inventory (VRI; 2020).
- Cutblock BC<sup>1</sup> - previously harvested stands from multiple datasets (Consolidated Cutblock layer 2020).

We used the BC CDC to look for Element Occurrences (EO)<sup>2</sup> of Red Listed and Blue Listed ecological communities within and surrounding the blocks. The BC CDC's assessment system for EOs ranks them based on condition, size, and landscape context. Typically, EOs that contain Listed Communities of old forest which have higher scores for ecological integrity and quality. Younger ecological communities are Listed Communities but rank lower for ecological integrity and quality.

We identified four main species of concern with potential to be within AN03 and AN3A prior to fieldwork (**Table 1**). To do this, we generated an excel file with a list of potential species and ecosystems-at-risk within the area from the BC CDC database, we refined this using professional knowledge and habitat information from the BC CDC (Appendix A). From this list we further refined it to the four main species of concern.

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<sup>1</sup> Cutblock BC – BC Data Catalogue: <https://catalogue.data.gov.bc.ca/dataset/harvested-areas-of-bc-consolidated-cutblocks->

<sup>2</sup> An Element Occurrence of an ecological community is an area of land where an ecological community is present and should have practical conservation value for the community, it can represent a stand or patch of an ecological community, or a cluster of stands or patches of an ecological community (BC CDC 2022). An element occurrence is not an observation but the results from an assessment of observations for conservation significance, and includes verification of the information source (BC CDC 2022, for more on EOs see <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/known-locations-of-species-and-ecosystems-at-risk/mapping-methods/cdc-element-occurrences>).

**TABLE 1. MAIN SPECIES OF CONCERN IDENTIFIED PRIOR TO FIELDWORK AND THEIR BC LIST STATUS AND PROVINCIAL CONSERVATION STATUS (PCS) FROM THE BC CDC (2022).**

Common Name	Scientific Name	BC List	PCS Status Rank	PCS - Status Rank Meaning
Northern goshawk	<i>Accipiter gentilis laingi</i>	Red	S2	Imperiled
Northern red-legged frog	<i>Rana aurora</i>	Blue	S3	special concern, vulnerable to extirpation or extinction
Roosevelt elk	<i>Cervus elphus roosevelti</i>	Blue	S3S4	special concern, vulnerable to extirpation or extinction to apparently secure
Western screech-owl	<i>Megascops kennicottii kennicottii</i> ,	Blue	S2S3	Imperiled/of special concern, vulnerable to extirpation or extinction

Northern goshawks, northern red-legged frogs, Roosevelt elk, and western screech-owl are ranked by the BC CDC (2015) as [S3S4](#) (of special concern, vulnerable to extirpation or extinction to apparently secure) and are provincially [Blue-Listed](#) (of Special Concern). Although elk are considered recovered over much of the Sunshine Coast (BCMFLNRO 2015), the Rainy/Gray population is just ‘at’ or perhaps still ‘slightly below’ population targets, although populations are increasing; key issues are maintaining riparian forests (Reynolds pers. comm. 2021) and sufficient mature and old forest.

Surveying for all possible SAR was beyond the scope of this assessment. However, we did consider the general habitat requirements of species listed in Appendix A while identifying important habitat attributes during our field assessment.

### 3.2 Field Assessment

Following the completion of the desktop background review, we conducted the first field assessment to identify Sufficiently Established (SE) plant communities and Old Forest using methods outlined in [LMH 72](#) (Banner et al. 2019). In December 2021, we walked the falling boundary of AN03 and AN3A as well as through the blocks to assess stand characteristics in relationship to the entire block area. We noted areas of potential ecological considerations and areas of ecological heterogeneity while looking for areas with old-growth attributes such as Veteran Overstory Trees (VOTs), well developed understory, and Coarse Woody Debris (CWD). In areas where there appeared to be more old forest attributes than other areas within the blocks, we used fixed-area plots of 0.2 ha (25-m radius) to assess the Forest Attribute Score (FAS; Banner et al. 2019, p.32). GPS locations of each assessment plot were taken along with north, south, east, and west photos using an iPad and Avenza.

We started each plot by completing an Old Forest decision key (Banner et al. 2019, p.27), then a SE plant community key (Banner et al. 2019, p.30) and then calculated the FAS to determine the ecological condition of the plot. Both keys provide a decision (if protection would be required in the Great Bear Rainforest Order area) or direct the user to complete a FAS based on features typical of older forests. Although the block is not in the Great Bear Rainforest (GBR), this methodology provides a consistent, systematic approach to evaluate the block’s structural attributes and ecological attributes. Calculating the

FAS provides a numerical score of how close a stand is to Old Forest/SE condition, thus allowing us to rank stands in relation to their usefulness for recruitment to Old Forest and suggest special management or conservation measures. Stands with higher FAS scores, even if not SE or old, may be the best opportunities left for recruitment to old forest. The Old Forest decision key helps determine if the forest within the plot is functioning as Old Forest. The SE plant community key is used to determine if a Listed Community would meet the Great Bear Rainforest Order requirements for a SE plant community. To be considered a Sufficiently Established a stand must be Old Forest or be greater than 80 years old and meet some basic structural and vegetation development requirements (e.g., complex, open stand structure and developed understory).

Key attributes in the Old Forest and Sufficiently Established assessments are stand age, number of VOTs and the FAS. The following site variables were scored at each plot for the FAS:

- Density of VOTs
- Snag Density
- Vertical Canopy differentiation
- Understory shrub and herb cover
- Coarse woody debris presence
- Disturbance history

LMH 72 requires site level assessments of stand attributes and knowledge of the overall age of the stand. We used the most recent VRI data<sup>3</sup> to determine the age matrix of the block. We also used an increment bore to core two trees at each plot, a dominant and matrix tree, to estimate stand age.

A second informal block assessment was done on June 16<sup>th</sup> 2023 when members of SCCF staff, summer students, Laurie Kremsater and Anna Yuill walked AN3A again. The revisit was in response to an email from the public expressing concern that areas of the block had potential to be Old Forest.

## 4 Results

### 4.1 Desktop Review – Potential Listed Communities

The existing TEM for the Chapman Landscape Unit identified three potential existing ecological communities, or site series, within AN03 and AN03A (**Table 2**). In both blocks the dominant site series was the zonal 01 – Western Hemlock – Flat moss (*Tsuga heterophylla* / *Buckiella undulata*). Both blocks also potentially had a minor component of site series 05 – Western Redcedar – Sword fern Dry Maritime (*Thuja plicata* / *Polystichum munitum* Dry Maritime). AN3A also potentially had a minor component of site

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<sup>3</sup> VEG\_COMP\_LYR\_R1\_POLY\_2020

series 03 – Douglas-fir Western Hemlock – Salal Dry Maritime (*Pseudotsuga Menziesii* - *Tsuga heterophylla* / *Gautheria shallon* Dry Maritime).

**TABLE 2: MAPPED ECOSYSTEMS WITHIN BLOCK AN03 AND AN3A ACCORDING TO CHAPMAN LANDSCAPE UNIT TERRESTRIAL ECOSYSTEM MAPPING (BAPID 4677).**

BEC Unit	Site Series	Ecosystem Name	Potential Listed Community <sup>4</sup>
CWHdm	01	Western Hemlock / Flat moss	Blue
	03	Douglas-fir – Western Hemlock / Salal Dry Maritime	Red
	05	Western Redcedar / Sword fern Dry Maritime	Red

According to VRI<sup>3</sup> and RESULTS<sup>5</sup> data, AN03 has a harvest history and is approximately 60 years old and AN3A was harvested in the early 1950's is approximately 70 years old. The VRI and the 'consolidated cutblock BC data' do not align in this area, with VRI indicating older age classes where cutblock BC indicates previous harvest (**Figure 4**). Along the eastern boundary of AN3A the VRI data shows an older forest (PROJ\_AGE\_1 = 167) overlapping the block boundary. However, the VRI age line is inaccurate, and the field layout has avoided this older forest type (see Field Results, below).

The Sensitive Ecosystem Inventory (SEI) showed a mapped riparian fringe ecosystem with minor overlaps along the northwestern boundary and southwestern boundary of AN03 buffering the mapped S5 and S6 streams.

<sup>4</sup> Retrieved from the BC CDC March 2022.

<sup>5</sup> RESULTS data – BC Data Catalogue: <https://catalogue.data.gov.bc.ca/dataset/results-openings-attribute-only>.





