OMINECA SPRUCE BEETLE 2021 ACTION PLAN REPORT

Omineca Spruce Beetle Management Team.

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EXECUTIVE SUMMARY

Regarding your February 18, 2021 request for a response by Forest Licensees and BCTS to the Omineca spruce beetle outbreak, please find the enclosed package. This package outlines the continued efforts of Forest Licensees and BCTS with directly affected operating areas to work with your office, the broader MoFLNRORD and the other licensees without directly affected operating areas to adapt management strategies that seek to minimize the effects of Spruce Beetle on timber supply, specifically within the Prince George and Mackenzie Natural Resource Districts.

Within this report the Omineca Spruce Beetle Managmeent Team (OSBMT) has outlined a strategic harvest scenario to address dead and dying stands caused by spruce beetle. This process utilized numerous datasets and incorporated operational considerations to identify stands that could be harvested within a 7 year shelf-life time-frame. The 2021 Action Plan continues to identify stands to defer for midterm timber reasons, and to retain mature stands to meet legal and non-legal objectives. The plan has also incorporated Chief Forester guidance surrounding retention and the harvest prioritization matrix.

This 2021 IBS Action Plan continues to incorporate best available science and information obtained through collaboration with MoFLNRORD staff, experts, and contractors. This process has been integral to the implementation of previous iterations of the Spruce beetle Action Plan. As part of this process the Omineca Spruce Beetle Management Team (OSBMT) continues to work collaboratively with your office and the broader Omineca IBS group to minimize the long-term impacts to timber supply, while seeking to limit impacts to all non-timber related stakeholders.

Thank you for your continued support for this process.

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Key Messages

- The 2020 Aerial Overview Survey (AOS) data shows an decrease in infestation area of roughly 135,000 hectares from the area reported in the 2019 AOS data.
- The focus of this plan is prioritizing and planning harvesting activities to reduce beetle populations, minimize the impact on mid-term timber supply, while maintaining non-timber values in spruce ecosystems.
- Transparency of information sharing to the public, communities and First Nations continues through: enhanced reporting, involvement from Omineca Region Forest Licensees, and public outreach opportunities such as the Spruce Beetle Summit and the Spruce Beetle Public Advisory Committee
- All information contained within this plan is based on best information available to the OSBMT at the time of the plan's development. The data inputs are from strategic level dataset that do not necessarily translate to operational reality.
- The OSBMT will ensure adherence to the most recent Guidelines for Hauling, Milling and Storing strategies issued by the MoFLNRORD for the 2021 – 22 year.
- There are 50,392 hectares of Planned Harvest. This will address all identified unconstrained target stands. 94% of the full Prince George and Mackenzie impacted area in the Omineca is either constrained or non-THLB .
- There are 49,431 ha of deferred and ha or retained. Over 26% of the area identified through the action plan has been deferred for midterm or other considerations,
- There are 84,418 retained stands, consisting of 45% of the affected area. Significant legal and non-legal constraints and operational considerations that lead to deferral and retention.
- The Years to action results show that the OSBMT can address the impacted stands within their respective operating areas within the 7-year stand shelf-life timeframe. No participant has a 'Years to Action' of target stands greater than 7 years.

The OSBMT recommends the following:

- Transition away from forest health specific Action Plans to collaboratively developed comprehensive land use plans and consider instead incorporating forest health within a larger collaborative land use planning exercise with the recognition that some licensees are disproportionately affected by spruce beetle and Business to Business opportunities should be considered prior to moving into undamaged stands.

- MoFLNRORD should proceed with monitoring and performance measures as Outlined in this report.

BCTS BC Timber Sales Prince George

Sinclar Group FOREST PRODUCTS LTD.

CANFOR

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INTRODUCTION

The 2021 Spruce Beetle Action Plan (2021 Action Plan) represents the 6th iteration of a request from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MoFLNRORD) to the affected forest tenure holders and BCTS to demonstrate how they are responding to the ongoing spruce beetle infestation within the Omineca Region. These affected licensee participants and BC Timber Sales (BCTS) form the Omineca Spruce Beetle Management Team (OSBMT).

The purpose of this 2021 Action Plan is to demonstrate how the OSBMT are addressing spruce beetle within the most severely impacted stands within the estimated 7-year stand shelf life of spruce trees. In addition, and specific to the requests described in the letter titled "Spruce Beetle Management Expectations" dated February 18, 2021, the OSBMT has provided a spatial product in the form of PDF maps and associated spatial data, as well as a discussion regarding consistency with the Chief Forester Expectations for Prioritization in Response to Spruce Beetle Outbreaks, November 2020.

As in previous years, the OSBMT continues to work with the MoFLNRORD GIS analyst to provide a comprehensive dataset to support forest management decisions made considering forest health, specifically spruce beetle. The analysis for the 2021 Action Plan uses assumptions and netdowns as agreed to by the OSBMT and MoFLNRORD staff. The use of the MoFLNRORD GIS analyst and agreed upon netdowns are components of the Action Plan process that have been integral to the five previous iterations of the Spruce Beetle Action Plan. As part of this process the OSBMT continues to work collaboratively with your office and the broader Omineca Spruce Beetle Working Group to minimize the long-term impacts to timber supply, while seeking to limit impacts to all non-timber values.

This report outlines the efforts of the OSBMT to put forward a comprehensive plan that seeks to minimize the effects of the spruce beetle infestation on timber supply, specifically within the Prince George and Mackenzie Natural Resource Districts (NRD).

This plan was a spatial exercise to analyze the existing spruce beetle impacts on the landbase, and what participating licensees and BCTS are doing to address both the timber and non-timber impacts in their traditional operating areas. This plan does not preclude consultation with First Nations and stakeholders through Forest Stewardship Plans , Operating Plans, and other communication tools. Further, strategic initiatives such timber supply review (TSR), cell-reallocation, environmental stewardship initiative (ESI), and business to business agreements are being undertaken to ensure all First Nation and public values are incorporated into Forest Planning.

APPLICATION OF ALLOWABLE ANNUAL CUT (AAC) TO SPRUCE BEETLE INFESTATION

The September 2019 Regional Executive Director's (RED) expectation letter requested that each affected licensee indicate how much AAC they would apply to spruce beetle impacted stands. Prior to the 2020 Action Plan, it was assumed that all licensee AAC's were being applied to spruce beetle infestation management, despite the inclusion of a rationale explaining why this would not be the case. For the 2020 and 2021 action plans, the AACs were modified to reflect the rationale for limited application of AACs to spruce beetle impacted stands. Licensees and BCTS operations are varied, both geographically and economically. Mill requirements, the remaining mountain pine beetle stands, and other reasons preclude participants from applying their entire AACs.

On February 7, 2020 the OSBMT provided an updated licensee AAC capacity table as an interim measure while awaiting the release of the 2019 AOS data. This updated table with a projected proportion of AAC directed towards

spruce beetle was incorporated into the 2020 Action Plan and was modified for the 2021 Action Plan to remove Conifex Licence associated with 1040806 BC Ltd. Table 1 shows the AACs applied for the 2021 Action Plan.

Table 1 Licensee and BCTS AAC Capacity as Volume (m3) and Area (ha) applied to Spruce beetle impacted stands

Licensee	District	License	AAC (m3)	Projected AAC directed to Sx Beetle (m3/year) as of April 2021	AAC to Area Conversion @ (305m3/ha*)
BCTS MK	Mackenzie NRD	Mackenzie	900,000	900,000	2,951
Canfor MK	Mackenzie NRD	A15384	1,082,904	419,289	1,375
Conifex	Mackenzie NRD	A15385	632,500	250,000	820
MK Subtotal	Mackenzie TSA		2,615,404	1,569,289	5,145
BCTS PG	PG NRD	PG	900,000	900,000	2,951
Carrier	PG TSA	PG	253,027	65,000	213
Canfor PG	PG NRD	PG	1,597,771	798,886	2,619
Sinclar	PG TSA	PG	1,021,628	750,000	2,459
PG Subtotal	PG District		3,772,426	2,513,886	8,242
Total	**Omineca**		**6,387,830**	**4,083,175**	**13,387**

**The 305m3 per hectare conversion factor from area to volume applied in this plan is the same as that used in the previous plan. This value was derived from the cumulative licensee harvest reporting to MoFLNRORD from 2016-2019 and has been kept the same for consistency.*

AERIAL OVERVIEW SURVEY DATA

The 2020 Aerial Overview Survey (AOS) of forest health factors was conducted during the summer and fall of 2020 and made available to the OSBMT in February 2021. The area of infestation dropped by 133,653 ha between the 2019 and 2020 AOS datasets. Beginning around 2012, the infestation then grew to a peak in 2017, dropped in 2018 only to climb again in 2019. The 2020 results show a significant drop from the previous year. Figure 1 below shows the total area in the AOS impacted by spruce beetle in all severity classes from 2013 to 2020. Despite this drop, the Omineca Region still accounts for approximately forty percent of the spruce beetle infestations identified at a provincial level. Figure 2 below shows an overview map of the most heavily infested area within the Omineca region timber harvesting land base (THLB).

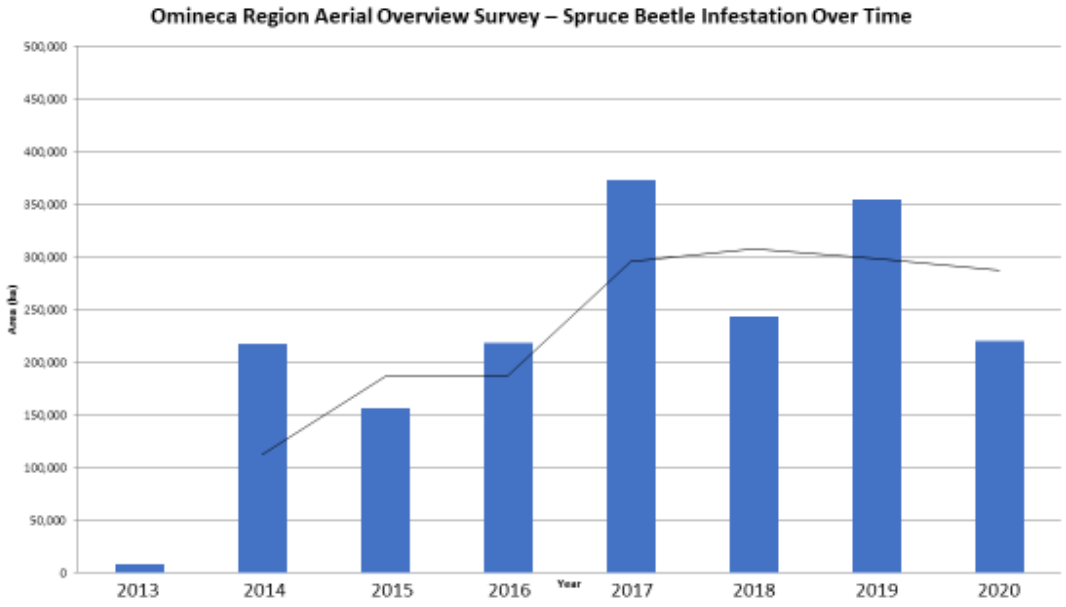

Figure 1 Omineca Region AOS - Spruce Beetle Infestation Area over Time. This is each years' AOS independent of the previous years' AOS (i.e.: Not Accumulated AOS).

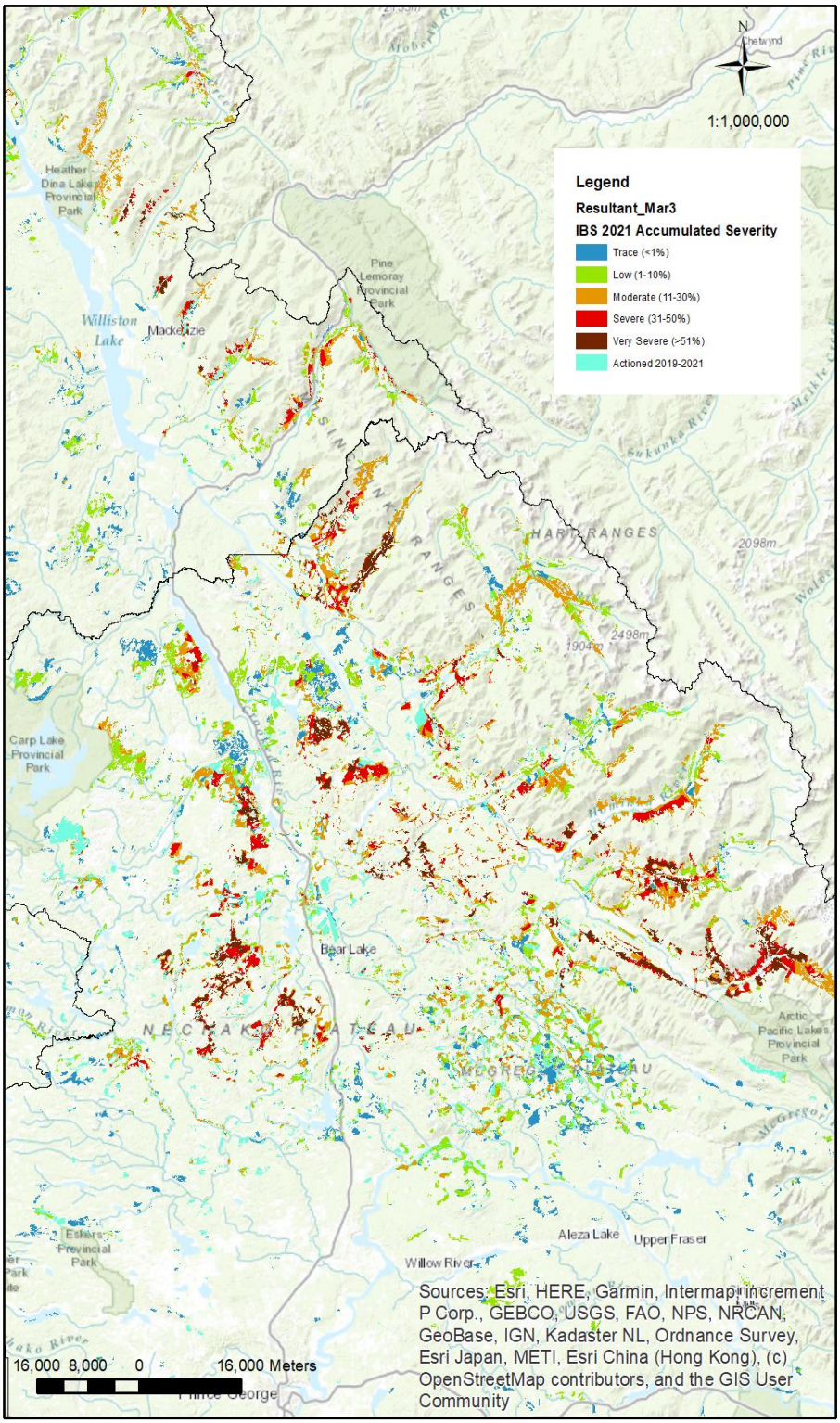

Figure 2 Overview Map of most concentrated spruce beetle attack (2020 AOS) with non-THLB excluded.

NETDOWN OF AOS

The spruce beetle component of the 2020 AOS data coverage was used to create the 2020 Accumulated AOS severity layer (using only Forest Health Factor = IBS[1]). The accumulated layers are an aggregation of previous AOS years' severity classes combined with the newest year. Each years' severity is converted to a mid-point severity percent then added together to provide the accumulative total. That accumulated total is then converted back to an accumulated severity class. For more detail on this process see Appendix 2 – 'Creating the Accumulated AOS'. The AOS was then reduced to only Timber Harvest Landbase (THLB), and then to only stands that were spruce leading (Species_CD_1 = all spruce species) as well as stands with spruce as a secondary component if that proportion exceeded 35% (Species_CD_2 = all spruce and Species_CD_2_PCT >35%). Figure 3 below displays the process of netting down the AOS to final action plan results.

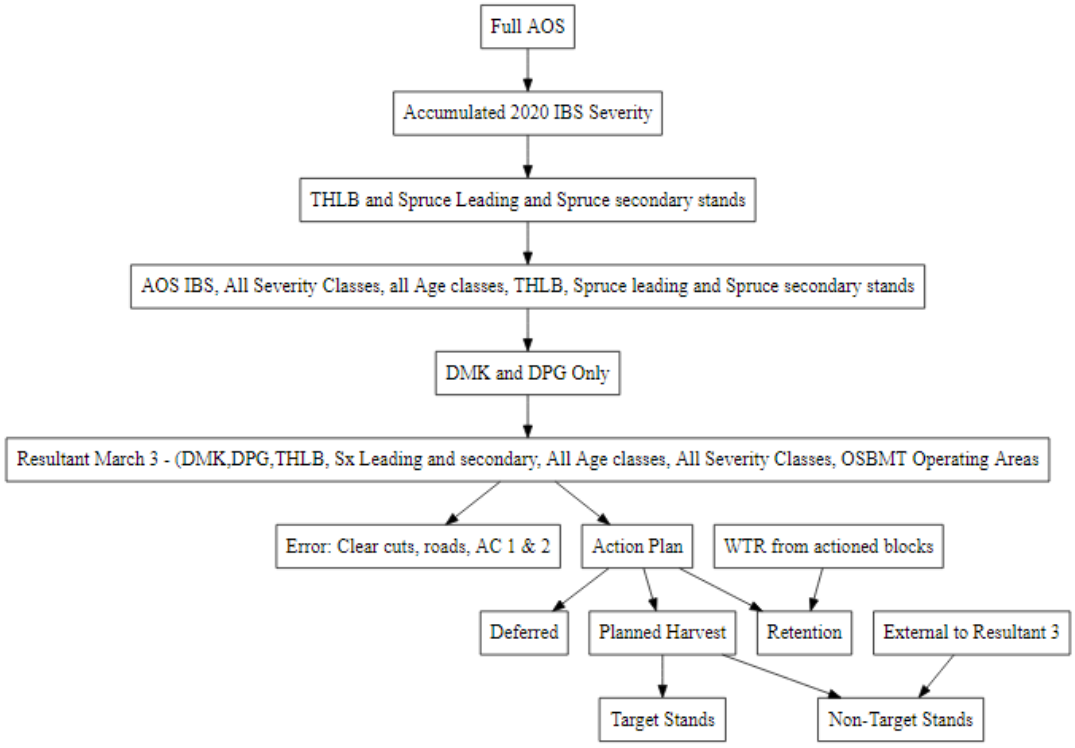

Figure 3 - Flow diagram of Netdown process from Full AOS to Action Plan Results.

[1] IBS Means "Insect-Bark Beetle- Spruce"

For the THLB netdown, the OSBMT analysis has taken the most recent THLB definitions for each Timber Supply Area (TSA) and applied these to the AOS data to reflect operational reality more accurately.

For the VRI based species netdown, after discussion in 2020 with MoFLNRORD representatives regarding relevant AOS-THLB intersect stands, the vegetation resource inventory (VRI) stand definition was broadened to include stands that had a secondary species component identified as spruce and was equal to or greater than 35%. This definition was further broadened by including all age classes, rather than restricting age class as in previous versions of the plan. This definition of relevant stands remains static in the 2021 Action Plan. This is shown in Table 2.

Table 2 Initial AOS VRI netdown query 2020 and 2021 Action Plans

Action Plan Iteration	2020 / 2021
Species Definition (VRI Attribute Data)	Species Cd 1 contains Sx; Species Cd 2 contains Sx and Species % 2 >= 35%
Age Class (VRI Attribute Data)	No Age Class Restriction

The netted down AOS-THLB-Spruce leading reduction contains all age classes and all AOS severity classes for the four Natural Resource Districts (NRD) contained within the Omineca Region.

The table below shows the AOS spruce beetle impacted area within both the gross AOS coverage, and the AOS-THLB-Spruce leading intersect by NRD and AOS severity class. As shown in Table 3 and expanded by severity class in Table 9 (see appendix 6) these netdowns to cut out non-THLB and non-spruce leading stands reduces the actionable by 70% from over 900 thousand hectares to only 274,000 hectares. Due to the small areas of moderate through to very severe infestation within the Robson Valley and Stuart Nechako NRD, the decision was made by the OSBMT in consultation with MoFLNRORD to maintain the focus of the 2021 Action Plan on the Mackenzie and Prince George NRDs.

When considering only the Prince George and Mackenzie NRDs, we further reduce the actionable area by an additional 7% to 222,000 hectares comprised of spruce stands (leading or secondary). This netted down area still contains some error including unmerchantable age classes and harvested area. All age classes were included in the AOS-THLB-Spruce leading intersect. Figure 5 shows the area of AOS-THLB-Spruce leading intersect categorized by age class and severity for the Prince George and Mackenzie NRDs. Table 3 and Table 9**.** show the distribution of severity classes within the AOS by Natural Resource District.

Table 3 - Summary by District of Netdown from IBS AOS to THLB and spruce stands.

District	Severity	Gross	THLB	THLB.Sx
DMK Subtotal	all	271,616	84,183	53,090
DPG Subtotal	all	485,436	280,451	169,749
DRV Subtotal	all	22,192	10,139	7,101
DSN Subtotal	all	125,442	60,421	44,154
Grand total	all	904,686	435,194	274,094
DMK and DPG Only·	all	757,052	364,634	222,839

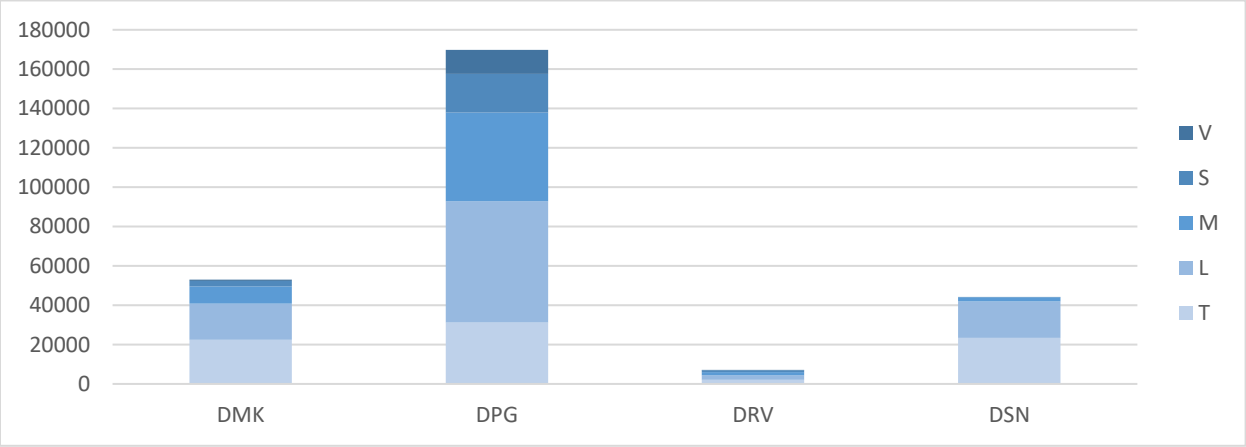

Figure 4 – Severity class distribution by District (THLB and Spruce stands, leading and secondary). Figure shows small amounts of more severe classes in DSN and DRV.

Age Class 1 and 2 were still present in the preliminary net down by THLB and spruce leading stand definition. Consistent with direction received from Dr. Jeanne Robert during the writing of the 2020 Action Plan, these age classes were removed during the categorization process of the 2021 Action Plan because they represent mapping errors within the larger AOS dataset. The full list of netdowns, in addition to the THLB and spruce leading stand definition, have been listed below in Table 3, and a flow diagram of the process is shown in Figure 3.

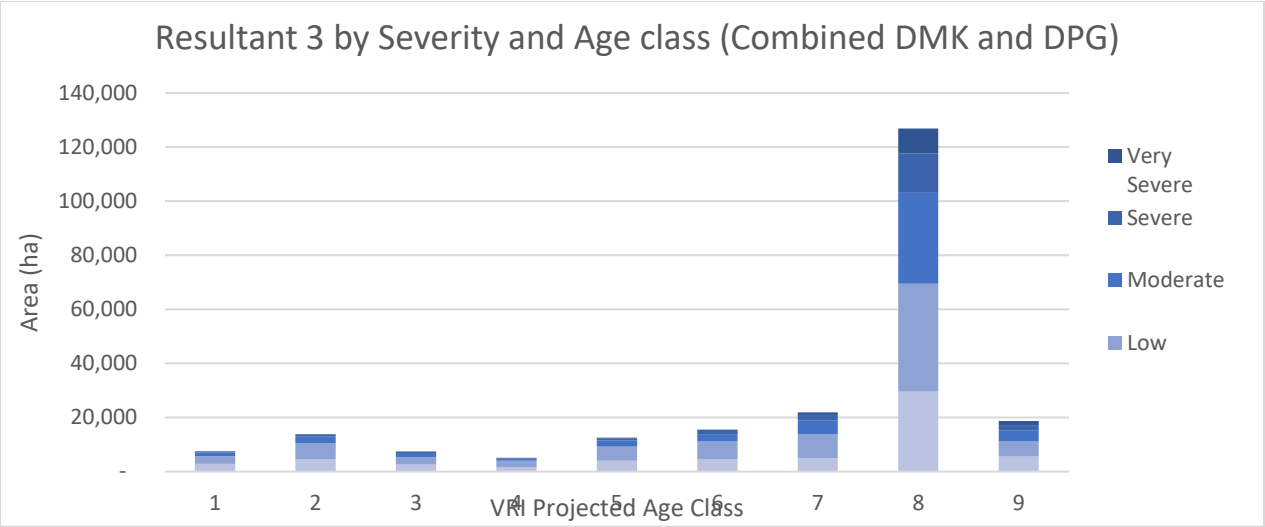

Figure 5 AOS-THLB-Spruce Leading Stands intersect for combined Prince George and Mackenzie NRDs – Area of AOS Severity Class by VRI Projected Age Class

RESULTANT 3

The final product of these multiple netdowns is a spatial dataset called Resultant_Mar_3 (Resultant 3). This layer is the spatial dataset that licensees and BCTS used to categorize affected stands into planned harvest, deferred or retained, as well as clearcut or errors not caught at earlier stages of netdowns. Figure 7 below shows the amount of each severity class the OSBMT Licensees and BCTS have in the Resultant 3 netdown. This figure shows the starting point for each participant and demonstrates that the infestation is not distributed equally among participants. The total amount 'available' to each licensee and BCTS is a sum of anything classed as deferred, retained, or planned harvest in the analysis. Figure 6 below shows the Omineca Region and specifeid the area under the plan as being DMK, and DPG with Robson Valley and TFLs excluded. Though Robson Velley is not a natrual resource district, we have labelled it as such in this plan.

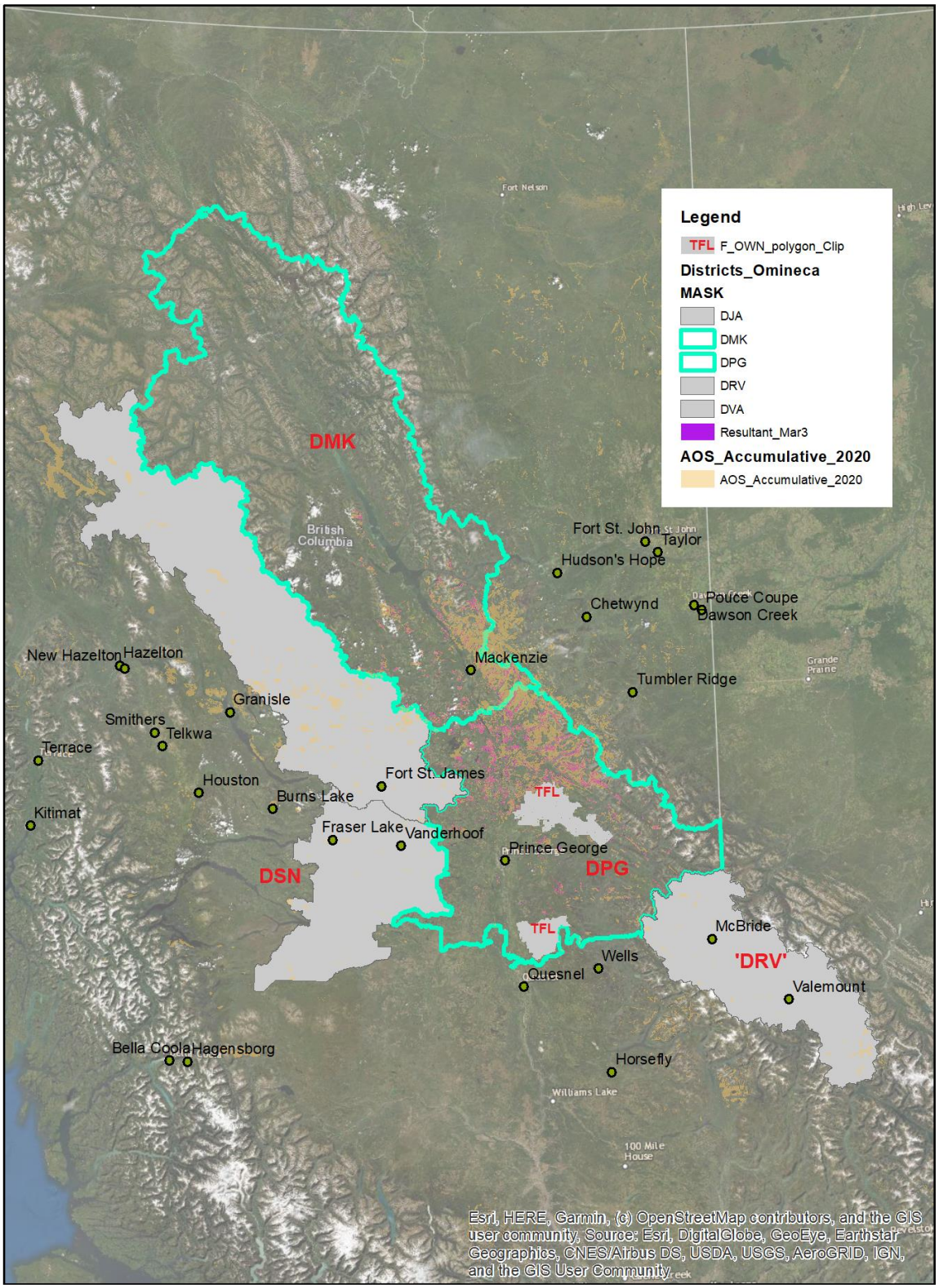

Figure 6 - Omineca Region with the Area under the Plan identified by teal boundary and excluding TFLs.

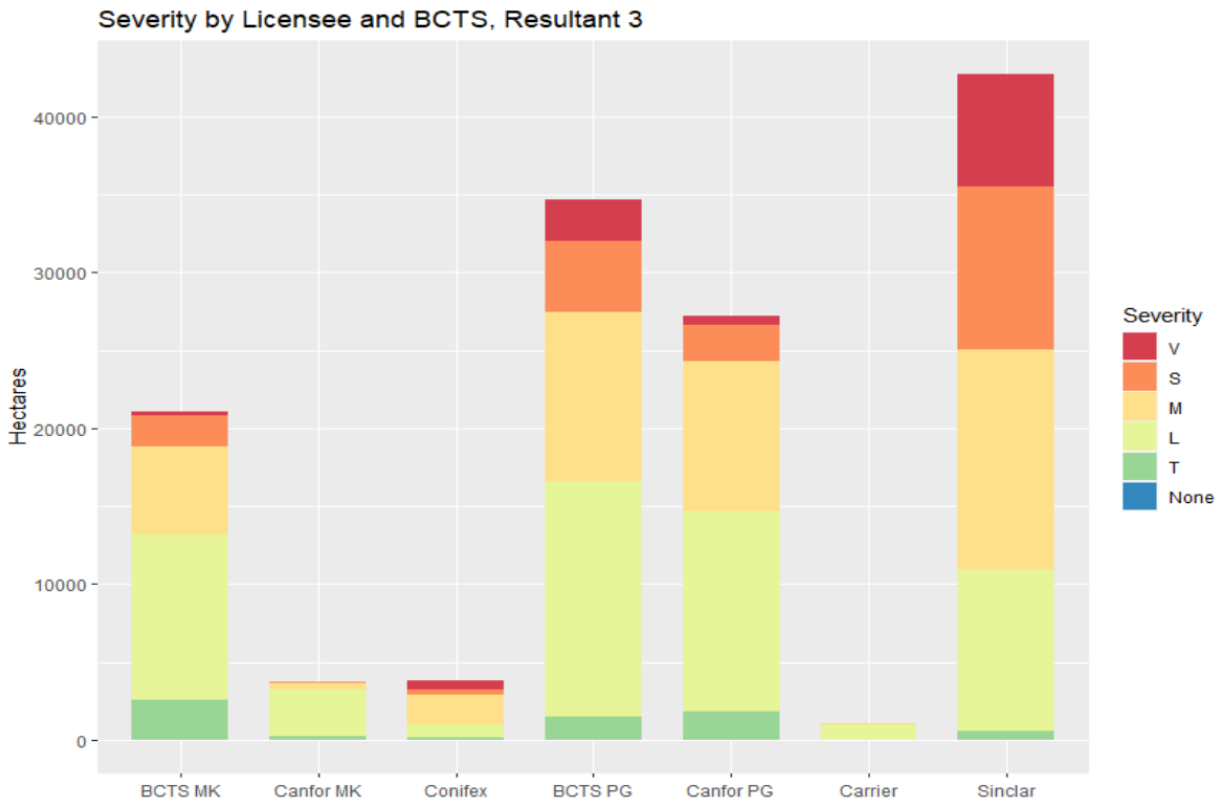

Figure 7 -Severity Class within Resultant 3 by Licensee and BCTS

TARGET STANDS

One of the main purposes of the action plan is to assess the feasibility of actioning spruce leading and secondary THLB stands that are in **low to very severe** AOS severity classes and over age class 5 and to identify the amount and reason that this subset (target stands) would not be able to be actioned. For this reason, results in this action plan are concentrated on target stands foremost, while reporting on other stand categories to a lesser extent in order to show how the AAC has been fully allocated among all stand types.