**FIGURE 4: PROJECTED AGE CLASSES FROM VRI AND PREVIOUSLY HARVESTED AREA (YELLOW HATCH; CUTBLOCK BC<sup>6</sup>) OVERLAPPING AN3A.**

<sup>6</sup> Cutblock BC – BC Data Catalogue: <https://catalogue.data.gov.bc.ca/dataset/harvested-areas-of-bc-consolidated-cutblocks->

## 4.2 Field Results

The blocks are dominated by Douglas-fir and western redcedar with some western hemlock and a minor component of western white pine (*Pinus monticola*). The understory within the blocks was generally sparse to patchy, with some well-developed areas excluded from the block. The shrub layer in the site series preset is characterized by salal (*Gaultheria shallon*), red huckleberry (*Vaccinium parvifolium*) and dull Oregon-grape (*Mahonia nervosa*). The herb layer was also not well-developed. The herb layer would typically consist of sword fern (*Polystichum munitum*) with minor components of bracken fern (*Pteridium aquilinum*).

AN03 had more Douglas-fir and western white pine than AN3A, but still had a strong redcedar component. The block boundary between Falling Corner (FC) 24 and 25 was below the slope break on the riparian edge. There were also more large trees present in this area marked for retention but were not VOTs. Layout had changed from the time the map was created and we were in the field, an area from FC29 to FC20 was excluded dipping into the block to a new FC30. This excluded area had a well-developed understory, larger redcedar and Douglas-fir (80 cm to 100 cm DBH) but likely not old enough to be VOTs.

AN3A excludes a trail and more diverse bluff area with larger Douglas-fir and redcedar. From approximately FC39 to FC44, the falling boundary follows a type-change, with older more complex forest outside of the block and previously harvested area within the block. The block has been previously harvested but there also may have been fire origin in some portions.

### 4.2.1 Assessment of Old or Sufficiently Established Communities using LMH 72

Following the methods from LMH72 to determine Old Forest and SE, none of the plots in the blocks met the criteria for Old Forest or SE. Where we conducted our plot assessments the stands lacked VOTs to be classified as Old Forest and did not pass the FAS to be considered SE (**Table 3**).

Estimated stand age of the matrix was roughly 50 – 80 years (**Table 5**), similar to the ages from the desktop review (AN03 was estimated to be 60 years old and AN3A 70 years old by consolidated cutblock data). There is a cohort of larger dominant trees in the stand that we cored to determine if they were VOTs. This older cohort ranged from approximately 150 – 180 years old (**Table 5**). To be considered Old Forest and therefore a SE Listed Community, the plots would have needed 15 VOTs over 200 years old per hectare or passed the FAS since the older cohort is  $\geq 140$  years. A stand  $\geq 80$ -years-old is considered Old Forest and SE if it has  $\geq 20$  VOTs per hectare or SE only if it has a well-developed understory and passes the FAS (Banner et al. 2019). None of the plots passed the FAS and the most VOTs per hectare calculated for a plot were  $\leq 10$ /ha (a total of one of two VOTs in a 0.25 ha plot, see plot

AG04 in block AN03). Overall, the understory in AN03 and AN3A was not well-developed, and the blocks had few snags or CWD with simple to moderate vertical canopy differentiation.

We subjectively put our plots in the areas most likely to be able to pass the FAS score (**Table 3** and **Table 4**). None of the five plots within the two blocks passed the FAS while the plot in the older forest outside the block passed. It should be noted that some subjectivity will always be required in any field assessment determining a FAS, thus we err on the side of caution making ecologically conservative decisions in our scoring of the plots by giving them higher scores if categories were not obvious (e.g., choosing 'some' versus 'few' pieces of CWD if the plot was in between those categories, or choosing 'natural' versus 'harvest disturbance' if the history at the plot was unclear).

- AG01 and AG02 had no VOTs or snags, a simple canopy, and few to no pieces of CWD. AG01 had a sparse understory and AG02 had a patchy understory. Neither are Old Forest or SE.
- AG03 had no VOTs or snags, some CWD and a sparse to patchy understory, it is not Old Forest or SE.
- AG04 and AG05 scored the highest FAS out of the all the plots in the block (3.5 and 4, respectively), however they did not pass (pass > 6). AG04 had two VOTs, moderate vertical canopy differentiation and some CWD. AG05 had one VOT, moderate vertical canopy differentiation and a well-developed understory.
- Plot1 (during the revisit in 2023) had a FAS of 3.5 with 1 VOT, 1 snag, patchy understory, a moderately complex overstorey, few down wood and intensive harvest history. A hemlock was cored at 41 years old and the larger Douglas-fir in the plot was cored at 132 years old.
- Plot2 (during the revisit in 2023), which is outside the block, passed the FAS with a score of 6.5. It had two VOTS, 1 less than a metre DBH and 1 more than a metre DBH, one snag, a moderately complex overstorey, some down wood and intensive harvest history mixed with fire origin. No cores were taken in Plot 2.
- A 'rapid FAS' (less the vegetation inventory and no tree coring) was conducted in various spots during the revisit informal assessment in 2023. The highest score, near the large, decayed cedar labelled potential CMT in **Figure 5**, scored a 4 based on 1 VOT, 2 Snags, complex overstorey, sparse understory and some down wood.

Field assessments confirm the 'consolidated cutblock layer' is accurate and the blocks had previously been harvested and do not include the age class 8 indicated in the VRI. The surrounding older forest is not included in the block and is suggested for inclusion in reserve network (see Recommendations).

Representative site photos of each plot for the December 2021 survey are in Appendix B.

**TABLE 3: POINTS FOR EACH CATEGORY OF THE FOREST ATTRIBUTE SCORE (FAS) FOR EACH PLOT AND TOTAL FAS WITHIN AN03. SCORING IS BASED ON A POINTS SYSTEM AS DESCRIBED BY LAND MANAGEMENT HANDBOOK 72.**

Survey Date	Plot	Density of VOTs	Density of Snags <sup>7</sup>	Vertical Canopy Differentiation	Understory Shrub and Herb Cover	CWD pieces <sup>8</sup>	Disturbance History	Score	Pass/Fail
12/ 2021	AG03	0.0	0.0	0.0	1.0	0.5	0.0	1.5	Fail
12/ 2021	AG04	2.0	0.0	1.0	0.0	0.5	0.0	3.5	Fail
12/ 2021	AG05	0.5	0.0	1.0	2.0	0.5	0.0	4.0	Fail

**TABLE 4. POINTS FOR EACH CATEGORY OF THE FOREST ATTRIBUTE SCORE (FAS) FOR EACH PLOT AND TOTAL FAS WITHIN AN3A. SCORING IS BASED ON A POINTS SYSTEM AS DESCRIBED BY LAND MANAGEMENT HANDBOOK 72.**

Survey	Plot	Density of VOTs	Density of Snags <sup>7</sup>	Vertical Canopy Differentiation	Understory Shrub and Herb Cover	CWD pieces <sup>8</sup>	Disturbance History	Score	Pass/Fail
06/ 2021	AG016	0.0	0.0	1.0	0.0	0.0	1.0	2.0	Fail
12/ 2021	AG01	0.0	0.0	0.0	0.0	0.5	0.0	0.5	Fail
12/ 2021	AG02	0.0	0.0	1.0	1.0	0.5	0.0	2.5	Fail
06/ 2023	Plot1	0.5	1	1	1	0	0	3.5	Fail
06/ 2023	Plot2*	2.5	1	1	1	0.5	0.5	6.5	Pass
06/2023	Rapid FAS	0.5	1	2	0	0.5	0	4	Fail

\* Plot 2 was outside of the AN3A block boundary and represents an area of older forest that will be put in conservation network.