Stands considered as target for the spruce beetle action plan are a subset of Resultant 3 that meet the following specifications:

- THLB and spruce leading or as a secondary species >35%
- Low to Very Severe severity classes
- Age classes 6 to 9.

In addition, the OSBMT has only considered OSBMT participant operating areas.

NON-TARGET STANDS - RESULTANT 3 AOS VS NON-RESULTANT 3 AOS VS NON-AOS

The three categories of the 2021 Action Plan encompass more than the area identified as Resultant 3. This is because the intent has always been to provide an operational level plan to the greatest extent possible given the coarse strategic level inputs. The netdown process removes area at a coarse scale and when looked at through an operational lens, differences are apparent. Logical operational boundaries often require the inclusion of stands that do not meet the spruce leading VRI definition used in the Action Plan process. These stands may still contain spruce beetle and have an AOS severity code but would not be included in Resultant 3. In addition, the THLB definition is set at a TSR level and real-world conditions may include area not considered in this strategic level dataset. As this area removal happens as the very first step in the netdown process, both AOS and stand composition are not considered in this removal. The interaction of the various stand types both included and not included within Resultant 3 are depicted in Figure 8 below.

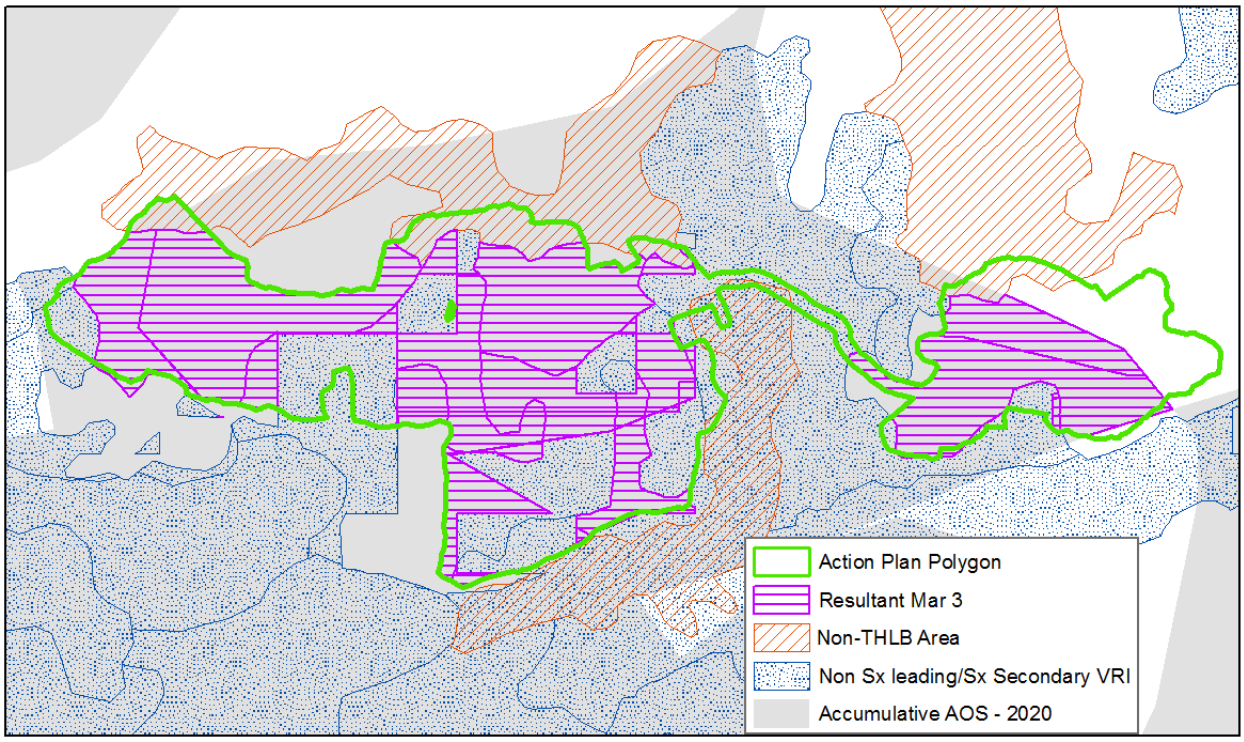

Figure 8 - Resultant 3 AOS vs Non-Resultant 3 AOS vs Non-AOS area within the Action Plan.

PLAN TIME FRAME (SHELF-LIFE)

The time frame of each Action Plan is 7 years. Information gathered through the office of the regional entomologist continues to support the assumption that a stand shelf life of seven years is appropriate based on spruce beetle infestation patterns. Spruce beetle tends to infest the oldest and largest trees in a stand first and then spreads to less susceptible individuals in subsequent years. Newly infested stands in the 2021 Action Plan year should be addressed by 2028 by the affected licensee. It should be noted that research into individual stem shelf life is underway through both CNC and FP Innovations. The OSBMT looks forward to the results of these projects and will consider any new information that could help inform the stand shelf-life assumption going forward.

METHODS

CATEGORIZING THE NETTED DOWN AOS (RESULTANT MARCH 3) INTO ACTION PLAN CATEGORIES

Each OSBMT participant was provided with Resultant March 3 by the MFLNRORD GIS analyst. With this layer, each participant clipped the Resultant to their own operating areas, and proceed to categorize each polygon of Resultant 3 AOS into four general categories:

- **Planned Harvest (PH)** – polygons scheduled for harvest within the 7-year shelf-life time frame (2021-2028).
- **Deferred (D)** – polygons not scheduled for harvest within the 7-year shelf-life time frame (2021-2028) due to one or more land base constraints, as shown in Appendix 3.
- **Retention (R)** – polygons intended to remain on the landscape.
- **Errors or Clearcut (CC)** – polygons removed from the analysis due to previous harvest history not associated with Action Plan and roaded areas or errors (in VRI or AOS).

The process of categorization is a challenging and subjective process. Planners used numerous constraints layers such as old growth management areas (OGMAs), ungulate winter range (UWR), fisheries sensitive watersheds (FSWs), or ESI boundaries as well as terrain layers such as slope class and contours. Non-spatial data was also incorporated such as the Licensee Landscape Biodiversity Order Working Group Results, Section 7 Notice habitat attributes, and FSW equivalent clearcut area (ECA) thresholds. Stakeholder considerations, if known, were also incorporated.

Each polygon of Low to Very severe within the Resultant was viewed, then lumped into the reserve, deferred, or planned harvest Categories. If there was an error, such as overlap with a harvested block or road, planners called it CC. If there was a constraint that could not be resolved (such as a terrain or permanent legal issue), the area was classed as retention. If there were no terrain or permanent issues, the area could be classed as either deferred or planned harvest. When faced with this decision, planners typically used a VRI layer to begin. If the area was low volume, it may be classed as deferred midterm or deferred problem forest type. If it was isolated from any other harvestable patch, it may be classed as deferred isolated. If the area was large enough to harvest, but there was no access, such as if it was on a floodplain or would require extensive and expensive infrastructure, it may be classified as deferred access. If none of these terrain or economic constraints applied, planners checked for legal constraints and First Nations accommodations. A legal constraint may include a spatial exclusion such as ungulate winter range, or a cumulative a-spatial threshold such as an ECA threshold or a Section 7 habitat requirement to maintain certain habitat components on the landscape. First Nations accommodations may include Nation specific agreements or may apply to larger areas such as moose, riparian, and biodiversity management area immediate measures within the ESI study area. This constraint also covers accommodated interest areas identified through previous dialogue with First Nations.

If no constraints are identified, the polygon would likely then be classified as planned harvest. The planner would then sketch out a logical block boundary, including Target as well as non-target, in order not to isolate THLB. If the areas within the sketched block shape are external to the Resultant 3, these areas would then be added to the Action Plan. These components of the block may or may not have severity classes, but if they do, they would be spatially unioned to the action plan to determine their severity class, regardless of VRI spruce content. Areas that are already in development or permitted are also classified as planned harvest.

Areas that have been either sold (BCTS), have been harvested or are being harvested during the Action Plan development, or after the most recent RESULTS dataset update, have been identified by individual licensees or BCTS during this categorization phase, classed as harvest period 0, and flagged for removal from the analysis phase, as these blocks are considered 'actioned'.

Once an area is classified as planned harvest, and it is not harvest period 0, it is coded as either harvest period 1 or 2 based on participant specific needs. No effort was made during this Plan to 'balance' the harvest flow across the seven-year time frame, it was mainly focused on what is determined feasible to harvest within the defined time frames (considerations included access, existing infrastructure, and capacity)

Where ortho photo verification identified any age class as overlapping a previously harvested area or road, these were reclassified as clearcut and removed from the plan. Age classes 3 to 5 were either removed from analysis or classified as deferred for midterm.

Specific to the retention category, the exercise undertaken to designate these areas in the context of this plan has been a high-level exercise based on strategic datasets. This plan is dynamic and should be expected to change over time. Areas designated as retention are may be non-legal and subject to change at the Forest Licensees' or BCTSs' discretion, as better information becomes available. The areas presented in the 2021 Action Plan are a starting point to a more refined plan to be developed over time, adapting to both a changing environment and potentially changing regulatory framework.

ANALYSIS

Each OSBMT participant provided their final spatial product to the MFLNRORD GIS analyst who combined this data into one Action Plan Feature Class. After errors and consistency issues were dealt with, the data was exported to comma separated value (csv) and further analysis was carried out using R, an integrated suite of software facilities for data manipulation, calculation, and graphical display. No plan is perfect, and during analysis further consistency issues were identified and dealt with a-spatially within the dataset and may not necessarily have been transferred as corrections to the spatial data. For this reason, the values report within this Action Plan document are considered the correct values.

RESULTS

2021 ACTION PLAN OUTPUTS

A total of 184, 240 hectares were classified as either Planned Harvest (PH), Deferred (D) or Retention (R) in this Action Plan. Thirty-seven thousand hectares were categorized in the Mackenzie District while 147, 050 hectares were categorized in the Prince George District. Approximately 72% of all PH, D or R (134, 162 hectares) were within Resultant 3 (spruce leading or secondary Sx >35% and THLB) and 28% (about 50, 000 hectares) was external to Resultant 3. These external areas include spruce beetle severity classes but are not spruce leading stands or spruce as secondary >35%. Figure 10 graphs the action plan results for all severity codes, by OSBMT participant and target versus non-target. Results for these categories are described further below.

After reductions from AOS to Resultant 3, there are

- 134,021 hectares of all severity classes,
  112,366 hectares of this being target stands

Categorized action plan code totals are:

- 50,392 hectares categorized as Planned Harvest
- 49,431 hectares categorized as Deferred,
- 84,418 hectares categorized as Retention (with WTRA added back in)

Figure 9 below shows the total amount of Planned Harvest, Deferred and Retained by severity code and district. The deferred and retained categories make up over two thirds of the total, with approximately equal proportions of severe and very severe infested stands in each. Figure 10 displays the same data but split the results by OSBMT participant and into target or non-target.

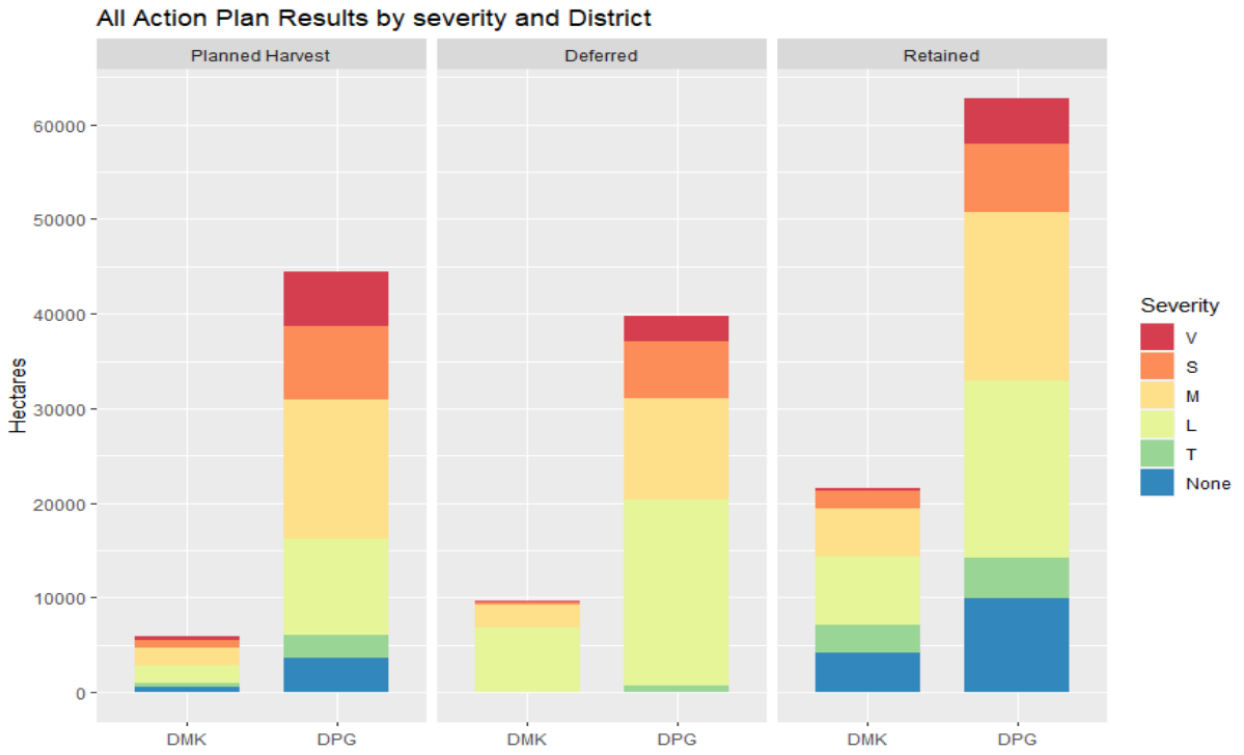

Figure 9 - Action Plan Results by Action Plan Category, Severity and District.

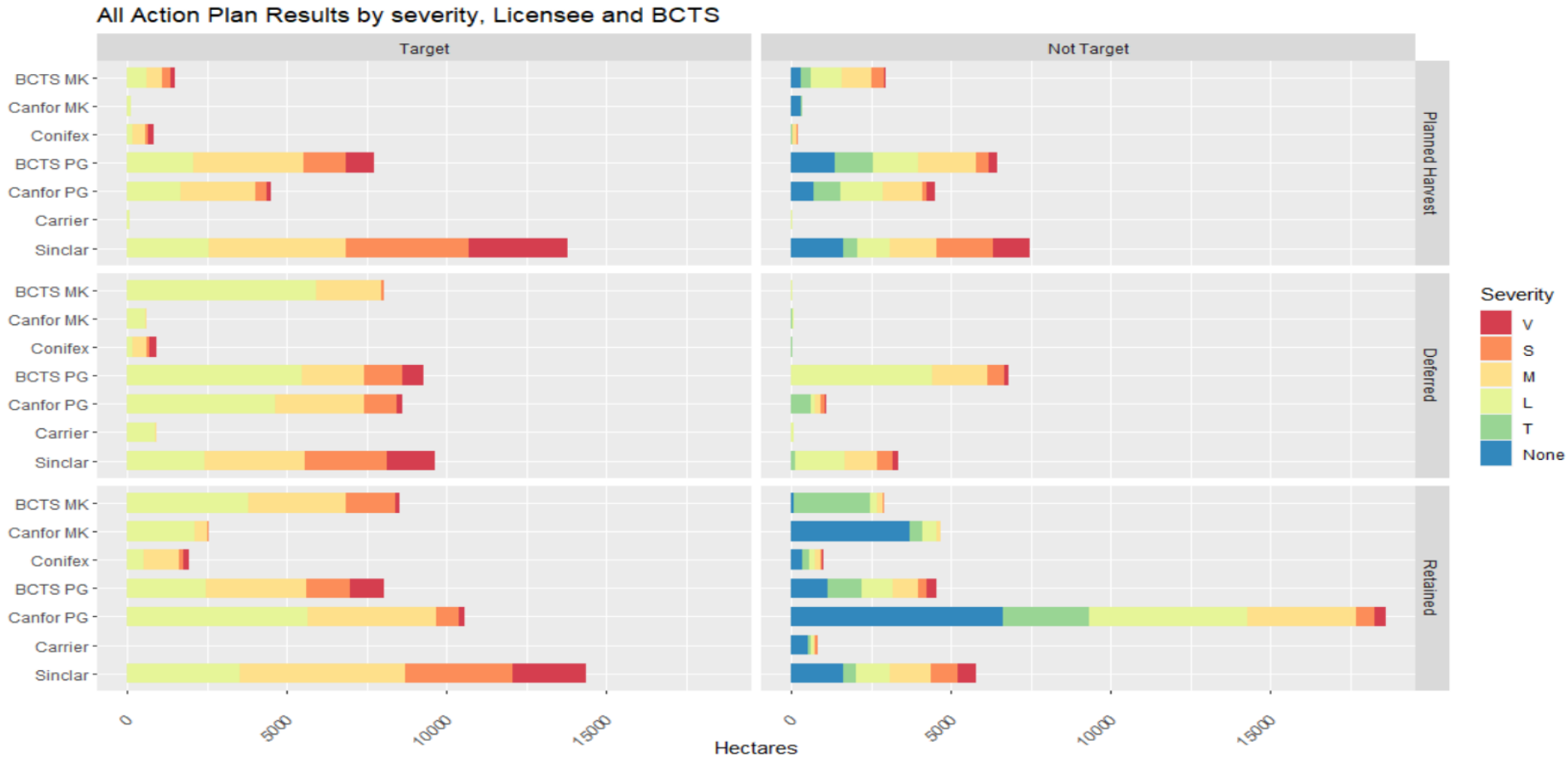

Figure 10 All Action Plan Categories by severity class and split by target and non-target, and Licensee and BCTS. Non AOS included in Reserved is not included in analysis, only included for display purposes. These include landscape level retention considerations.

PLANNED HARVEST

Of the 50,392 hectares of PH, 31, 421 hectares are within Resultant 3 and 18,971 hectares are external to Resultant 3. Ninety percent of the 31,421 hectares within Resultant 3 (28,456 ha) are considered target stands. Almost 8,000 hectares (7,700 hectares) is in Mackenzie and the remaining twenty-six thousand is in Prince George. In the area external to Resultant 3, twelve thousand hectares is low to very severe and age classes 6 to 9. These are stands that were not classified as spruce leading or secondary or THLB but had 'target' severity and age classes. In summary:

PH in Resultant 3 (Sx leading, Sx as secondary, AC 1 to 9, Trace to Very Severe, THLB):

- Total PH is 53, 393 hectares
- 31, 421 hectares is in Resultant 3
- 28, 456 hectares is Target,
- 1, 182 hectares is Trace age classes 6 to 9 and
- 1, 645 hectares is all severity classes in age classes 1 to 5.

PH external to Resultant 3 (Not Sx leading or secondary, AC 1 to 9, Non-AOS, Trace to VS, THLB or Not):

- 13,860 hectares is within the AOS with thirteen thousand hectares of this being Low to Very Severe and age classes 6 to 9, and about 800 ha of trace.
- 5,000 hectares of Non-Resultant 3 AOS of all severity classes (all outside the Resultant, by definition), the majority of this being in PG with 4,453 hectares.

Non AOS harvested as part of the action plan is due to operational harvesting chance, this is only 10% of the total Planned harvest area.

Forty-three percent of Planned Harvest (21,687 hectares) is non-target (Low to Very Severe in non-spruce stands, trace age classes 6 to 9, age classes 1 to 5 and non-AOS). Age class 1 and 2 stands scheduled for planned harvest can be attributed to roads that were included despite the removal of age class 1 and 2 earlier because they are legitimate plans. The condensed action plan results are shown Table 4 and a more detailed breakdown can be found in the appendix.

Table 4 - OSBMT 2021 Action Plan Results. Deferred, Retained, Planned Harvest and Years to Action

COMPANY	AOS - Remaining THLB (all severity and age classes, netted down, Sx leading and Sx secondary >35%)	Subset Target AOS - THLB, L-VS, AC6+, Sx Leading and Secondary	Deferred - AOS (All Severity, All Age Classes)	Deferred - Target AOS (THLB, L-VS, AC6+, Sx Leading and Secondary)	Retained - AOS (All Severity, All Age Classes) In Resultant	Retained - Target AOS (THLB, L-VS, AC6+, In Resultant	Retained - Non AOS (All Age Classes)	Planned Harvested - All	Planned Harvest - All in Resultant	Planned Harvest - AOS (All Severity, All Age Classes, In Resultant)	Planned Harvest - Target AOS (THLB, L-VS, AC6+, Sx Leading and Secondary, In Resultant)	Planned Harvest - All Not in Resultant	Planned Harvest - Age classes 6 to 9, Low to VS Not in Resultant	Planned Harvest - Non AOS, all Age classes, Not in Resultant	AAC as Area (ha) at 305m3/ha (from Table 1)	Years to Action - Planned Harvest - All (years)	Years to Action - Planned Harvest - Target AOS (years)
BCTS MK	21,025	18,029	8,081	8,049	11,228	8,516	69	4,430	1,715	1,715	1,464	2,715	2,152	306	2,951	1.50	0.50
Canfor MK	3,685	3,228	670	598	2,889	2,537	3,720	445	127	127	93	318	8	302	1,375	0.32	0.07
Conifex	3,774	3,643	937	898	2,006	1,937	356	1,021	830	830	808	191	178	0	820	1.25	0.99
DMK Subtotal	**28,484**	**24,900**	**9,688**	**9,545**	**16,123**	**12,990**	**4,145**	**5,896**	**2,672**	**2,672**	**2,365**	**3,224**	**2,338**	**608**	**5,146**	-	-
BCTS PG	34,708	25,002	16,066	9,276	9,359	8,018	1,140	14,151	9,283	9,283	7,708	4,868	2,913	1,346	2,951	4.80	2.61
Canfor PG	27,173	23,710	9,698	8,620	12,431	10,575	6,607	8,992	5,044	5,044	4,514	3,948	2,871	702	2,619	3.43	1.72
Carrier	1,067	980	985	914	0	0	533	82	82	82	65	0	0	0	213	0.38	0.31
Sinclar PG	42,589	37,774	12,993	9,624	15,398	14,350	1,974	21,271	14,340	14,204	13,804	6,931	4,247	2,405	2,459	8.65	5.61
DPG Subtotal	**105,537**	**87,466**	**39,742**	**28,434**	**37,188**	**32,943**	**10,254**	**44,496**	**28,749**	**28,613**	**26,091**	**15,747**	**10,031**	**4,453**	**8,242**	-	-
Total	**134,021**	**112,366**	**49,430**	**37,979**	**53,311**	**45,933**	**14,399**	**50,392**	**31,421**	**31,285**	**28,456**	**18,971**	**12,369**	**5,061**	**13,388**	-	-

The planned harvest category was segmented into two harvest periods. The first, harvest period 1, was from 2021 to 2024 inclusive. These primarily included blocks that were either permitted or in current development. Harvest period 2 was from 2024 to 2028. These are areas primarily slated for recce and future development. The total amount of area identified for harvest in each harvest period is shown in Table 5**.** Approximately 54% of harvest period 1 consists of target stands. For harvest period 2, this proportion is 59%. Figure 11 differentiates planned harvest by severity class as well.

Table 5 - Planned Harvest by Harvest Period

District	Harvest Period 1 (2021 - 2024)		Harvest Period 2 (2025 - 2028)		Sum of Harvest Period 1 (2021 - 2024)	Sum of Harvest Period 2 (2025 - 2028)	Total all harvest Periods
	Not Target	Target	Not Target	Target			
DMK	3448	1838	85	527	5286	612	5898
DPG	10202	14296	8136	11794	24498	19930	44428
Total	**13650**	**16134**	**8221**	**12321**	**29784**	**20542**	**50326**

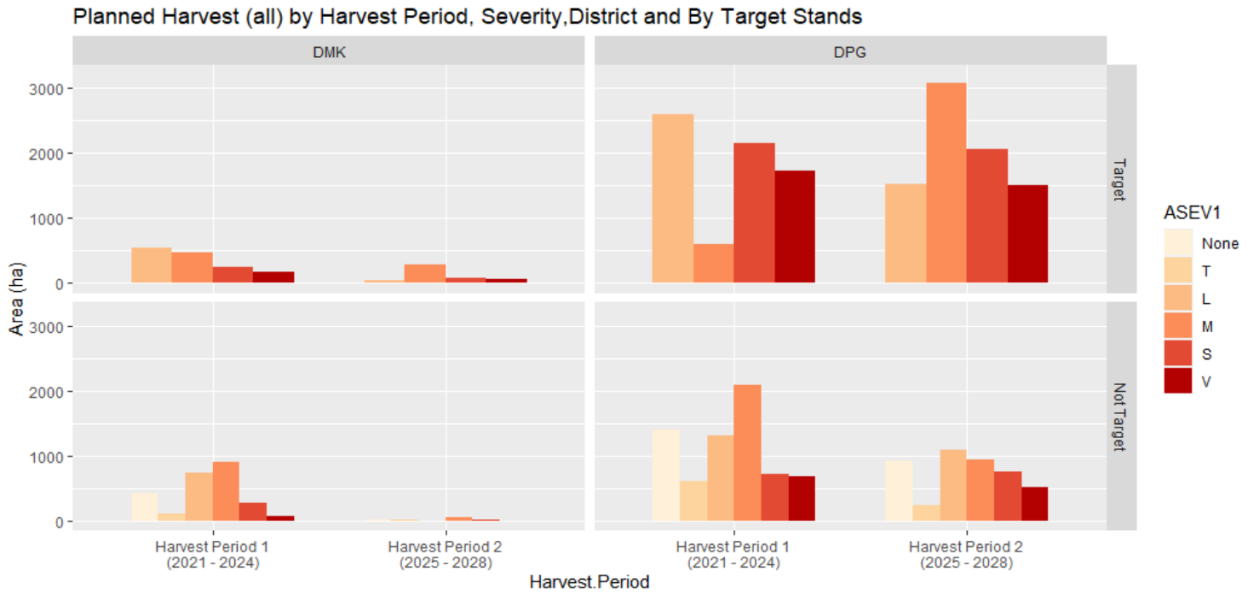

Figure 11 - Planned harvest by severity class, harvest period, district and split by target and non-target. Most S and VS stands in Mackenzie are addressed in Harvest period 1. Prince George has a mixture of severity classes on both harvest periods, most likely attributed to development lag time.

DEFERRED

There were 49, 431 hectares of Deferred. Approximately 20% (9, 688 hectares) of this area was located in the Mackenzie NRD and 80% (39, 743 hectares) was located within the Prince George NRD. Of the total deferred, approximately 37, 979 hectares were target stands. Figure 12 graphs the deferred by severity class and whether it is considered target or not based on species, age class, severity and THLB. There is a large amount of moderate and low attack deferred in Mackenzie, but very little higher severity classes, almost all of which is considered target. In Prince George, over half of the deferred target stands are severe and very severe attack.

Figure 13 shows why the area was deferred. There could be multiple constraints causing one particular area to be deferred, resulting in double counting of Action Plan area within this figure. In Mackenzie, constraints were limited to mainly pending legal, midterm and partition, with small amounts of inoperable and access issues. In Prince George, midterm and legal were the leading reasons for deferral, with access being a larger issue than in Mackenzie. For Prince George, ESI and First Nations accomodations were significant as well.

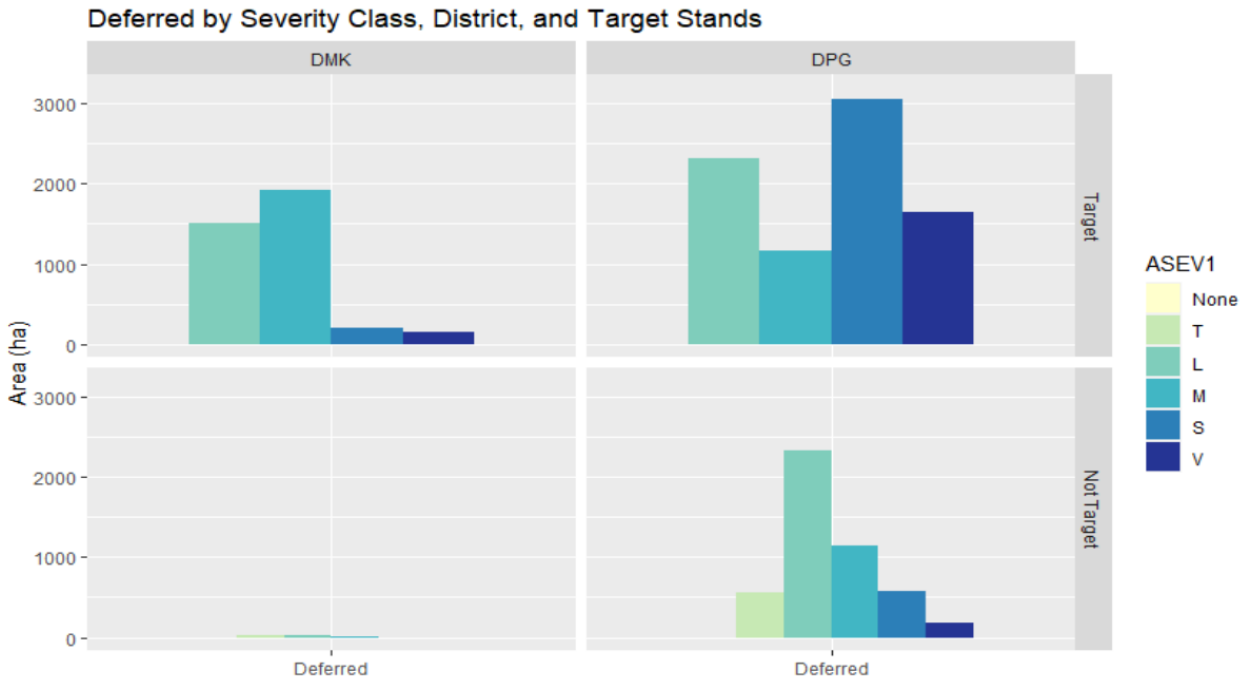

Figure 12 - Deferred stands by severity, target status, and district.