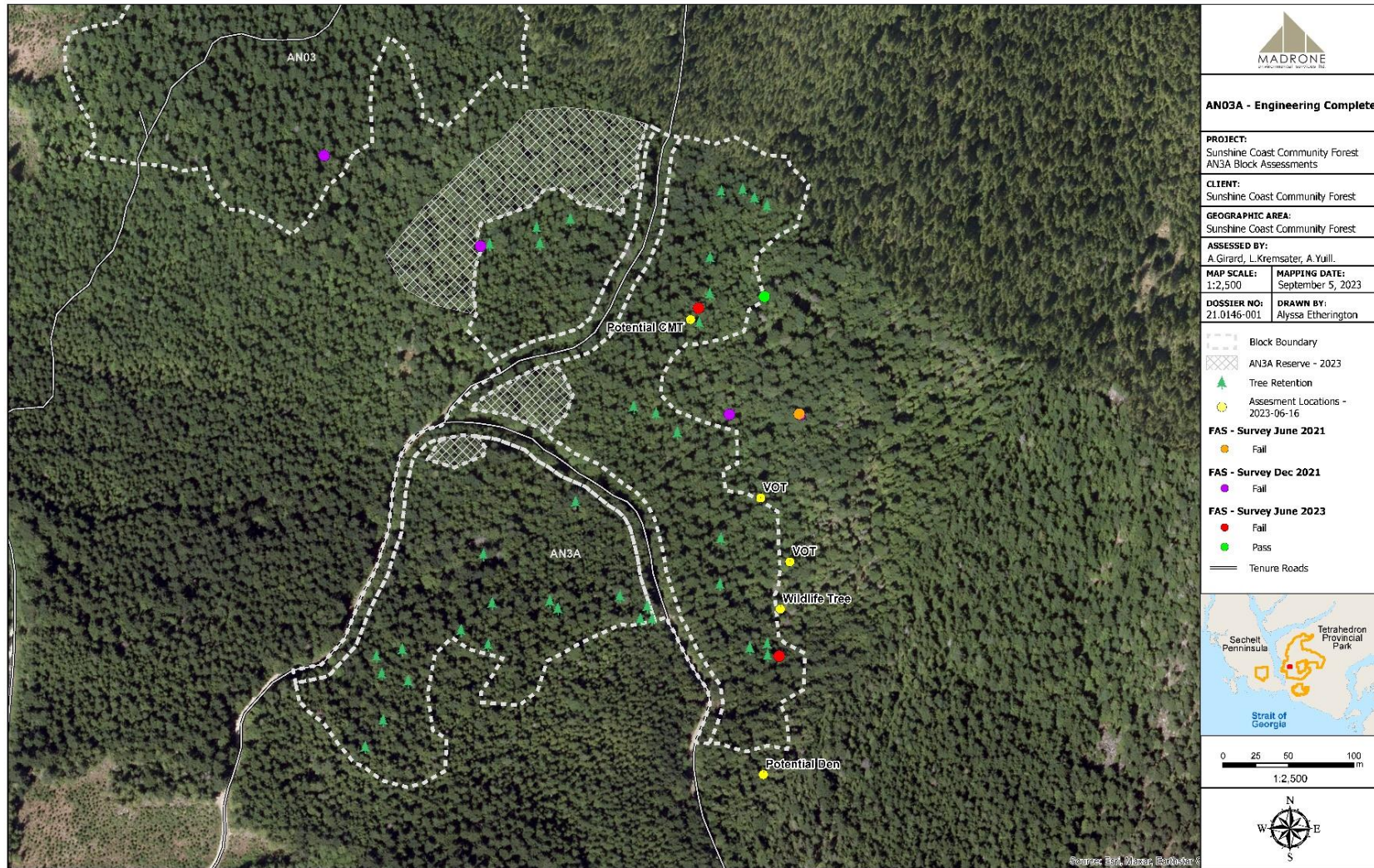
**TABLE 5: DIAMETER AND ESTIMATED AGE OF DOMINANT AND MATRIX TREES CORED WITHIN FAS PLOTS IN BLOCKS AN03 AND AN3A.**

Block	Plot	Species	DBH (cm)	Age (years)
ANO3A	AG01	Redcedar	70	170
		Douglas-fir	-	47
	AG02	Western hemlock	26	115
		Douglas-fir	56	156
	AG016*	Douglas-fir	81	143
Western hemlock		39	151	
AN03	AG03	Douglas-fir	48	56
	AG04	Douglas-fir	88	180
	AG05	Douglas-fir	42	75

\* AG016 is from the June 2021 overall tenure survey and is outside of AN3A.

<sup>7</sup> Snags  $\geq$  50 cm DBH and 5 m tall (Banner et al. 2019).

<sup>8</sup> CWD  $\geq$  50 cm DBH and 10 m in length.



**FIGURE 5: PLOT LOCATIONS WHERE FOREST ATTRIBUTE SCORES WERE ASSESSED IN BLOCKS AN03 AND AN3A.**

We reviewed the Ministry of Environment (2006) and Appendix 7 of LMH 72 to understand the EO ranking of AN03 and AN3A based upon draft materials from the CDC. AN03 is approximately 5 ha and AN3A is approximately 11 ha. AN03 is surrounded by a mosaic of early to mature-seral stands with a riparian corridor on its northern boundary. AN3A is also surrounded by early to mature-seral stands but is also bordered by Old Forest to the east. There are no existing OGMAs or parks within the surrounding area to form large corridors and no riparian areas to help promote a riparian corridor. Overall, according to CDC criteria, both blocks are in fair condition and have good landscape context. AN03's size rated as a C and AN3A as a B (**Table 6**).

**TABLE 6: OVERVIEW OF INFLUENCING FACTORS OF ECOLOGICAL INTEGRITY AND THEIR OVERALL RANKING BASED ON APPENDIX 7 OF LMH 72 FOR AN03 AND AN3A.**

Block	Influencing Factors of Ecological Integrity		
	Condition	Landscape Context	Size
AN03	Fair	Good	C
AN3A	Fair	Good	B

#### 4.2.2 Wildlife Observations

In AN03, we saw bear climbing marks on a tree near FC28 and we found a potential den in a redcedar by FC45 in AN3A. We looked for Northern Goshawk nests but didn't see any, we did not do call playbacks. We did not do an evening owl census but have heard from a local naturalist that Western Screech-owls have not been heard nor observed in the area for many years. There were a few lightly used ungulate trails.

## 5 Discussion

Old-growth forests are considered good to excellent examples of Listed Communities when they reflect the best conditions of an ecological community. Due to existing harvesting pressures and historical logging, old-growth forests can be rare, especially at low elevations, including in the CWHdm. Where there is insufficient old growth to meet conservation targets younger forests may need to fill the gap. For use in the GBR, LMH72 was created to provide criteria to help determine if younger stands (< 250 years) should be considered Old Forest or Sufficiently Established Listed Communities to meet conservation requirements. Even though the SCCF is not within the GBR, the methods and principals outlined by LMH72 still hold merit as they evaluate a stand based on the structure and development of an ecological community as well as stand age. Additionally, the FAS provides a quantitative evaluation of the value of a stand as recruitment to Old Forest conditions.

Deciding if a block is a suitable candidate for adding to a reserve network aimed at protecting and recruiting Old Forest requires knowing other recruitment options are available to meet the conservation targets the SCCF plans to implement. The broader tenure-wide assessment that identified potential recruitment areas, including in the CWHdm, was completed in 2021 with a proposed reserve network (Yuill et al. 2021). That assessment focused stands most likely to have old forest attributes in the CWHxm and dm and thus was not an exhaustive assessment of all stands throughout the tenure. Since that time the proposed reserve network has been revised and the SCCF continues to add or exchange components of the reserve network as new suitable areas are found. AN03 and AN3A were not assessed during that 2021 project because they were not selected as priority areas likely to have old forest attributes.

Based on our assessment of AN03 and AN3A they are not recommended to be added to the reserve network. Their structural attributes and ecological communities have not developed sufficiently to function like an Old Forest or to be considered SE. They have sparse to patchy understory with few VOTs, snags, or pieces of CWD. However, outside the falling boundary of AN3A to the east was forest that had a more complex canopy, VOTs, snags, CWD, and well-developed understory. The forest was appropriately excluded from the block and should be added to the conservation network or other long-term retention. We also saw other smaller examples of more complex forest in patches outside of AN3A by FC35 and outside of AN03 near FC29, which should be stand-level retention. Within each block are areas of higher complexity or ecological anchors that also would be useful as stand-level retention.

These blocks are fair examples of forest condition, there are better examples of Old Forest adjacent to the blocks where more complex forest can be included in the conservation network to contribute to ecosystem function. Retention patches in the block will help maintain older forest characteristics and add ecological function as it regenerates. Additionally, there are several leave trees marked for in block retention; most of those trees are not old but nonetheless chosen to add structural complexity and increase function of the next stand as it grows after harvest.

## 6 Conclusion and Recommendations

Our assessment of blocks AN03 and AN3A found that the forested ecosystems within the blocks are not structurally developed enough to be considered Old Forest or Sufficiently Established. We noted ecologically valuable features such as a potential den and some larger trees that could be included as retention as well as Old Forest outside AN3A. Overall, the blocks are in fair ecological condition (**Table 6**) with good landscape context. The block layout excluded the most ecologically valuable features (e.g., VOTs) and Old Forest which can be added to the conservation network. Additionally, block layout has included several patches and leave trees which will diversify stand structure and increase ecosystem function and may develop into VOTs over time.

Blocks AN03 and AN3A are not strong candidates for adding to a reserve network, however some of the features within them and surrounding them are good components to capture within stand level retention and the conservation network. We recommend the following block revisions to avoid harvesting ecologically important features and suggest areas to be considered for stand level retention:

### AN03

- Moving the north-northwest boundary to the top of break outside to avoid the riparian sensitive ecosystem and adding the riparian corridor to a Wildlife Tree Retention Area (WTRA) for long-term retention.
  - Completed – boundary changed.
- Moving the boundary to exclude a large redcedar between station 21.5 and FC22, although not old, this tree can contribute to stand structure and function in place of VOTs.
  - Completed – redcedar was marked as a leave tree (between FC32 and FC33; **Figure 8**).