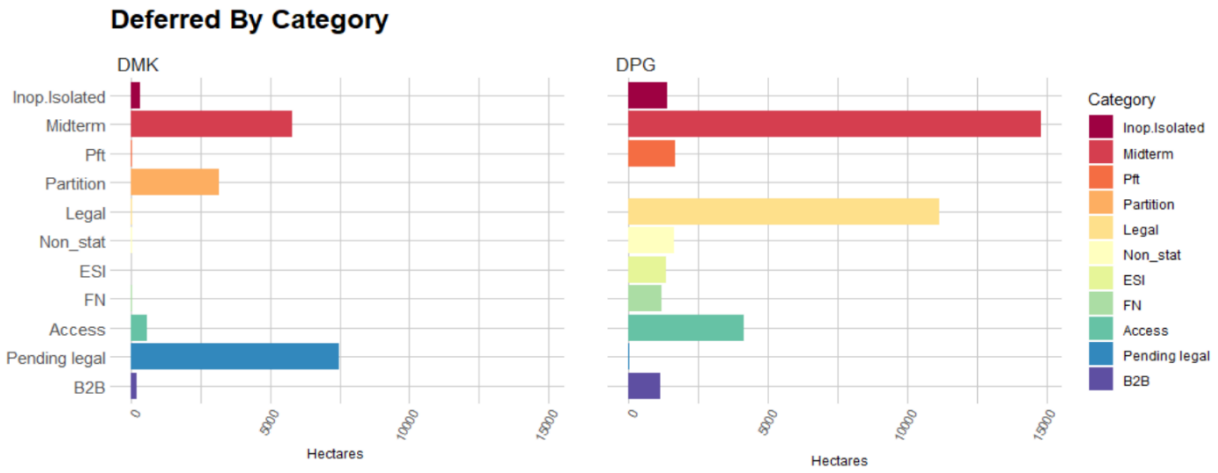

Figure 13 - Deferred by Constraint. Area of overlapping constraints occur within the Action Plan.

RETENTION

There are 84, 418 hectares classified as Retention within the Action Plan. 53, 311 hectares were within the Resultant, 84% of which are target stands. The remaining 31,106 hectares are made up of the following categories:

- WTRA with severity classes external to the Resultant (8,061 ha),
- WTRA without severity classes external to the Resultant but retained as part of an actioned block from previous years (8,426 ha),
- All severities and all age classes external to the resultant and not in a WTRA (8,907 ha), and finally,
- stands without severity and retained outside of the resultant (5,712 ha). These may also be associated with legal WTR but not classified as such at the time of the plan or may be Landscape level retention such as A25 or A4.

Figure 14 graphs the retained area by severity class and whether it is considered target or not based on species, age class, severity and THLB. Much of the retained target stands in Mackenzie are classed as severe and Very Severe. Significant non-target retained in Mackenzie consist of approximately 1,200 hectares of WTRA and approximately 3,000 hectares of non-AOS, non-WTRA. This last category is not included in the analysis but occurred through planning exercises for individual participants and has not affected on the results. In Prince George, much of the retention is in the very severe target category, reflective of the multiple constraints occurring in the NRD.

Figure 15 below shows the constraints that lead to why Target stands were classified as Retained. Each spatial polygon may have more than one constraint affecting it. In Mackenzie, the primary reason for retention rather than harvest of affected target stands was non-statutory constraints. In Prince George, the main constraints leading to retention of target stands was one of 6 legal constraints. In addition, First Nations interests, including ESI, inoperability, pending legal, and non-statutory reasons stand out. Most constraints have only one or two sub-categories, but the legal category has six.

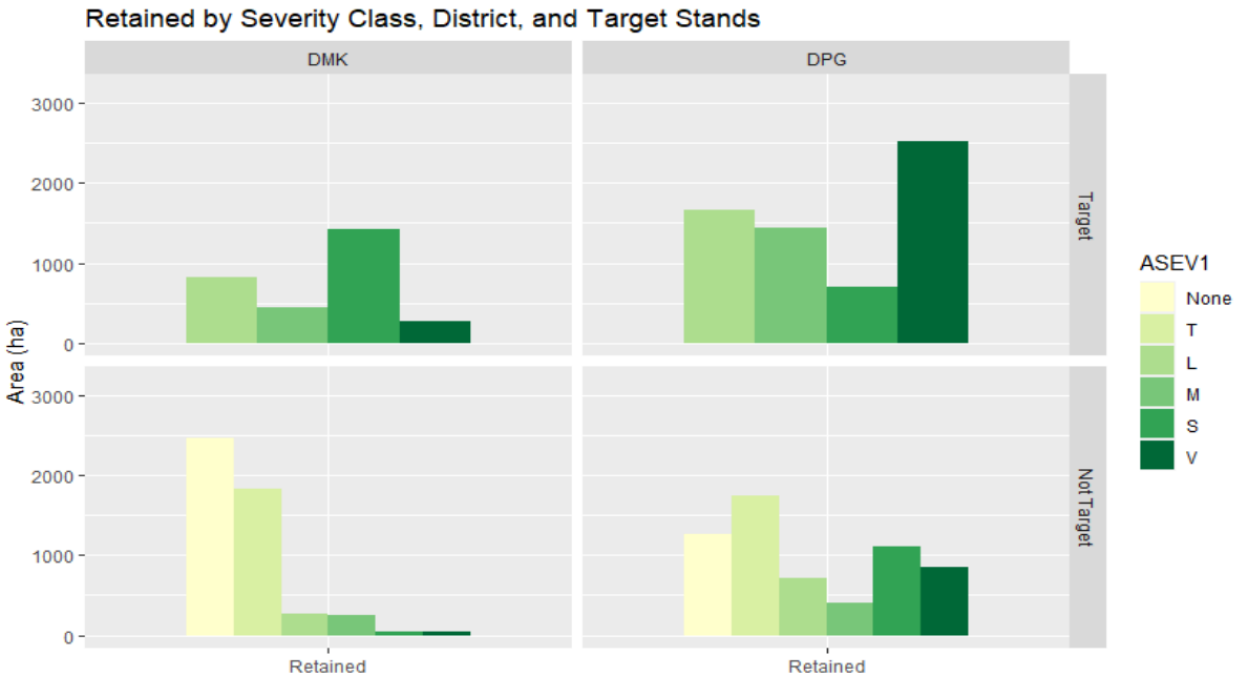

Figure 14 - Retained by Severity, Target status and district.

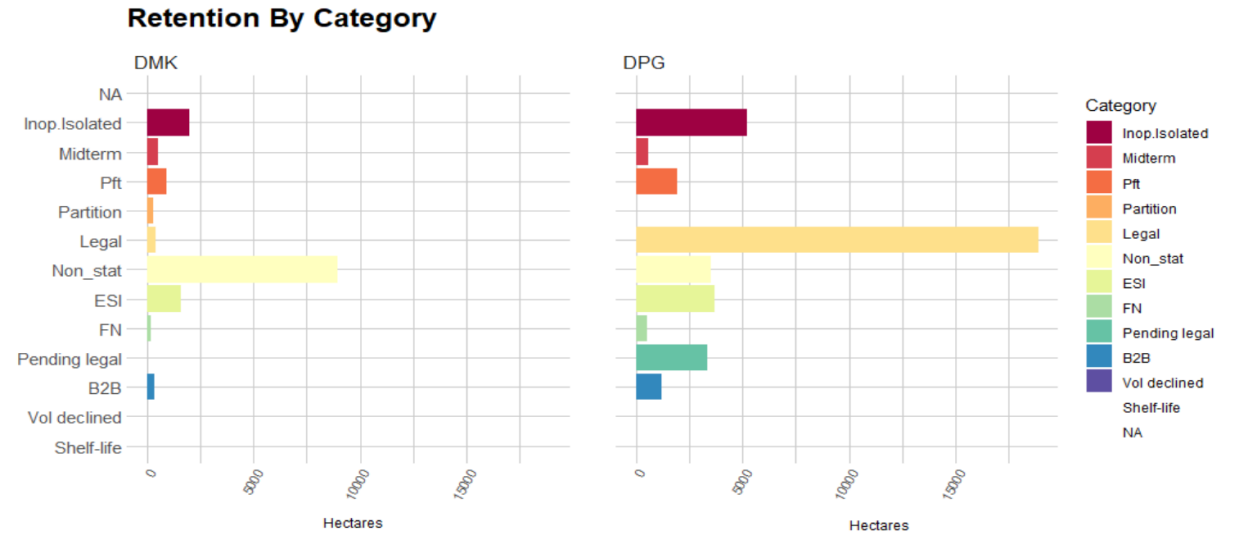

Figure 15 - Retention by Constraint. Area of overlapping constraints occur within the Action Plan.

Figure 16 below splits the legal constraint by legal category, action plan code, and NRD. As shown, the Landscape Biodiversity Order (LBO) is the leading legal constraint causing retention of target stands in Prince George while the UWR is the highest for Mackenzie. Specific to the deferred stands due to legal constraints, Prince George stands were deferred primarily because of the LBO, and in Mackenzie, constraints other than legal caused more area the be deferred (note scale). In particular, the caribou moratorium supported deferral of over 7,000 hectares, the

partition influenced deferral as well, as did midterm.

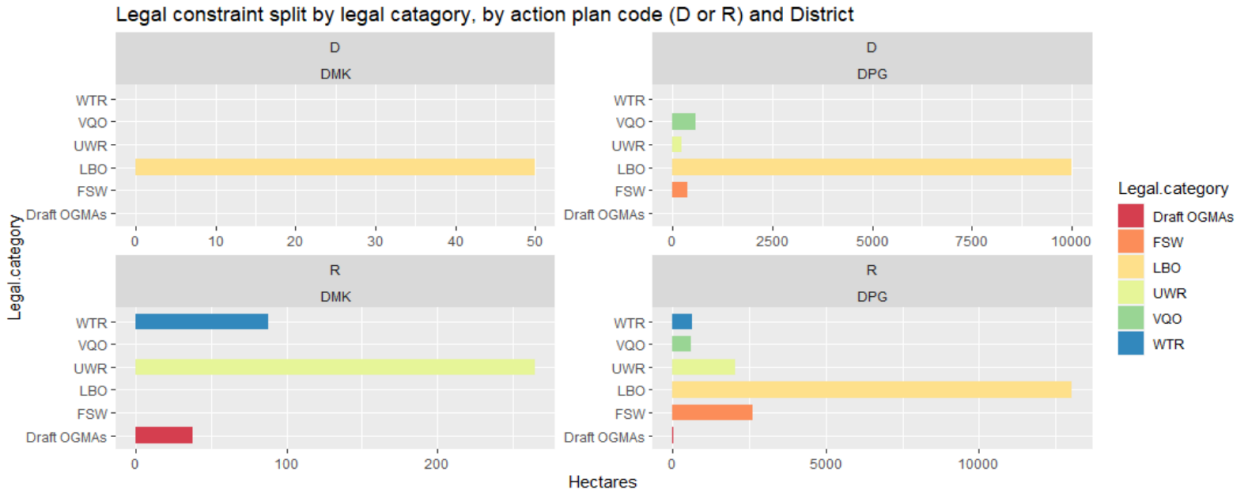

Figure 16 – NRD specific Legal Constraint Category for Deferred and Retention, split by each legal constraint.

Non-statutory constitutes 8,978 ha in DMK and 4,505 ha in DPG. The majority of this non-statutory was deferred or reserved to accommodate the CF's retention guidance. Much of the Legal retention also contributes to Chief Forester's Retention Guidance. The CF's category was typically used as a default 'intra-patch' remnant category. Others used legal '3' has this default code. Remaining patches can contribute to lld forest areas for LBO purposes.

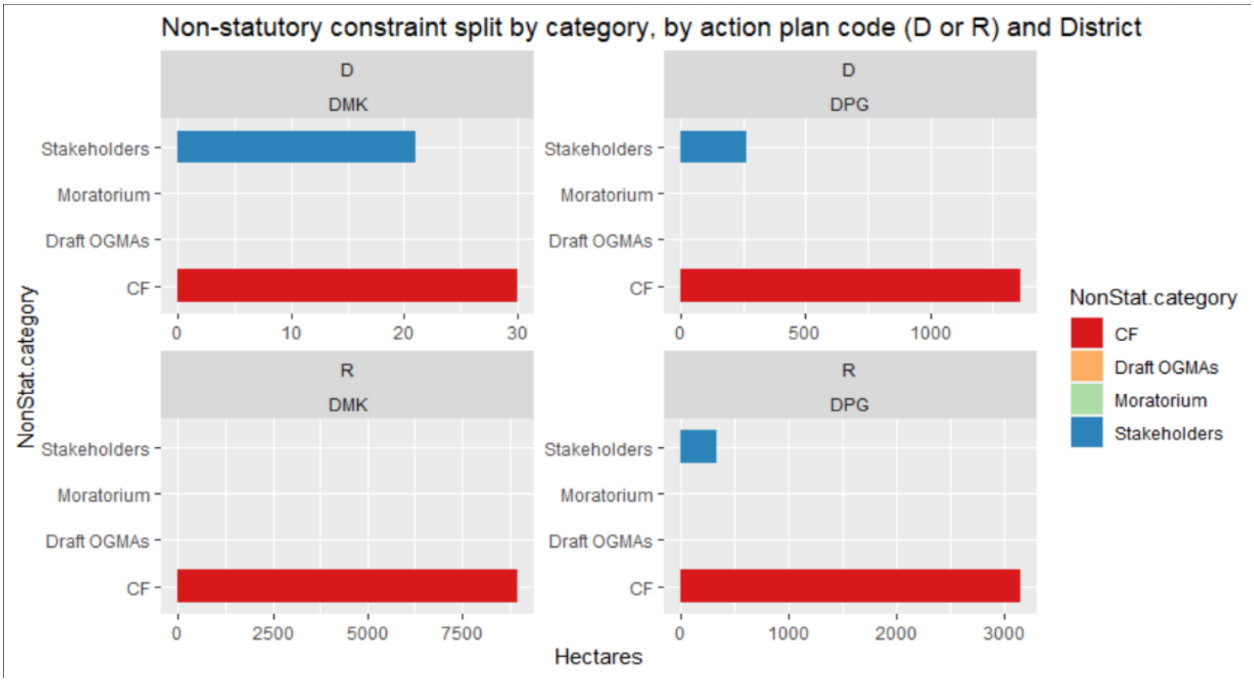

Figure 17 NRD specific Non-Statutory Category split by Action Plan Code and Constraint

Figure 18 shows the area with number of constraints to it for deferred and retained stands. There are twenty thousand hectares of deferred stands with only one constraint, 14,983 ha with two constraints, up to 45 hectares

with 5 constraints. The vast majority of retained stands have only one constraint applied to them, although not identified, most areas do face multiple constraints.

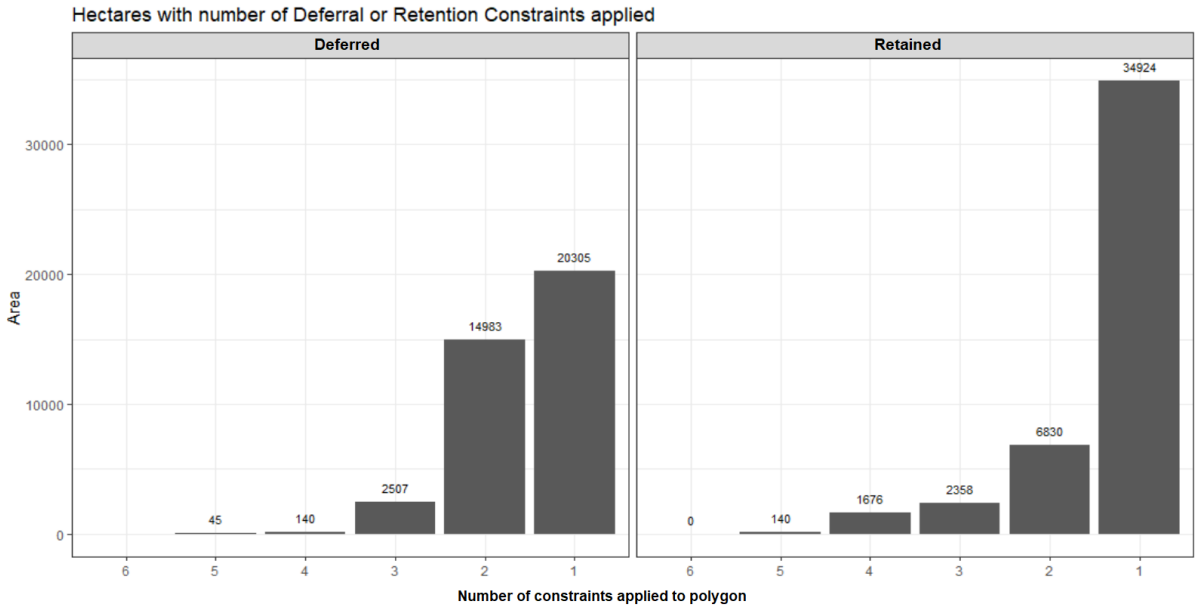

Figure 18 Number of Constraints applied to Target stands.

ACTION PLAN SUMMARY – TIMELINES

To determine the amount of time it will take to address all the target stands, the total area of target stands within each Licensee or BCTS operating area is divided by the AAC as area for each licensee or BCTS. Table 5 shows the AAC as area, the total area of target stands, and the 'Years to action planned harvest AOS'.
Within the plan time frame:

- Mackenzie **unconstrained target stands** will be actioned within the next year
- PG **unconstrained target stands** can all be addressed within 6 years or less if all licensees or BCTS focus on most damaged stands.

Figure 19 - Target Planned Harvest by severity class, OSBMT participant, showing years to action by severity class. This figure shows target planned harvest by severity class, licensee or BCTS, and annotation lists years to action each severity component. Table 6 shows the distribution of the planned harvest area and by the estimate number of years to action that each severity class (i.e. the distribution of severity class within planned harvest).

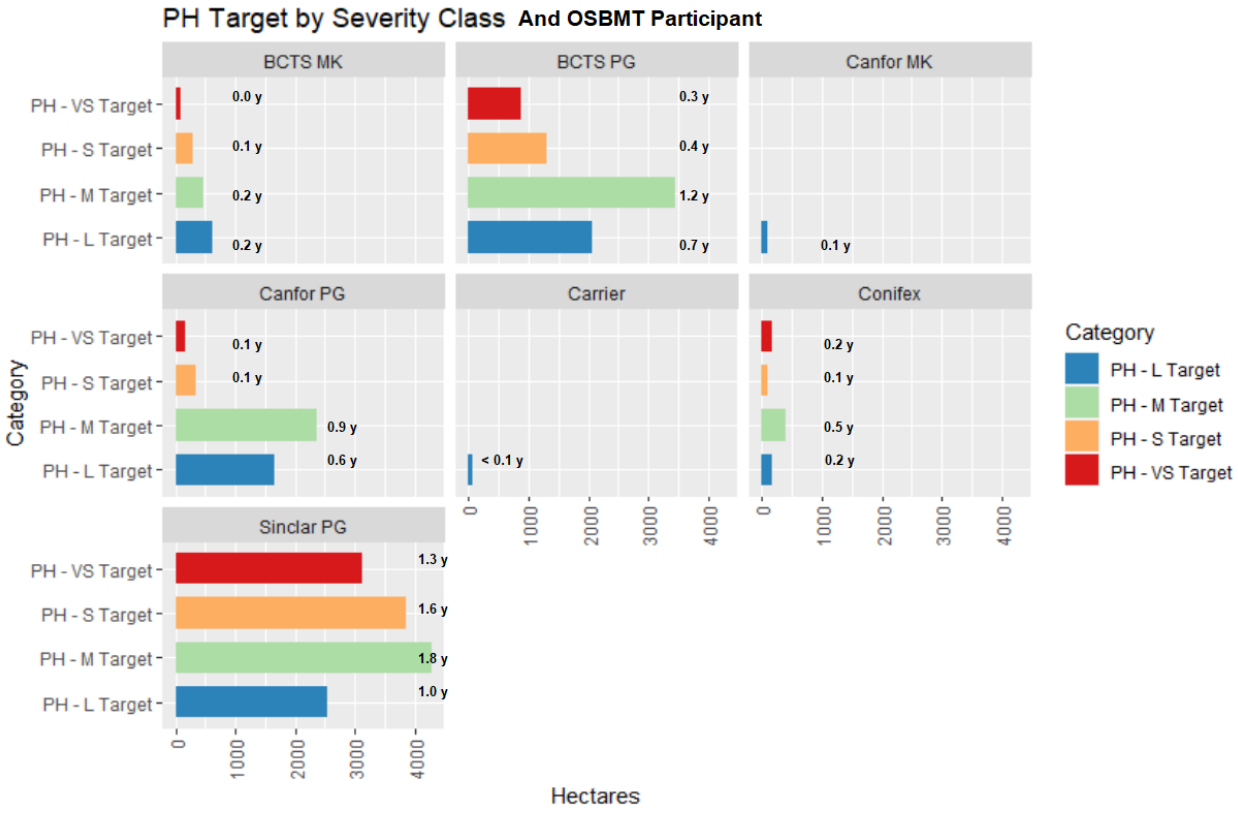

Figure 19 - Target Planned Harvest by severity class, OSBMT participant, showing years to action by severity class.

Table 6 - Planned Harvest by Severity and Years to Action

COMPANY	AOS - Remaining THLB (all severity and age classes, netted down, Sx leading and Sx secondary >35%)	Subset Target AOS - THLB, L-VS, AC6+, Sx Leading and Secondary	Planned Harvest - All	Planned Harvest - All, In Resultant	Planned Harvest - Target AOS (THLB, L-VS, AC6+, Sx Leading and Secondary, In Resultant)	Planned Harvest - Target, Low, In Resultant	Planned Harvest - Target, Mod, In Resultant	Planned Harvest - Target, Severe, In Resultant	Planned Harvest - Target, V.Severe, In Resultant	AAC as Area (ha) at 305m3/ha	Years to Action - Planned Harvest - All (years)	Years to Action - Planned Harvest - Target Low (years)	Years to Action - Planned Harvest - Target Moderate (years)	Years to Action - Planned Harvest - Target Severe (years)	Years to Action - Planned Harvest - Target V.Severe (years)	Years to Action - Planned Harvest - Target AOS (years)
BCTS MK	21,025	18,029	4,430	1,715	1,464	609	462	302	92	2,951	1.5	0.2	0.2	0.1	0.0	0.5
Canfor MK	3,685	3,228	445	127	93	93	-	-	-	1,375	0.3	0.1	0.0	0.0	0.0	0.1
Conifex	3,774	3,643	1,021	830	808	157	390	100	161	820	1.3	0.2	0.5	0.1	0.2	1.0
DMK Subtotal	**28,484**	**24,900**	**5,896**	**2,672**	**2,365**	**859**	**852**	**402**	**253**	**5,146**	**3.1**	**0.2**	**0.2**	**0.1**	**0.1**	
BCTS PG	34,708	25,002	14,151	9,283	7,708	2,067	3,463	1,313	865	2,951	4.8	0.7	1.2	0.4	0.3	2.6
Canfor PG	27,173	23,710	8,992	5,044	4,514	1,661	2,360	339	155	2,619	3.4	0.6	0.9	0.1	0.1	1.7
Carrier	1,067	980	82	82	65	65	-	-	-	213	0.4	0.3	0.0	0.0	0.0	0.3
Sinclar PG	42,730	37,774	21,271	14,340	13,804	2,543	4,291	3,844	3,125	2,459	8.7	1.0	1.8	1.6	1.3	5.6
DPG Subtotal	**105,678**	**87,466**	**44,496**	**28,749**	**26,091**	**6,336**	**10,114**	**5,496**	**4,145**	**8,242**	**17.3**	**0.8**	**1.2**	**0.7**	**0.5**	
Total	**134,162**	**112,366**	**50,392**	**31,421**	**28,456**	**7,195**	**10,966**	**5,898**	**4,398**	**13,388**	**20.3**	**0.5**	**0.8**	**0.4**	**0.3**	

DISCUSSION

2021 ACTION PLAN CATEGORIZATION

Some of the results above require further discussion. This section provides comment on the harvest impact on spruce beetle, harvesting of target stands, the harvest prioritization matrix, harvesting of non-target stands, more context on deferred and retained categories, how WTRA has been categorized, and years to action.

We also respond to the RED expectations including the Chief Forester Retention and harvest prioritization matrix guidance documents, metrics for annual reporting, non-recoverable losses, representative harvest in all forest stands as well as considerations for ESI.

ACTION PLAN PLANNED HARVEST

HARVEST IMPACT ON SPRUCE BEETLE

There are over 900,000 hectares of area in the accumulated aerial overview survey with some form of spruce beetle impact. Some of this is error, however the majority of the infestation is in non-THLB. Only a quarter of the total AOS was assessed in this action plan, and less than a quarter of that is unconstrained and able to be harvested. To describe this in another way, there are approximately 733,000 hectares of spruce beetle impacted stands in the Omineca that will not be harvested.

HARVESTING OF TARGET STANDS

The Action Plan results show that just over fifty thousand hectares is being planned for harvest. Thirty-one thousand of this is within Resultant 3. Of these 31 thousand hectares, 28 thousand hectares occur in yarget stands. This leaves almost 19 thousand hectares in either non-spruce leading/secondary stands or non-THLB. For areas external to the resultant, the OSBMT did not differentiate between THLB and non-THLB, so some of this 19 thousand could be non-THLB. AsVRI was used to classify stands into spruce and non-spruce categories, a portion of the 19 thousand may be spruce leading but not be classified as so in VRI. Over 12 thousand hectares is low to very severe but not in spruce leading stands (or possibly THLB).

Stands in the infestation area are typically mixtures of subalpine fir and spruce, and VRI polygons do not readily match harvest boundaries or vice versa. Much of these non-spruce leading or secondary stands may be only 1 or 2 percent off making the ‘target’ criteria. Aside from VRI inaccuracies, the AOS severity classes are coarse filter provincial coverage and not designed for stand level decisions. The areas identified as planned Hhrvest external to the target ‘AOS’ and ‘VRI’ subsets are strategic landscape level decisions to pursue further work on determining whether the AOS and VRI were correct or not.

HARVEST PERIOD AND STAND PRIORITIZATION

There are a mixture of severity classes and stand types in each harvest period. Harvest period 1 mainly contains the previous 2 years of planning and is primarily under permit or contained within a developing or developed TSL. In relation to the distribution of AOS severity classes seen in Harvest Period 2, this can be accounted for by the fact that Harvest Period 1 is authorized or soon to beat the time the Action Plan is developed.

NON-TARGET STANDS WITHIN PLANNED HARVEST CATEGORY

The 2021 Action Plan encompasses area outside of AOS polygons. As demonstrated in Table 5, only 10% of the planned harvest category is non-target. The intent of the spatial retention and harvest plan components of the 2021 Action Plan is to produce a tactical plan, as requested in the RED Expectations Letter to Licensees. A tactical plan, if taken to be synonymous with an operational plan, cannot be confined solely to the AOS polygons, as the AOS coverage is a non-operational input.

As demonstrated in Figure 6 above, the variety of non-AOS and non-Resultant 3 severity classes speaks to the challenges of targeting AOS and VRI areas, investing in development, probing, and cruising, and coming up short on strategic targets. Harvest period 2 identifies which stands are the next priority for field verification based on the current AOS severity classes. Access constraints also limit the ability of all the most severely impacted stands to be included in harvest period 1. It is important to remember that this plan is a snapshot in time based on strategic level inputs and change should be anticipated.

ACTION PLAN DEFERRED & RETENTION

The 2021 Action Plan, while focused on spruce beetle infestation areas, must also address the other non-timber values that occur on the land base in addition to considering operational constraints and logical harvest unit boundaries. Contrary to the situation during the MPB infestation, none of the constraints, either legal or related to social license or certification were relaxed when the spruce beetle infestation began. MoFLRNRORD has been explicit in messaging that all the FRPA values must still be met on the land base within the infestation area. Many polygons are affected by multiple constraints, causing them to be categorized into either Deferred or Retention.

The Action Plan also demonstrates that biodiversity through retention and deferral of impacted areas constitutes well over half of the Action Plan area. Fully 50 thousand hectares is being retained in this plan and an additional 34,000 hectares has been brought forward as legal WTRA to be retained for a full harvest rotation associated with the spruce beetle outbreak area. These 84 thousand hectares, added to the netted-out areas of the AOS (non-THLB, etc.) adds significant area to the retention bucket and is evidence that legal as well as non-legal frameworks for biodiversity management are working at both stand and landscape scales.

Deferred areas account for 49 thousand hectares of target stands, 37 thousand of which are target stands. As shown in Figure 13 above, mid-term timber supply is a significant factor in the deferred category. In addition, the LBOs and pending legal categories also contribute significantly to this bucket. The legal constraints are areas that are required to be deferred to comply with the current regulatory framework. There is a level of uncertainty associated with the timing of when stands could potentially become available for harvest. Areas contained within the interim moratorium are anticipated to be permanently removed from the THLB, while partition areas may become available to harvest within the Action Plan timeframe. Legal LBO constraints are more dynamic and have the potential to be included in the harvest profile based on analysis through the LLOWG group. The mid-term constraints encompass both lower severity stands and younger age classes which will comprise a significant proportion of future harvest stands. No matter what the reason for deferral, these stands also contribute to the Chief Forester's Retention Guidance, as discussed below.

LEGAL WTRA

During the netdown process, the gross cutting authority area (FTA cutblock layer) was removed from AOS using a coverage created from Forest Tenures Administration data for approved cutting permits. While important to remove previously harvested area, the flaw with this netdown occurs in that wildlife tree retention areas (WTRA) are

included within the FTA cutblock area. To accurately reflect where mature stands have been left on the landscape, this legally designated WTRA was brought back into the plan after the netdown process was completed and has been categorized as Retention with an attribute code of 7 to indicate legally designated retention identified within a site plan. This process resulted in approximately 16 thousand hectares of retention being brought back into the plan after its initial removal due to the use of the FTA cutblock layer in the netdown process.

This is a significant amount of area and is important to represent in the plan. This area was spatially represented in the 2020 Action Plan on the map products using a consolidated licensee WTRA layer but was not consistently included by each OSBMT member in the 2020 Action Plan's spatial dataset. This has been rectified within the 2021 Action Plan and the legal WTRA is now represented on both the map products and within the analysis of spatial data provided within this Action Plan.

An important principle of stand level retention is that it be representative of the stands that are being harvested. In addition, the Chief Forester's guidance on stand level retention is clear that stand level retention should be increased within areas of significant infestation. These two factors explain why the full range of severity classes, both spruce and non-spruce leading stands and un-infested stands are represented within the legal WRTA designation. In cases where the WRTA had been removed from Resultant 3, the OSBMT needed to work backwards to re-assign severity classes, stand composition and age class attributes. Some planned harvest blocks will have areas that are slated to become legal WTRA and since the blocks do not yet exist within the FTA coverage, these areas are still present within Resultant 3. This disconnect occurs because of the timing of when the different coverages were created for use in the Action Plan.

Similar to the planned harvest areas, a component of Non-AOS and non-resultant 3 AOS were included in the Retention category because the values that were being considered for retention areas were not solely focused on spruce beetle. Patch size breaks, caribou corridors, etc. are planned to benefit retention of suitable habitat and representative stands on the land base and forest health factors do not significantly impact the ecosystem function of these stands for those purposes.

LANDSCAPE BIODIVERSITY ORDERS

Analysis of the impacts to the Landscape Biodiversity Orders was not carried out in this plan. Review of the analysis conducted for the 2020 Action Plan indicates that the Action Plan can be achieved while remaining consistent with the Landscape biodiversity targets set for each respective NRD. The 2021 Action Plan is built based on the constraints in place related to the Landscape Biodiversity Orders.

OTHER LANDSCAPE LEVEL PROCESSES

The other landscape level planning initiatives underway within the Omineca region must also be considered when developing a tactical plan. The implications of ongoing implementation of the Environmental Stewardship Initiative (ESI) have far ranging timber supply effects. This is happening in concert with a MoFLNRORD timber supply apportionment decision and a licensee led operating area reallocation process which have the potential to change the distribution of the OSBMTs operating areas significantly. The potential reallocation of AAC stemming from the apportionment decision introduces more uncertainty into future plans.

Within Mackenzie, a large proportion of the deferred category falls within either the partition area associated with Mackenzie TSA TSR 4 decision or the interim moratorium area designated through the Intergovernmentalal Partnership Agreement for the Conservation of the Central Group of the Southern Mountain Caribou (IPAC). These

designations are assigned by MoFLNRORD and both licensees and BCTS are following MoFLNRORD direction when deferring harvest for spruce beetle within these areas. There are approximately 5900 ha deferred in the interim moratorium area and 8900 ha retained. There were 3200 ha deferred in the partition area and 2100 ha retained. As shown in Figure 20 below, close to half of the interim moratorium area is low severity, with the other half comprised of moderate and severe with a small component of very severe severity ranks. Most of the partition area is within low severity polygons.