### AN3A

- Moving the block boundary to exclude a potential bear den near FC45.
  - Completed – FC45 moved to excluded potential den.
- Adding the forest outside of the eastern boundary, from FC39 to FC45 to long-term retention or the reserve network, with priority given to the area from FC39 to FC41.
  - Completed – this area is not in the block and will be put in long term retention as part of the reserve network.
- Moving the boundary to exclude a larger western hemlock with good habitat value near FC43, however it has mistletoe so removing it during harvest may be prudent for forest health reasons.
  - Completed – boundary moved to exclude single western hemlock tree for habitat values.
- Adding a patch of mature Douglas-fir near FC35 to long-term retention, though lower priority than previous areas recommended for retention.
  - Completed – added to an Old Growth Recruitment stewardship area.

**Figure 6** indicates approximate areas for reserves based upon the FAS and ecological condition of these area, however, the actual boundaries of these areas will need to be refined in the field. **Figure 7** and the final block layouts in Appendix C indicate that SCCF addressed the recommendations above.



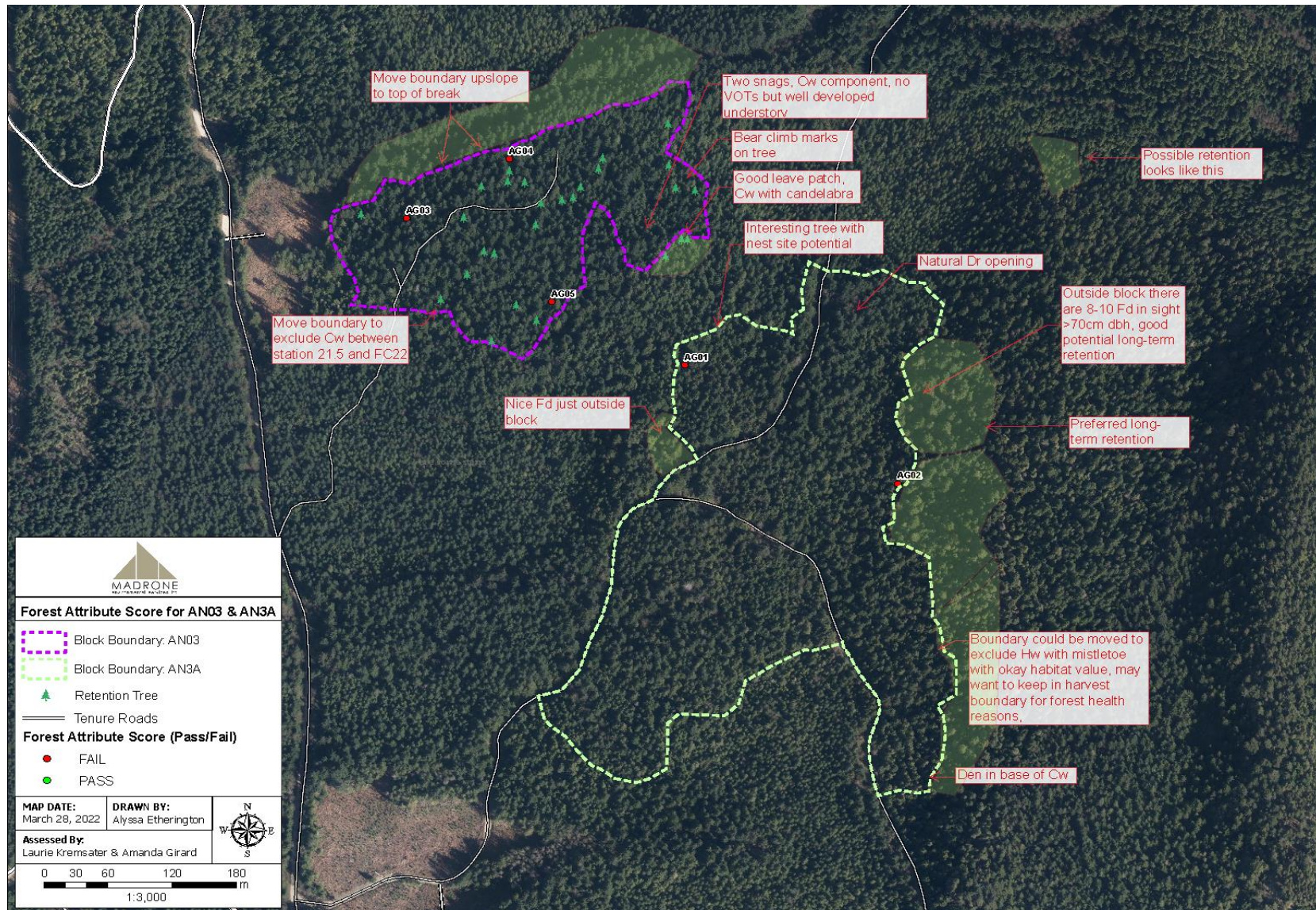
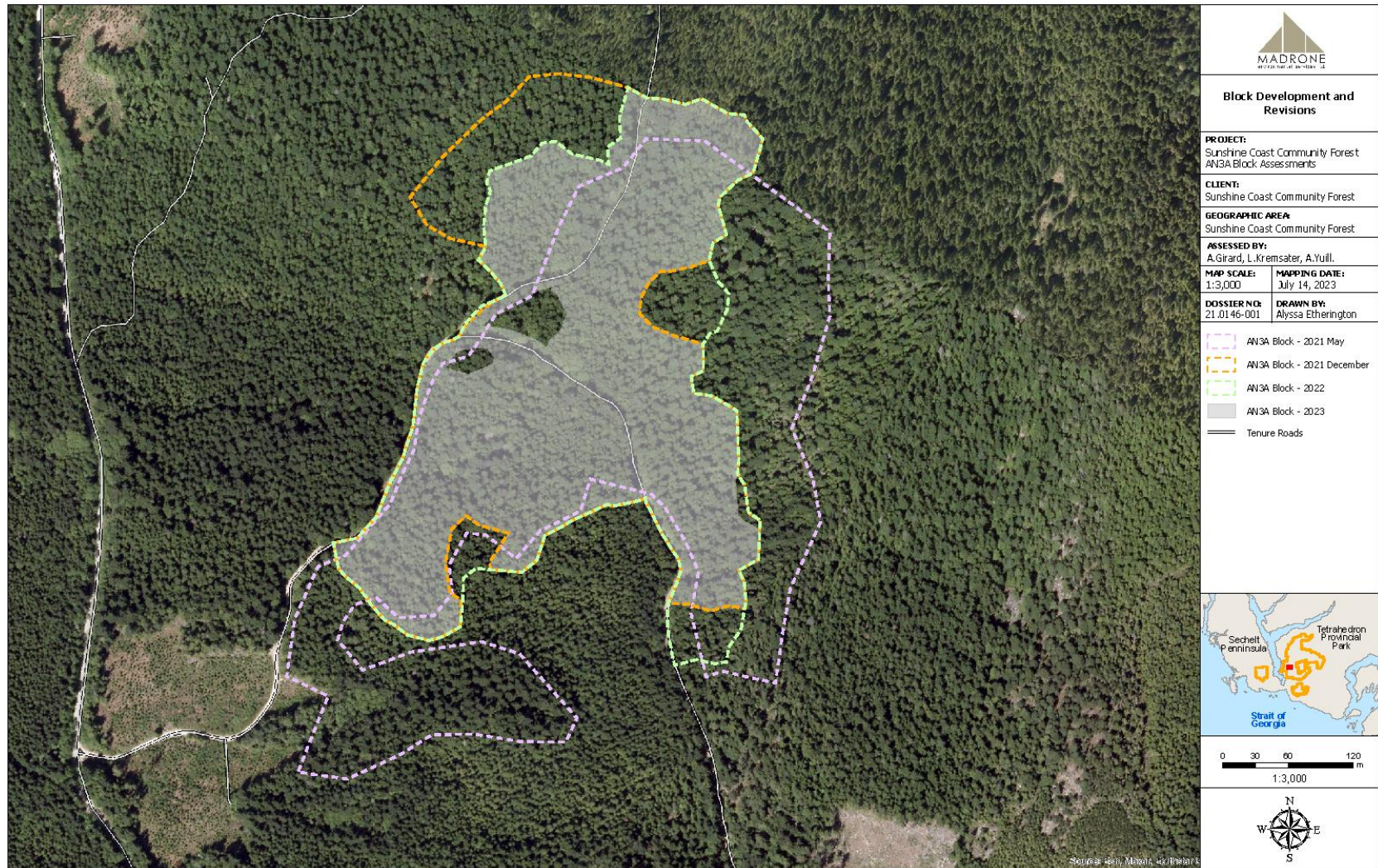


FIGURE 6: POTENTIAL RETENTION AREAS AND ECOLOGICAL FEATURES NOTED IN FIELD ASSESSMENT.