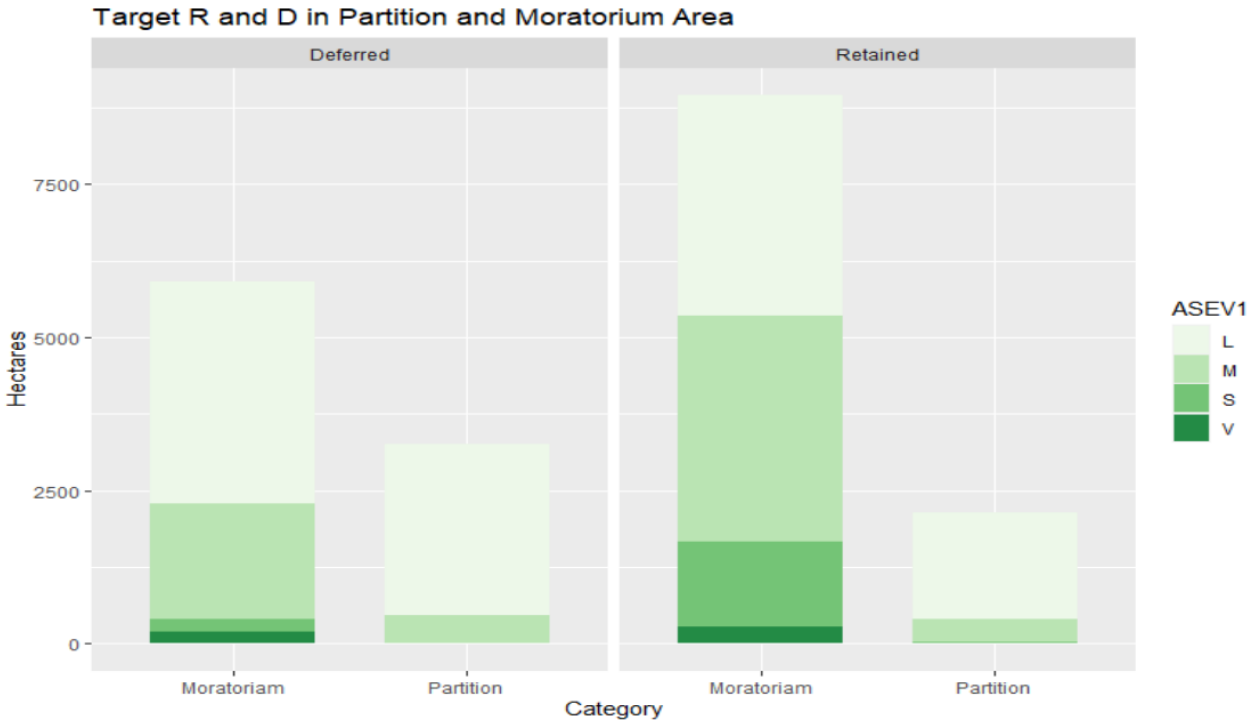

Figure 20 - Target stands within Partition and Moratorium Areas by severity class.

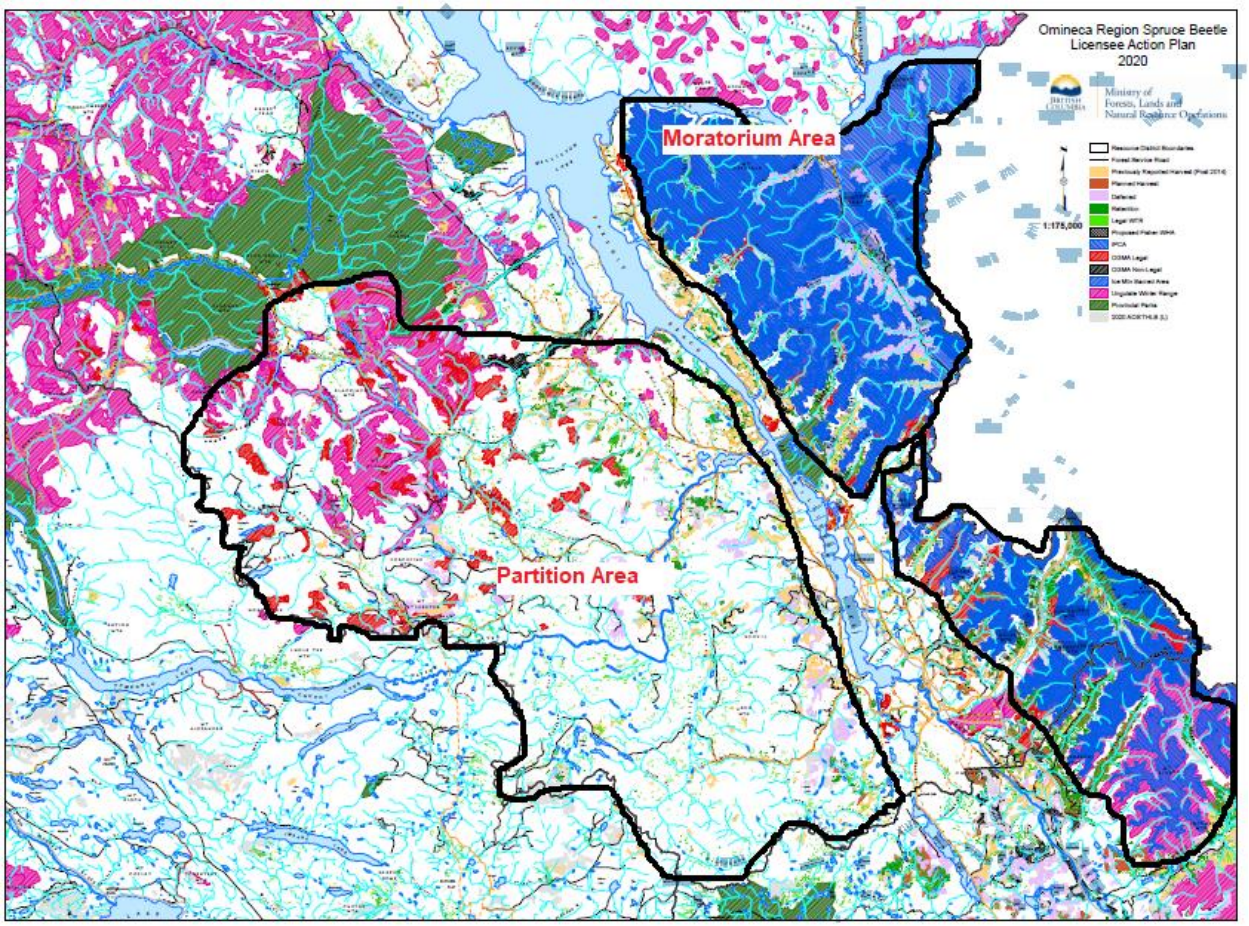

Figure 21 General Area of Partition and Caribou Moratorium Areas as shown on Action Plan DMK Map with Restrictions.

YEARS TO ACTION AND AAC RATIONALE

The time required to theoretically action all the unconstrained target stands was shown in Table 4 and Table 5. Though two values are provided: 'Years to action all', and 'years to action target'. The first represents the theoretical harvesting chance with a focus on AOS spruce beetle impacts. The second represents the portion of the total that has been determined to be the target harvest profile: THLB, merchantable age classes and trace attack removed. While focusing on the target stands, new data and ground verification may add portions of the non-target to the target profile. The 'Years to Action all' demonstrates that the majority of the PH is achievable despite addition of all non-target if they turn out to be target during verification.

Licensee AAC Capacity (Table 1) has been provided again in 2021 to ensure that the proportion of OSBMT AAC being directed towards the spruce beetle infestation is transparent. Throughout all iterations of the Action Plan, OSBMT has been forthright in acknowledging that it is not feasible to direct 100% of the entire AAC towards the infestation.

The rationale for this is almost entirely related to operational issues that would not necessarily come to light during strategic level exercises. The capital investment for harvesting contractors to re-configure equipment to operate in the profiles afforded by the spruce beetle infested stands is considerable, and these stands are often located on more challenging terrain than has been dealt with in recent years. This transition is in progress, but it is a process that is still ongoing, even 5 years into the infestation. This is combined with a general shortage of harvesting capacity due to lowered productivity within the geographic areas where the infestation is occurring.

The operating areas most heavily infested by spruce beetle also do not provide for reliable access to suitable summer ground to utilize the full AAC available while maintaining consistent fibre flow to milling facilities. These geographic areas are accessed by older infrastructure and the road systems, which were designed for much different trucking configurations, have the potential to present a safety hazard should an excessive concentration of harvesting occur. Community and social license considerations preclude large scale movement of operations into the infestation area, in contrast with the actions taken during the mountain pine beetle infestation. It is also important to note that salvage harvest of mountain pine beetle damaged stands is still occurring and should be a priority to ensure that the economic value of that timber is not lost.

Damaged stands do not necessarily match processing facility requirements for profile and wood quality to meet customer needs. The lumber and grade outputs required to meet customer demand and maintain a viable operation preclude a full diet of damaged stands. The approximate years to action contained Table 4 (OSBMT Action Plan Results – Planned Harvest, Deferred, Retained and Years to Action) have, for the most part, decreased in the 2021 Action Plan in relation to the 2020 Action Plan. This decrease in years to action can be attributed to the drop in AOS area that is needing to be addressed, refinements to the categorization process employed by the OSBMT, and past harvesting efforts.

The 2021 Action Plan Years to Action metric is independent of which harvest period and severity class. It is simply planned harvest area divided by AAC area. Figure 19 - Target Planned Harvest by severity class, OSBMT participant, showing years to action by severity class.Figure 19 shows the target planned harvest by OSBMT member by severity class and years to action those areas, independent of what harvest period they are situated in. Table 5 and Figure 19 demonstrate that all licensees and BCTS can action all of their impacted stands in less than 7 years. If taking into account the non-target planned harvest, only one licensee is over the 7 year ‘time frame’. Due to uncertainty inherent in the Action Plan data inputs, along with uncertainty created by MoFLNRORD led landscape level planning initiatives that will result in timber supply impacts that licensee is satisfied that the actionable target stands will be addressed in a timely manner and no additional strategies or assistance is required.

COMPARISON 2020 TO 2021 YEARS TO ACTION

When comparing the 2020 to 2021 years to action, the years to action metric has mostly gone down as indicated in the change columns in Table 7. Where planned harvest all is going down, but change in target goes up, this shows an increase in the proportion of target within all harvest. In general, there has been a decreasing trend in years to harvest. Assumptions and modifications to categorization add to the change between the two action plan results as do disproportionate regional beetle impacts.

Table 7 Years to Action Comparison - 2020 versus 2021 Action Plan. Negative number indicates decrease.

COMPANY	2020 Planned harvest all	2020 Planned harvest target	2021 Planned harvest all	2021 Planned harvest target	(2020-2021) Change Planned Harvest all	(2020 – 2021) Change Planned Harvest Target
BCTS MK	4.2	2.4	1.5	0.5	(2.70)	(1.9)
Canfor MK	0.3	0.1	0.32	0.07	0.02	(0.0)
Conifex	0.9	0.9	1.25	0.99	0.35	0.1
BCTS PG	6	4.7	4.8	2.61	(1.20)	(2.1)
Canfor PG	3.2	2.6	3.43	1.72	0.23	(0.9)
Carrier	4.1	3.2	0.38	0.31	(3.72)	(2.9)
Sinclar	8.3	6.8	8.65	5.61	0.35	(1.2)

While AAC numbers have remained mostly static, the geographic distribution of where the AAC is being applied has shifted due to other MoFLNRORD led landscape level planning initiatives. These have added a layer of complexity not seen in the previous iterations of the plan.

The 305m^3/ha conversion factor used to convert AAC into area was not updated for the 2021 Action Plan to ensure consistency with the previous iterations. The realized volume per hectare for spruce beetle infested stands is expected to trend downward in the infest area, based on licensee and BCTS data on future harvest stands. If the realized volume changes significantly, there will be implications for the years to action calculation and the plan overall. In future plans, further analysis should be undertaken to determine if the volume per hectare assumptions are still accurate.

REGIONAL EXECUTIVE DIRECTOR'S (RED) EXPECTATIONS LETTER

STAND AND LANDSCAPE-LEVEL RETENTION FOR HARVESTING IN RESPONSE TO SPRUCE BEETLE OUTBREAKS

The Chief Forester's (CF) office provided the Omineca Region Guidance for Stand and Landscape-Level Retention for Harvesting in Response to Spruce Beetle Outbreaks (Sept 9, 2017)[2]. The RED expectation letter (February 18, 2021)

[2] Government of British Columbia, 2017, "OMINECA REGION GUIDANCE Stand and Landscape-Level Retention for Harvesting in Response to Spruce Beetle Outbreaks September 09, 2017",

outlined that the continued creation of a spatial component of the Action Plan is essential to show that licensees and BCTS are working on a collaborative landscape plan. The 2021 Action Plan demonstrates a coordinated effort by the OSBMT to plan spruce beetle harvesting with both landscape and stand level retention as a clear objective. The iterative nature of this plan seeks to align the non-legal expectations and guidance while balancing these with the legally established objectives set by MoFLNRORD. The key narrative of the CF's retention guidance is to minimize unintended large, amalgamated openings and focus on the most damaged stands while retaining or avoiding non-infested trees for midterm and other values.

The 2021 Action Plan is a landscape level strategic 'intentions' plan. The OSBMT went through a planning exercise where a decision was made on the best action to take on each stand level incidence of low to very severe spruce beetle attack. Every attribute from Table 10, contained in Appendix 3, was considered during this process, providing valuable contributions to achieving the CF's Guidance. Areas external to Resultant 3 were included as part of the retained and deferred categories to capture the multiple values that must be addressed on the landscape in addition to the spruce beetle infestation. Table 8 below outlines the RED expectations in relation to the CF's retention guidance and how the OSBMT is implementing the direction.

Table 8 - OSBMT implementation of Chief Forester's Stand and Landscape-Level Retention Guidance in response to RED Expectations Letter

Landscape Level Retention	Stand Level Retention
• Collaboration on landscape level planning – partially completed through 2021 Action Plan • Development of a spatialized plan – complete through the 2021 Action Plan	• Increased retention levels based on increased opening sizes - ongoing • Increase use of partial harvest silviculture systems - ongoing • Consideration of Harvest Prioritization Matrix Guidance - ongoing

In regards to landscape level retention, the OSBMT has collaborated to create the 2021 Action Plan spatial component. Work is ongoing regarding collaborative landscape level planning, and collaboration on landscape level planning specific to patch size constraints is best addressed through the LLOWG. The OSBMT also anticipates an increase in collaborative landscape level planning when MoFLNRORD led comprehensive land use initiatives get underway.

Stand level retention is ongoing, each OSBMT member is implementing strategies and incorporating guidance to ensure their respective planning incorporates those values outlined in Table 8.

The CF's guidance for landscape and stand level retention was incorporated into this plan utilizing the following strategies:

- Landscape level corridors/connectivity
- LLOWG biodiversity targets/Patch breaks
- Terrain/Landforms

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https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/forest-health/bark-beetles/retentionguidance_spruce_beetle_20sept2017.pdf

- Riparian buffers
- Wildlife Tree Retention Areas (WTRA)

OSBMT participants are all implementing increased stand level retention as per guidance based on opening size. There was also a request for licensees and BCTS to increase partial harvesting silviculture systems, with focus on attacked trees while retaining healthy trees, and mimicking natural gap disturbance patterns. Members of the OSBMT are engaged with MoFLNRORD on the topic of implementing partial cutting Silviculture systems while also working with the contractor base to support the development of the operational skills required to put these into practice. This work is ongoing.

While the 2021 Action Plan seeks to identify where non-legal retention is being left on the landscape, it is connected to legal retention and both make valuable contributions to achieving the CF's Guidance. As noted above, a proportion of the retained and deferred volume from the 2021 Action plan does not fall within AOS polygons. This is because it would be short-sighted to consider spruce beetle in isolation of the myriad of other values on the land base.