## 7 Addendum

The block boundary has changed many times over the span of the various assessments (ecological, geotechnical and archaeological). **Figure 7** shows the evolution of the block boundary over time, including changes made based on recommendations from early drafts of this report and the informal block walk done in June 2023.

We revisited the block as an informal block walk to ensure that nothing was missed in terms of key ecological features in AN3A. That revisit did not change the main recommendations – the Old Forest is outside the block and the areas in the block with the few remaining older trees do not pass the FAS. We flagged a large old cedar to be considered for retention, that was not found in the first assessment (SCCF normally retains all older trees even if they are not 200 years old nor in a plot that passes the FAS). As well, two potential Pileated Woodpecker nest cavities were found during the June 2023 informal block walk and the block boundary was adjusted to avoid these. Recent changes (implemented after the first block walk) to the Migratory Bird Act require Pileated Woodpecker nests to be protected for at least three years after they have been active. **Figure 10** in Appendix D maps notes and findings from the revisit.



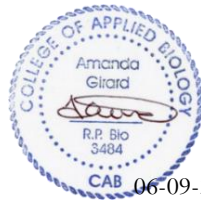
**FIGURE 7: BLOCK BOUNDARY AMENDMENTS BASED ON RECOMMENDATIONS FROM EARLIER DRAFTS OF THIS REPORT AND THE INFORMAL BLOCK WALK AND ENGINEERING CONSIDERATIONS.**

## 8 Signatures

### MADRONE ENVIRONMENTAL SERVICES LTD.

Prepared by:

*\*This is a digitally signed duplicate of the  
official manually signed and sealed document*

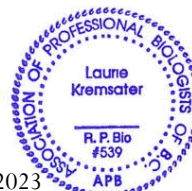


06-09-2023

**Amanda Girard**

M.R.M., R.P.Bio, R.P.F.

*This is a digitally signed duplicate of the  
official manually signed and sealed document*



06-09-2023

**Laurie Kreamsater**

M.Sc., R.P.Bio., R.P.F.

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## APPENDIX A

# Species & Ecosystems Explorer Results

The following is a list of red- or blue- listed species and ecological communities that have potential to be present within AN03 and AN3A. To identify species and ecological communities at risk, a search of the BC Species & Ecosystem Explorer was performed (December 2021). Search results were evaluated based on expert knowledge and the habitat noted on the BC CDC. Results pertaining to ray-finned, fish, and bivalves were removed from the search results due to a lack of significant watercourses throughout AN03 and AN3A.

English Name	Scientific Name	Class (English)	BC List	Provincial FRPA	SARA Status
<b>Vertebrates</b>					
Grizzly bear	<i>Ursus arctos</i>	Mammals	Blue	Y	Special Concern
Little brown myotis	<i>Myotis lucifugus</i>	Mammals	Yellow		Endangered
Long-tailed weasel, altifrontalis subspecies	<i>Mustela frenata altifrontalis</i>	Mammals	Red		
Mountain beaver	<i>Aplodontia rufa</i>	Mammals	Yellow		Special Concern
Mountain goat	<i>Oreamnos americanus</i>	Mammals	Blue		
Olympic shrew	<i>Sorex rohweri</i>	Mammals	Red		
Pacific water shrew	<i>Sorex bendirii</i>	Mammals	Red	Y	Endangered
Roosevelt elk	<i>Cervus elaphus roosevelti</i>	Mammals	Blue		
Southern red-backed vole, occidentalis subspecies	<i>Myodes gapperi occidentalis</i>	Mammals	Red		
Snowshoe hare, washingtonii subspecies	<i>Lepus americanus washingtonii</i>	Mammals	Red		Critically Imperiled
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Mammals	Blue		
Townsend's mole	<i>Scapanus townsendii</i>	Mammals	Red		Endangered
Trowbridge's shrew	<i>Sorex trowbridgii</i>	Mammals	Blue		
Wolverine, <i>luscus</i> subspecies	<i>Gulo gulo luscus</i>	Mammals	Blue		Special Concern
Yuma myotis	<i>Myotis yumanensis</i>	Mammals	Yellow		
American bittern	<i>Botaurus lentiginosus</i>	Birds	Blue		Special Concern

English Name	Scientific Name	Class (English)	BC List	Provincial FRPA	SARA Status
Ancient murrelet	<i>Synthliboramphus antiquus</i>	Birds	Blue	Y	Special Concern
Band-tailed pigeon	<i>Patagioenas fasciata</i>	Birds	Blue		Special Concern
Black Swift	<i>Cypseloides niger</i>	Birds	Blue		Endangered
Black-throated green warbler	<i>Setophaga virens</i>	Birds	Blue	Y	
Canada warbler	<i>Cardellina canadensis</i>	Birds	Blue		Threatened
Common nighthawk	<i>Chordeiles minor</i>	Birds	Yellow		Threatened
Evening grosbeak	<i>Coccothraustes vespertinus</i>	Birds	Yellow		Special Concern
Lewis's woodpecker	<i>Melanerpes lewis</i>	Birds	Blue		
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Birds	Blue	Y	Threatened
Northern goshawk, <i>laingi</i> subspecies	<i>Accipiter gentilis laingi</i>	Birds	Red	Y	Threatened
Olive-sided flycatcher	<i>Contopus cooperi</i>	Birds	Blue		Threatened
Peregrine falcon, <i>anatum</i> subspecies	<i>Falco peregrinus anatum</i>	Birds	Red		Special Concern
Peregrine falcon, <i>pealei</i> subspecies	<i>Falco peregrinus pealei</i>	Birds	Blue		Special Concern
Purple martin	<i>Progne subis</i>	Birds	Blue		
Rusty blackbird	<i>Euphagus carolinus</i>	Birds	Blue		Special Concern
Short-eared owl	<i>Asio flammeus</i>	Birds	Blue	Y	Special Concern
Spotted owl	<i>Strix occidentalis</i>	Birds	Red	Y	Endangered
Western screech-owl, <i>kennicottii</i> subspecies	<i>Megascops kennicottii kennicottii</i>	Birds	Blue		
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Birds	Red		
Yellow-breasted chat	<i>Icteria virens</i>	Birds	Red	Y	Endangered
Coastal giant salamander	<i>Dicamptodon tenebrosus</i>	Amphibians	Blue	Y	Threatened
Coastal tailed frog	<i>Ascaphus truei</i>	Amphibians	Yellow	Y	Special Concern



English Name	Scientific Name	Class (English)	BC List	Provincial FRPA	SARA Status
Northern red-legged frog	<i>Rana aurora</i>	Amphibians	Blue	Y	Special Concern
Western toad	<i>Anaxyrus boreas</i>	Amphibians	Yellow		Special Concern
Northern painted turtle - Pacific Coast population	<i>Chrysemys picta</i> pop. 1	Reptile	Red		Endangered
<b>Invertebrates</b>					
Dusky fossaria	<i>Galba dalli</i>	Gastropods	Blue		
Meadow rams-horn	<i>Planorbula campestris</i>	Gastropods	Blue		
Oregon forestsnail	<i>Allogona townsendiana</i>	Gastropods	Red		Endangered
Prairie fossaria	<i>Galba bulimoides</i>	Gastropods	Blue		
Pygmy fossaria	<i>Galba parva</i>	Gastropods	Blue		
Rocky mountain physa	<i>Physella propinqua</i>	Gastropods	Blue		
Sunset physa	<i>Physella virginea</i>	Gastropods	Blue		
Threaded vertigo	<i>Nearctula sp. 1</i>	Gastropods	Blue		Special Concern
Western thorn	<i>Carychium occidentale</i>	Gastropods	Blue		
Audouin's night-stalking tiger beetle	<i>Omus audouini</i>	Insects	Red		Threatened
Autumn meadowhawk	<i>Sympetrum vicinum</i>	Insects	Blue		
Black petaltail	<i>Tanypteryx hageni</i>	Insects	Blue		
Clodius Parnassian, <i>claudianus</i> subspecies	<i>Parnassius clodius claudianus</i>	Insects	Blue		
Clodius Parnassian, <i>pseudogallatinus</i> subspecies	<i>Parnassius clodius pseudogallatinus</i>	Insects	Blue		
Dun skipper	<i>Euphyes vestris</i>	Insects	Blue		Threatened
Emma's dancer	<i>Argia emma</i>	Insects	Blue		
Grappletail	<i>Octogomphus specularis</i>	Insects	Red		
Hairy-necked Tiger Beetle	<i>Cicindela hirticollis</i>	Insects	Blue		
Hoffman's checkerspot	<i>Chlosyne hoffmanni</i>	Insects	Red		
Johnson's hairstreak	<i>Callophrys johnsoni</i>	Insects	Red	Y	

English Name	Scientific Name	Class (English)	BC List	Provincial FRPA	SARA Status
Monarch	<i>Danaus plexippus</i>	Insects	Red		Special Concern
Propertius duskywing	<i>Erynnis propertius</i>	Insects	Red		
Silver-spotted Skipper	<i>Epargyreus clarus</i>	Insects	Blue		
Silver-spotted Skipper, <i>californicus</i> subspecies	<i>Epargyreus clarus californicus</i>	Insects	Red		
Vivid dancer	<i>Argia vivida</i>	Insects	Blue		Special Concern
Western Pine Elfin, <i>sheltonensis</i> subspecies	<i>Callophrys eryphon sheltonensis</i>	Insects	Blue		
Zerene Fritillary, <i>bremnerii</i> subspecies	<i>Speyeria zerene bremnerii</i>	Insects	Red		
<b>Plants</b>					
Leafless wintergreen	<i>Pyrola aphylla</i>	Dicots	Blue		
Cryptic paw	<i>Nephroma occultum</i>	Lichens	Blue		Special Concern
Flaking tarpaper	<i>Collema flaccidum</i>	Lichens	Red		
Midlife vinyl	<i>Scytinium californicum</i>	Lichens	Blue		
Peacock vinyl	<i>Scytinium polycarpum</i>	Lichens	Yellow		Special Concern
Poor pocket moss	<i>Fissidens pauperculus</i>	Moss	Red		Endangered
<b>Ecological Communities</b>					
Arbutus / Hairy Manzanita	<i>Arbutus menziesii</i> / <i>Arctostaphylos columbiana</i>	Terrestrial	Red		
Douglas-Fir - western hemlock / salal Dry Maritime	<i>Pseudotsuga menziesii</i> - <i>Tsuga heterophylla</i> / <i>Gaultheria shallon</i>	Terrestrial	Red		
Douglas-Fir / Sword Fern	<i>Pseudotsuga menziesii</i> / <i>Polystichum munitum</i>	Terrestrial	Red		
Sitka spruce / salmonberry Dry	<i>Picea sitchensis</i> / <i>Rubus spectabilis</i>	Terrestrial	Red		
Wallace's Selaginella / Reindeer Lichens	<i>Selaginella wallacei</i> / <i>Cladina spp.</i>	Terrestrial	Blue		
Western hemlock - western redcedar / deer fern	<i>Tsuga heterophylla</i> - <i>Thuja plicata</i> / <i>Struthiopteris spicant</i>	Terrestrial	Red		

English Name	Scientific Name	Class (English)	BC List	Provincial FRPA	SARA Status
Western hemlock / flat-moss	<i>Tsuga heterophylla</i> / <i>Buckiella undulata</i>	Terrestrial	Blue		
Western Redcedar / Sword Fern Dry Maritime	<i>Thuja plicata</i> / <i>Polystichum munitum</i> Dry Maritime	Terrestrial	Red		
Western redcedar / three-leaved foamflower Dry Maritime	<i>Thuja plicata</i> / <i>Tiarella trifoliata</i> Dry Maritime	Terrestrial	Blue		
Western Redcedar / Salmonberry	<i>Thuja plicata</i> / <i>Rubus spectabilis</i>	Terrestrial	Red		



## **APPENDIX B**

### **Site Photos**



**PHOTO 1: OVERVIEW WEST OF FAS PLOT AG01 IN AN3A.**



**PHOTO 2: OVERVIEW OF FAS PLOT AG02 IN AN3A, LEFT PHOTO IS LOOKING NORTH, RIGHT PHOTO IS LOOKING EAST.**



**PHOTO 3: OVERVIEW OF FAS PLOT AG03 IN AN03, LEFT PHOTO IS LOOKING SOUTH, RIGHT PHOTO IS LOOKING EAST.**

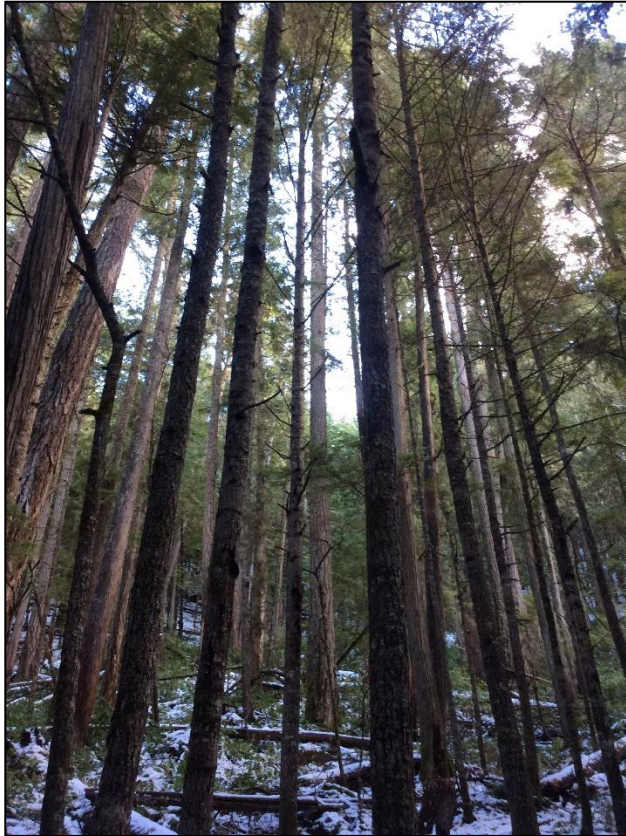


**PHOTO 4: OVERVIEW OF FAS PLOT AG04 IN AN03, LEFT PHOTO IS LOOKING NORTH, RIGHT PHOTO IS LOOKING SOUTH.**



**PHOTO 5: OVERVIEW OF FAS PLOT AG05 IN AN03, LEFT PHOTO IS LOOKING EAST, RIGHT PHOTO IS LOOKING WEST. LEAVE TREES FOR IN STAND RETENTION HAVE ORANGE DOTS.**





**PHOTO 6: OLDER FOREST OUTSIDE OF AN3A BETWEEN FC40 AND FC41, SEVERAL LARGE (>70 CM DBH) DOUGLAS-FIR TREES OUTSIDE OF BOUNDARY AND RECOMMENDED FOR INCLUSION IN RESERVE NETWORK OR LONG-TERM RETENTION.**



**PHOTO 7: POTENTIAL DEN FOUND NEAR FC45 (NOW EXCLUDED FROM BLOCK).**



## APPENDIX C

# Revised Block Maps

The following map reflects block amendments to AN03 and AN3A based on the recommendations from a draft version of this report, the second informal field survey in June 2023, other assessments (geotechnical and archaeological), and engineering considerations.

**FIGURE 8. FINAL HARVEST PLAN MAP FOR AN03 PROVIDED BY THE SCCF.**

**Harvest Plan / Road Construction Map Block AN03**



**Block AN03**

Scale: 1:5,000  
 Region: RSC  
 District: DSC  
 Mapsheet: 92G052  
 Location: Angus Creek  
 UTM Zone: 10  
 UTM Easting: 447047  
 UTM Northing: 5487362  
 Latitude: 49°32'11.58"N  
 Longitude: 123°43'54.74"W  
 TAUP (ha): 5.0

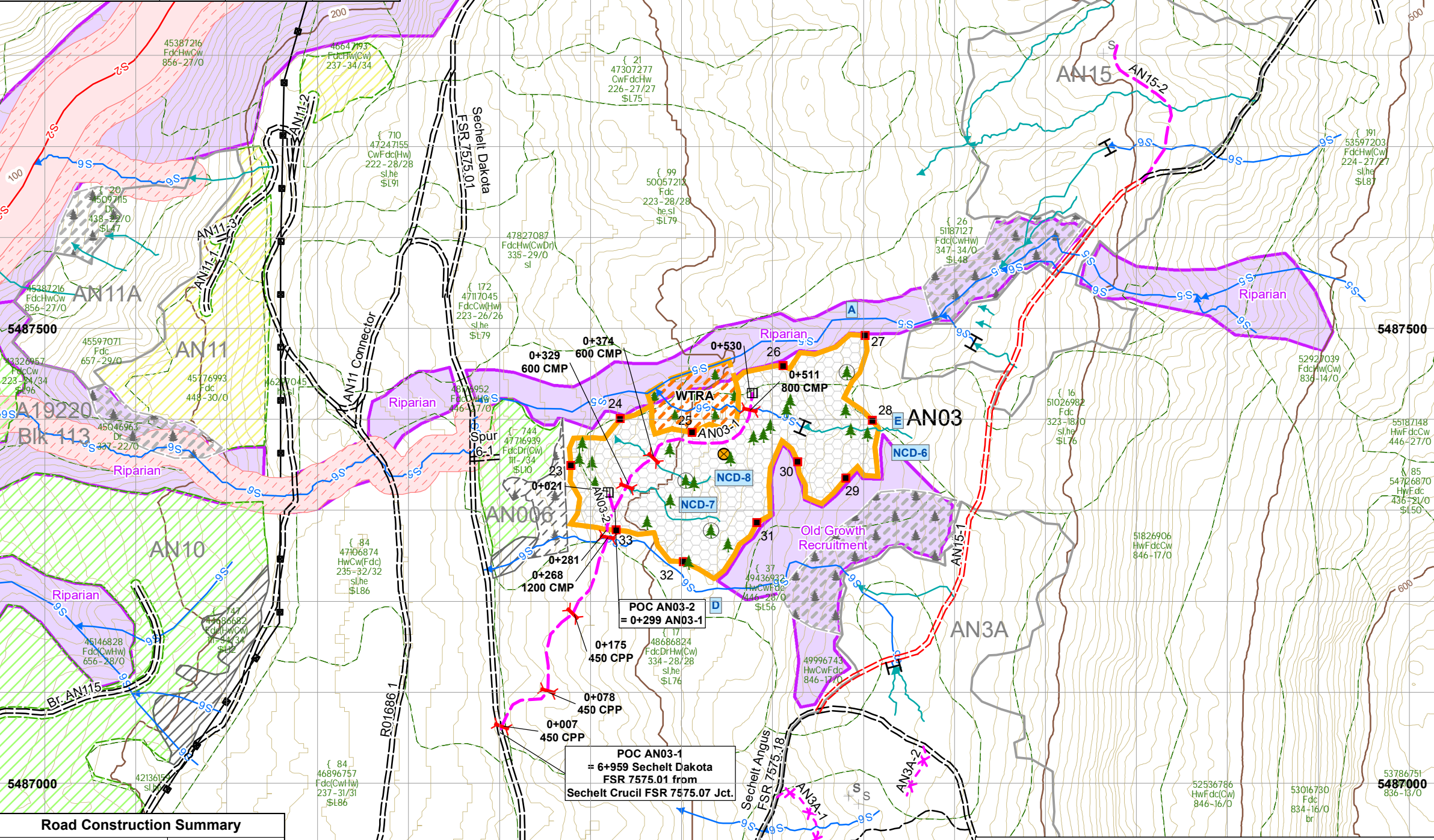
- Management Areas**
- Riparian Stream Class-FISH: S1, S2, S3, S4 (Red dashed line)
  - Unknown (Red solid line)
  - Riparian Stream Class-NO FISH: S5, S6 (Blue dashed line)
  - Unknown (Blue solid line)
  - Non-classified Drainage (Green dashed line)
  - Seepage (Blue dashed line with arrows)
  - Stream Class, Reach Break (S5/S6 with T)
  - Riparian Lake (L1-L4) (Blue oval)
  - Riparian Wetland (W1-W5) (Blue wavy line)
  - Water Body ID # (A1)
  - Retention Patch (Engineered) (Green hatched)
  - Retention Patch (Proposed) (Light Green hatched)
  - Adjacent Retention Patch (White hatched)
  - Dispersed Retention Trees (Green tree icon)
  - Dispersed Retention Trees (Group) (Green tree icon in circle)
  - Wildlife Tree Retention Area (WTRA) (Green hatched with tree icons)
  - Adjacent Wildlife Tree Retention Area (AWTRA) (White hatched with tree icons)
  - Road Right-of-Way (Grey hatched)
  - Riparian Reserve Zone (Pink hatched)
  - Riparian Management Zone (if different than SU prescription) (Light Pink hatched)
  - Ground-Based Yarding Area (Green hatched with diagonal lines)
  - Helicopter Harvest Area (Yellow hatched with diagonal lines)
  - Ground Based Area >35% Slope (Red hatched with diagonal lines)
  - Windthrow Management Area (Black hatched with diagonal lines)
  - Machine Free Zone (MFZ) (Black box)
  - Special Management Zone (SMZ) (Green box)
  - Park (Green box)
  - Water Supply Intake (Blue circle with 'i')
  - Previous Harvest (NSR, SR, GU)
  - Community Forest Boundary (Red dashed line)
  - Community Watershed (Blue dashed line)
  - Old Growth Mgmt. Area (Purple hatched)
  - Ungulate Winter Range (Brown hatched)
  - Private Land (Yellow hatched)
  - First Nations Treaty Area (Green dashed line)
  - Stewardship Area (Purple hatched)

- Field Marking**
- Falling Bdry: Orange Ribb. & Blazed Painted Orange
  - Retention Patch: Orange Black Stripe Ribbon & Blazed Painted Orange
  - Road Centre Line: Pink Ribb. & Blazed Painted Pink
  - Road ROW: Orange Ribb. & Blazed Painted Orange
  - Falling Corner: Blazed Painted Orange
  - Dispersed Retention Trees: Orange Painted Dot Each Side & Base
  - Special Mgt Zone: Orange Labelled Ribbon
  - Fish Stream: Red White Stripe Ribbon
  - Non Fish Stream: Blue White Stripe Ribb.
  - Deflection Line: Green Ribbon
  - Machine Free Zone: Red Ribbon
  - Cruise Tree: Blue Painted Number

25m 0 25 50 100 150m  
 Scale: 1 : 5,000  
 Digital Mapping by: **CHARTWELL**  
 Project Number: 21-610  
 Drawn By: JC  
 Date: 2023-03-01

**Stream Summary**

Stream Reach ID	Stream Class	Reserve Zone Width (m)	Mgmt. Zone Width (m)
A	S5	0	30
D, E	S6	0	20
NCD-6, NCD-7, NCD-8	NCD	0	0



**Road Construction Summary**

Road Section	Length (km)
AN03-1	0.530
AN03-2	0.021
<b>Total Roads</b>	<b>0.551</b>

**Logging Area Summary (ha)**

Block	Gross	Retention	WTRA	RP RoW	NP Nat.	Exist.Rd.	Net Harv
AN03	5.0	0.0	0.6	0.0	0.0	0.0	4.4

**Harvest System Summary (ha)**

Block	Heli	Cable	Ground-Based	Total
AN03	0.0	0.0	4.4	4.4

**Culvert Summary**

Road Number	Road Station	Culvert Type	Culvert Dimensions		Culvert Skew
			Diameter	Length	
AN03-1	0+007	CPP	450	9	90
AN03-1	0+078	CPP	450	9	90
AN03-1	0+175	CPP	450	9	90
AN03-1	0+268	CMP	1200	12	90
AN03-1	0+329	CMP	600	9	90
AN03-1	0+374	CMP	600	9	90
AN03-1	0+511	CMP	800	9	90

- Legend**
- Total Area Under Prescription (TAUP):
    - Falling Boundary (Orange dashed line)
    - External to Falling Bdy (Yellow dashed line)
  - Falling Corner (Red square)
  - SP Plot (Purple circle)
  - Standard Unit Boundary (Red dashed line)
  - Treatment Unit Boundary (Black dashed line)
  - Existing Road (Double line)
  - Existing Trail (Dashed line)
  - Proposed Roads:
    - Haul Road (Pink dashed line)
    - Designated Skid Trail (Orange dashed line)
    - Temporary (Rehab) (Pink dashed line with X)
    - Backspar Trail (Purple dashed line)
    - Road Reconstruction (Red dashed line with double lines)
  - Road Chainage (Black line with numbers)
  - Bridge (Existing) (Black line with arch)
  - Bridge (Proposed) (Black line with arch)
  - Culvert Proposed/Existing (Black line with arch)
  - Survey Route (Black line with arrows)
  - Unclassified Road (Black line)
  - Rock Outcrop Area (Black hatched with diagonal lines)
  - Proposed / Designated Stream Crossing (Blue line with diamond)
  - Gravel Pit (Black square with 'GP')
  - Transmission Line (Black line with cross-ticks)
  - Utility Corridor (Black line with cross-ticks)
  - Permanent Structures (Black square)
  - Slide (Black line with arrows)
  - Gully (Black line with arrows)
  - Rock Outcrop (Black hatched with diagonal lines)
  - Windfall/Snag (Black line with arrows)
  - Marsh/Swamp (Blue wavy line)
  - Index Contour and Label (Brown line with number)
  - Intermediate Contour (Brown line)
  - Landing/Temporary Landing (Black diamond)
  - Dryland Sort/Water Sort (Black diamond with 'DS'/'VS')
  - Log Dump/Helipad (Black circle with 'LD'/'H')
  - Helicopter Drop Zone (Black circle with 'HD')
  - Geographic Centre (Black circle with 'X')

- Harvest System**  
 (Yarding Direction)
- Ground Based (Black arrow)
  - Skyline (Black arrow with 'SL')
  - High-lead (Black arrow)
  - Harvest System Split Line (Green dashed line)
  - Yarding Split Line (Green dashed line)

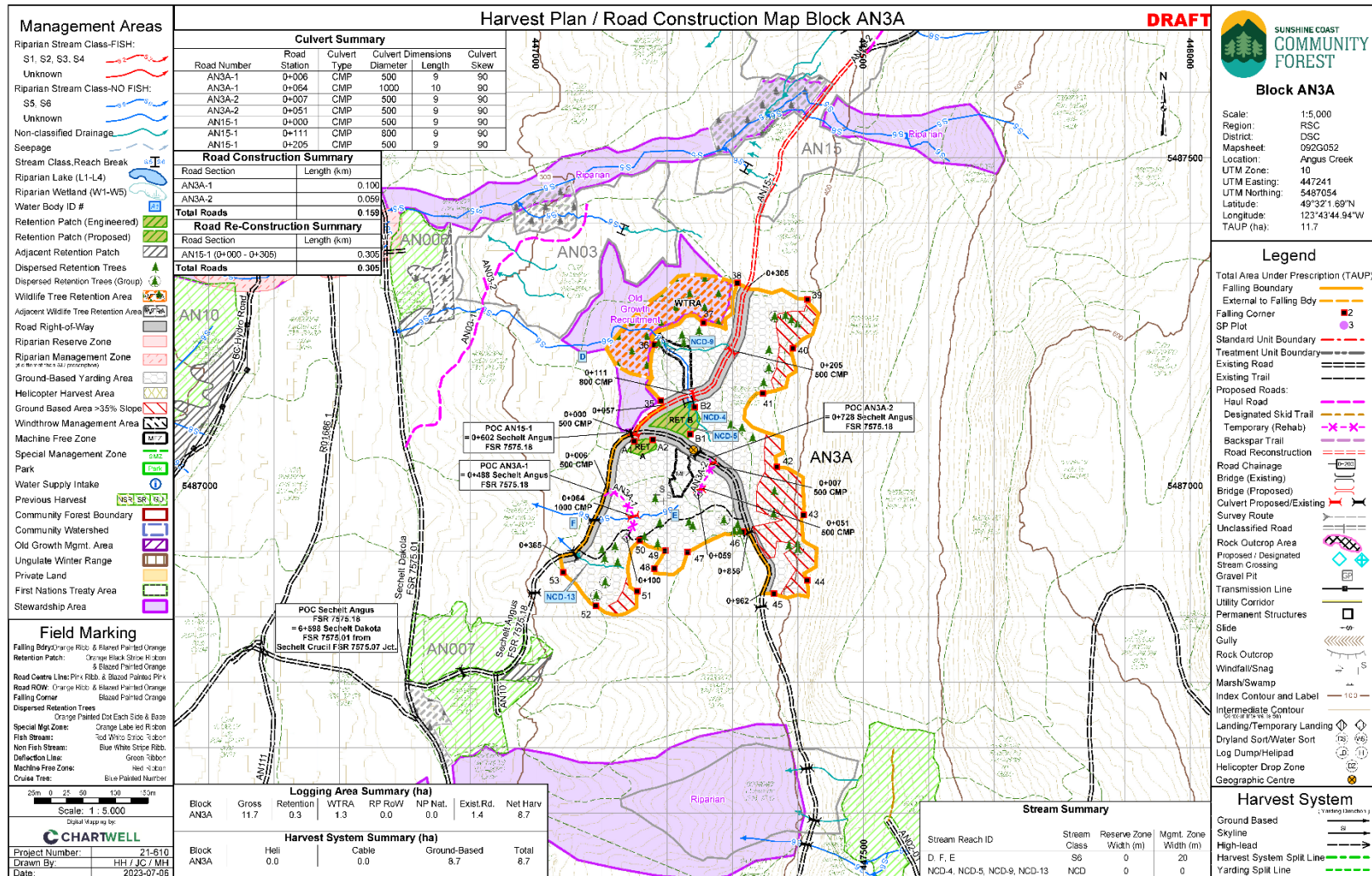
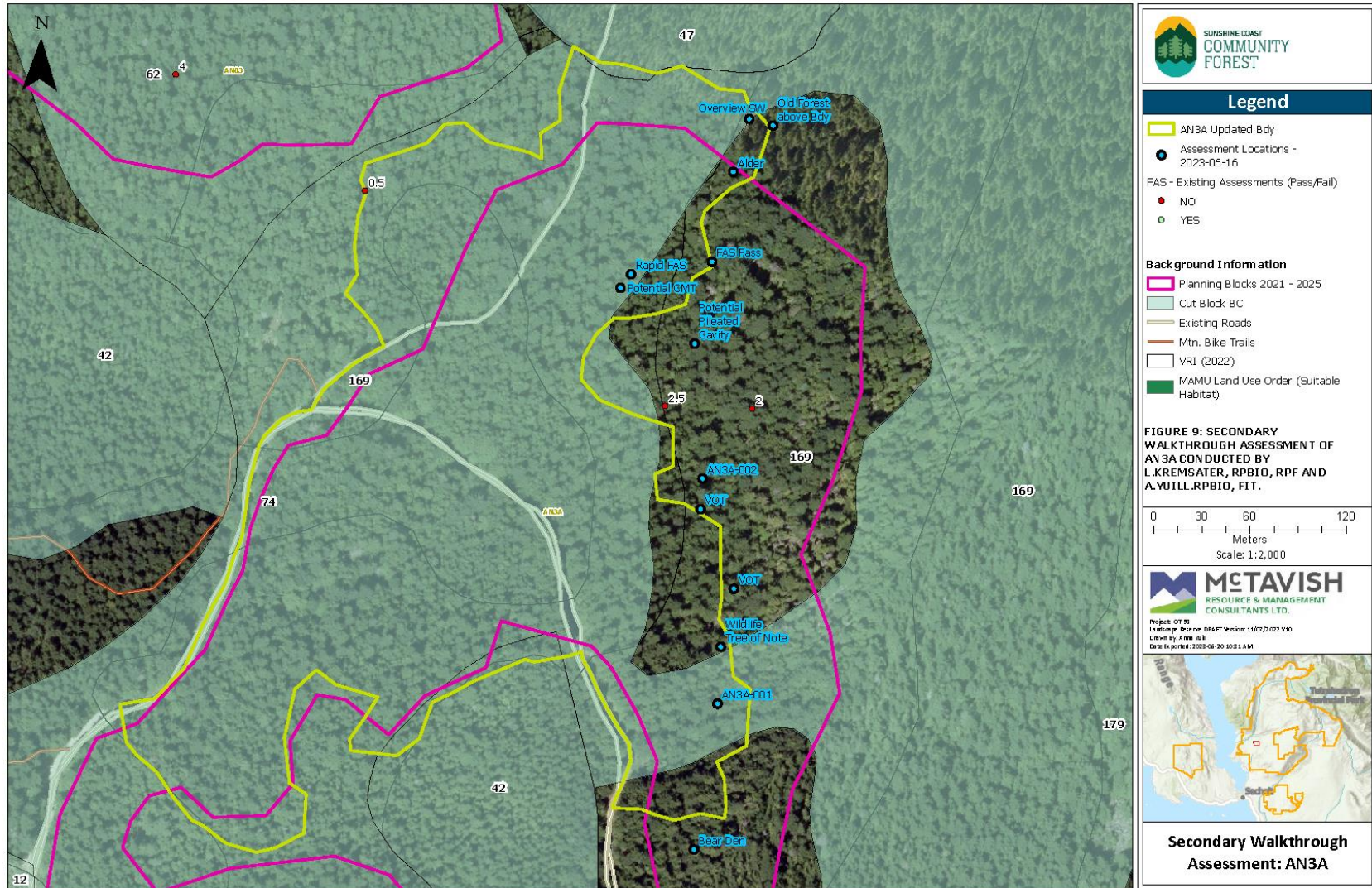


FIGURE 9: FINAL HARVEST PLAN MAP FOR AN3A PROVIDED BY THE SCCF.



## APPENDIX D

### **Map from June 2023 block walk.**



**FIGURE 10: SECONDARY WALKTHROUGH ASSESSMENT OF AN3A CONDUCTED BY L. KREMSATER, RPBIO, RPF AND A. YUILL, RPBIO, FIT. JUNE 2023**