METRICS FOR ANNUAL REPORTING ON SPRUCE BEETLE HARVESTING

Each licensee and BCTS currently submit semi-annual reports to District Staff for their respective spruce beetle harvesting, including spatial data. All blocks with cruise data indicating greater than a trace level spruce beetle cruising codes as reported through the current process, regardless of AOS overlap. Themonitoring system of licensee and BCTS reported harvest provides a timelier summary of spruce beetle focused harvest than waiting for harvest depletion reporting to be submitted to FLRNRORD. However, it requires manually compiling data that is being submitted to MoFLRORD through Electronic Commerce Appraisal System (ECAS). The OSBMT supports FLNRORD in developing a streamlined and more transparent method to improve the ability for MoFLNRORD to monitor performance related to spruce beetle harvesting. The OSBMT is working with Regional Ministry personnel to a develop an improved method for the annual reporting on spruce beetle harvesting in the Prince George and Mackenzie Districts NRD's.

Internal MoFLNRORD analysis of spruce beetle harvesting has accessed ECAS data but uses administrative Supply Block and NRD boundaries to report total harvested volume and the associated damaged volume. These administrative boundaries do not correspond well to the most heavily affected stands within the Omineca Region. OSBMT recommend the area be limited to a defined spatial boundary which would represent the main area of spruce beetle infestation in the Prince George and Mackenzie Natural Resource Districts.

MoFLNRORD staff has developed a spatial boundary encompassing the main portion of the spruce beetle infestation, largely focused on the SE portion of the Mackenzie NRD, and the NE portion of the Prince George NRD and along Highway 97. This spatial boundary is still in draft form and is being refined by Ministry GIS and the Regional Entomologist. Once a final spatial boundary of the spruce beetle outbreak is confirmed, cruise data and spatial can be pulled through MoFLNRORD data sources such as ECAS and Forest Tenure Administration (FTA). These may include:

- Net Hectares Treated,
- Net Volume,
- Stand Severity from Cruise
- Species Composition Label
- Spruce Total Volume (m3) Beetle Impacted Volume (m3)
- AOS Polygon Coverage and Severity
- Provide Shapefile

- Beetle damage codes, including Other damage codes.
- Mountain Pine beetle damage

The reporting metrics would be similar to what is currently provided but come from cruise data. The data in the cruise compilation can then be extracted to show composition and damage summaries (spruce beetle and other damage) for each respective licensee and BCTS based on defined reporting periods. The OSBMT is supportive of moving towards this system and is supporting Ministry personnel in its final development. To keep the monitoring closely linked to current harvest activity, the OSBMT is supportive of continuing to provide a list of active spruce beetle blocks, something not currently available through the existing FLNRORD reporting systems.

In Spring of 2021, Licensees and BCTS provided their respecive hauling and milling stratgies to MFLNRORD. OSBMT will ensure adherence to the most recent guidelines provided by Government.

CHIEF FORESTER'S HARVEST PRIORITIZATION MATRIX IN RESPONSE TO SPRUCE BEETLE OUTBREAKS

The Chief Forester's Harvest Prioritization Matrix in Response to Spruce Beetle Outbreaks (the Matrix) was released publicly in June of 2020 and updated in November of 2020[3]. Along with more general guidance around focusing harvest efforts in dead and damaged stands, the Matrix is a stand level guidance tool to be used with detailed field data to assist in the decision-making process for which stands to harvest. The 2021 Action Plan is strategic in scale and utilizes strategic level datasets across multiple TSAs to approximate a best guess of harvest plans over a 7-year time period.

The methodology used by the OSBMT in the 2021 Action Plan has been to utilize the cumulative AOS data to plan the moderate, severe, and very severe AOS polygons along with a proportion of low severity polygons. The prioritization of stands is further refined through the guidance provided in the Harvest Prioritization Matrix by encouraging ongoing monitoring and incorporating more accurate field data such as actual stand severity and live spruce beetle numbers when it becomes available.

The overarching message of the Matrix guidance is that harvesting should focus on the dead and dying timber. The OSBMT members are doing this by focusing harvesting activities on the most severely impacted operating areas assessed at the operating area/drainage scale. Once blocks are designed in an area based on logical harvest boundaries and AOS severity class data then the Matrix is used to target stands for harvest at finer scale based on beetle presence and dead stand composition.

Using the steps outlined in the Matrix in a prescriptive manner ignores the realities of the 2+ year time frame that goes into planning, developing, and permitting blocks. The Matrix is a tool that assumes harvest plans can be easily revised once blocks are permitted. The Matrix fails to acknowledge that data collected one or two field seasons prior to harvest will not be representative of the stand once a permit is issued. The very real time and financial constraints of undertaking planning and field work to secure harvest authorizations do not fit within the timing assumptions of the Matrix. Further, when developing stands you must weigh the risks of adjacent susceptible stands and whether it

[3] Government of British Columbia, 2020, "Chief Forester Expectations For Prioritization in Response to Spruce Beetle Outbreaks, Nov 2020", https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/forest-health/bark-beetles/sprucebeetle_matrix_nov2020a.pdf

should be included within the block boundary. In addition, investments have gone into developing a block and it is difficult to defer one block if other higher priority blocks are present but not under permit.

The time it takes for a block to be available to harvest means that by the time an impacted stand is actioned, spruce beetles may have moved on to adjacent stands or there are other areas showing higher impacts. Even with incorporation of susceptibility mapping, and ongoing monitoring, it's a constant challenge to be at the right place at the right time. The development of both stands to harvest, and their associated infrastructure, are a significant investment such as the licensees and BCTS cannot pivot easily to other areas.

The matrix recommends that lower priority stands be retained and also recommends applying partial harvesting systems. The OSBMT has discussed partial cutting opportunities to ensure other non-timber values maintain across the land base, in addition to midterm timber supply. Individual licensees and BCTS are at different stages for implementing partial harvesting systems and are working with MoFLNRORD and external agencies to develop their own programs. The stands identified by the OSBMT for harvest in the 2021 Action Plan will continue to be monitored and assessed for prioritization based on the Harvest Prioritization Matrix. For reasons outlined above, the Harvest Priority Matrix does demonstrate challenges due to the timing of harvest and other operational factors.

The methodology for the 2021 Action Plan does not correlate well with the Matrix as the AOS does not contain live spruce beetle information. The Matrix is largely influenced by the classification of the Beetle Management Units (BMU's), and the majority of the BMU's in the outbreak area classified as Pest Reduction focus. The pest reduction focus when compared with a salvage focus influences the matrix by increasing the relative priority of stands with higher components of live spruce beetle present. For example, under Pest Reduction focus, a moderate severity stands with >10% live spruce beetle would be a higher priority than a severely impacted stand with any amount of live spruce beetle present.

Further, the Matrix identifies biotic and abiotic disturbances that will contribute to overall damage in the stand. While the 2021 Action Plan is developed with a focus on spruce beetle, it is expected that other damaging agents may increase the relative harvest priority of a stand prior for harvest.

Based on the stand severity and composition of spruce beetle in individual OSBMT member's respective Operating Areas, differing levels of stand priority will be present. This is evident when looking at Figure 12 which illustrates AOS severity by licensee and BCTS. It's also important to consider relative priority within a larger management unit. Much of the infestation area will never hit the high priority threshold for pest reduction based on spruce beetle damage alone, as many of the stands in the Omineca region are true spruce sub-alpine fir mixes.

As we move towards less of the more severely impacted stands available for harvest, each OSBMT will have to begin addressing lower severity stands as part of their harvest profile as higher priority stands will have been actioned. As the Matrix is relative, the highest priority stands depend on the availability of each category. The OSBMT will continue to work together to ensure that spruce beetle impacts are addressed not in isolation of each other but as a group and implement strategies such as Business to Business agreements to ensure highest priority stands are actioned across the landbase within shelf-life expectations of 7 years.

Although there are challenges within implementing the matrix at various scales, the OSBMT members are continually re-evaluating their respective plans and considering the matrix through through the operational lens outlined above. The OSBMT are interested in engaging further with MFLNRORD on implementation of this tool.

NON-RECOVERABLE LOSSES

The OSBMT strives to limit non-recoverable losses from spruce beetle impacts and maintain a viable midterm fiber supply. The Forsite Omineca IBS Gap Analysis (March 26, 2020) looked at NRL's over a 10-year planning cycle in regards to spruce beetle harvesting. Their analysis included the spatial data from the 2019 Action Plan and found that the 2019 Action Plan was effective at reducing the NRL's across multiple scenarios.

Although the spruce beetle impacts in terms of severity and extent have expanded across the Action Plan area since 2019, the methodology in this 2021 Aciton Plan is consistent with the 2019 action plan process used in Forsite's NRL analysis. The 2021 Action Plan, there fore is expected to be as effective as the 2019 action plan at meeting the intent of limiting NRL's.

The Forsite analysis included targeting a portion of the harvest for a partial cutting treatment, the analysis found there was not a significant reduction in NRL's, the analysis did suggest the higher treatment costs did not provide a significant incentive, however the model could be expanded to look at alternative approaches. However, licensees and BCTS are working towards partial harvesting opportunities and are at different stages of implementation.

REPRESENTATIVE HARVEST IN ALL FOREST TYPES TO SUPPORT AAC

Previous plans have identified areas of steep slope terrain. Expertise required for both timber development and harvesting within these areas has diminished over the past number of years while operations occurred mainly on the gentler terrain of the plateau during the mountain pine beetle infestation. As previously noted, significant efforts have been undertaken over the past five years but rebuilding this sector of the industry takes significant financial investment and time. In the 2020 Action Plan, a MoFLNRORD spatial dataset from the timber supply process was used to assess the proportion of cut occurring within steep slope and cable terrain. This overlay was not repeated in the 2021 Action Plan since the general feeling was this layer is out of date and does not reflect the operational realities of steep slope harvesting systems available today.

Where steep slope and cable harvesting can be safely conducted, this proportion of the THLB is being addressed. There is additional difficulty harvesting spruce beetle stands that require steep slope equipment due to the decreased availability of sound trees for the use of cable tie- backs or for tethering equipment safely. Affected licensees and BCTS continue to work actively with the contractor base to increase the capacity to operate in these areas.

ENVIRONMENTAL STEWARDSHIP INITIATIVE

All members of the OSBMT are participating in the ESI. Some OSBMT participants are impacted by this developing management paradigm more so than others, by virtue of operating area overlap with what is called the ESI study area resulting in disproportionate impacts to each affected licensee or BCTS. Currently there are ongoing negotiations which may have significant timber supply impacts. Sharing of spatial planning polygons for some participants will not be shared at this time due to confidentiality clauses associated with this work. OSBMT is committed to sharing the spatial for the ESI study overlap area at such time as it is appropriate based on timelines and stages achieved through the ESI process.

More information on ESI may be access from https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/consulting-with-first-nations/collaborative-stewardship-bc/environmental-stewardship-initiative

SUMMARY

The 2021 Action Plan has demonstrated that the OSBMT is committed to managing spruce beetle infestations within their respective operating areas. Through the spatial process OSBMT members utilized AOS data and operational constraints to come up with an estimate of harvest chance focused on stands impacted by spruce beetle. The plan strives to incorporate all the legal and non-legal constraints when planning harvesting opportunities and identifies areas to defer or reserve which are intended to be excluded from the harvest efforts for a host of both timber (midterm) and non-timber values.

In summary, the results of the 2021 Action Plan demonstrate that:

- There are 50,392 hectares of Planned Harvest. Only 6% of the full Prince George and Mackenzie accumulated AOS Spruce Beetle coverage has the potential to moved forward to the harvest authorization issuance process.
- There are 49,431 hectares of deferred and 84,418 hectares or retained. Over 70% of the area identified through the action plan has been deferred for midterm or other considerations, or retained. Significant legal and non-legal constraints and operational considerations that lead to deferral and retention.
- The Years to action results show that the OSBMT can address the impacted stands within their respective operating areas within the 7-year stand shelf-life timeframe. No participant has a 'Years to Action' of target stands greater than 7 years.
- The 2021 Action Plan aligns with the non-recoverable losses report commissioned by MoFLNRORD and produced by Forsite Consultants in March 2020.
- The Chief Forester Retention guidance document has been incorporated as one of many considerations within the 2021 Action Plan. Significant area has been retained or deferred for many reasons, all of which contribute to landscape and stand level biodiversity.

The connection between high-level planning and operational realities has and always will be the challenge in effectively communicating this plan. The operational realities further challenge forest planners to implement the plan in its fullest extent and the OSBMT is constantly re-focusing our efforts based on new data, objectives, public and First Nations Interests.

As the number of landscape level MoFLNRORD led initiatives increase, it is important to consider how valuable a forest health specific plan continues to be. Given the myriad of other values on the landbase, it is worthwhile to consider whether a more comprehensive and collaborative land use plan would serve MFLNRORD, First Nations, and the public better.

RECOMMENDATIONS

- **Transition away from forest health specific Action Plans to collaboratively developed comprehensive land use plans and consider instead incorporating forest health within a larger collaborative land use planning exercise with the recognition that some licensees are disproportionately affected by spruce beetle and Business to business opportunities should be considered prior to moving in to green wood.**

The original purpose of the plan was to assess the feasibility of addressing spruce beetle infestation with planned harvest. With the incorporation of more detailed and spatial deferred and retention categories, the plan has transitioned away from a tactical plan, and is trending towards landscape level planning which was not the original intent. Over two thirds of the action plan area is in the deferred or retained categories, which demonstrates that we are spending more effort on interpreting constraints, both stand and landscape level, rather than planning for spruce beetle harvesting. The plan demonstrates that planners are considering a multitude of constraints and considerations while leaving stands for midterm.

- **MoFLNRORD should proceed with monitoring and performance measures as Outlined in this report.**

During the development of this report, the OSBMT provided input on how the current monitoring process is working and we are supporting of moving to a transparent and objective system of gathering spruce beetle harvesting data. The OSBMT considers the infest area boundary put forward by MoFLNRORD as aligned well with the most infested area and support using ECAS data to assess infest levels in stands within this area.

NEXT STEPS

1. OSBMT will continue:
    a. To prioritize harvest plans based on forest health impacted stands within their operating areas.
    b. To share harvest information to monitor performance towards biodiversity targets for mBEC units in Prince George and Landscape units in Mackenzie.
    c. With business-to-business agreements, to prioritize harvest in stands impacted by spruce beetle.
    d. The OSBMT will ensure adherence to the most recent Guidelines for Hauling, Milling and Storing strategies issued by the MoFLNRORD for the 2021 – 22 year.
    e. Continue to utilize the Harvest Prioritization Matrix wherever practicable.
    f. To build upon long-term landscape level retention within spruce beetle impacted areas to mitigate impacts to all non-timber stakeholders.
    g. To work with regional entomologist to understand survey data.
2. Initiate discussion with MoFLNRORD on which Action Plan deliverables are necessary to help reduce the administrative burden of producing the Action Plan while still providing the adequate information to MoFLNRORD.
3. OSBMT would like the opportunity to review and comment on spruce beetle outbreak messaging related to this Action Plan prior to public release. The OSBMT appreciates the open conversation occurring regarding spruce beetle management on the land base and consider there to be value in provided in the licensees and BCTS opportunity to work directly with MoFLNRORD.

APPENDICES

APPENDIX 1 – REGIONAL EXECUTIVE DIRECTOR EXPECTATIONS LETTER

APPENDIX 2 – MAPS

MAP 1 – 2020-2019 COMPARISON

MAP 2 – ACTION PLAN MAP 2021 MK WITH RESTRICTIONS

MAP 3 – ACTION PLAN MAP 2021 MK

MAP 4 – ACTION PLAN MAP 2021 PG WITH RESTRICTIONS

MAP 5 – ACTION PLAN MAP 2021 PG

APPENDIX 3 - CREATING THE ACCUMULATED AOS

Creating the Accumulated AOS

1. Union the provincial aerial overview surveys (AOS) for the years 2014 to 2017. Assign midpoint percents to each year's severity. Sum the midpoints to create a new severity percent (the accumulative severity).

2. For helicopter sketch mapping, erase the current year's provincial AOS for the surveyed area. Union in the helicopter survey and add into the accumulative severity.

3. Erase the ground survey blocks from the accumulated AOS. Copy/paste the ground survey blocks into the accumulated AOS. The ground severity is the new accumulated severity (it is not accumulated).

Midpoints for Severity

.5	Trace
5	Light
20	Moderate
40	Severe
75	Very Severe

Severity Index

Severity Code	Severity Range (Percent Attacked Trees)	
	< 1	Trace
0	1-10	Light
1	11-20	Moderate
2	21-30	Moderate
3	31-40	Severe
4	41-50	Severe
5	51-60	Very Severe
6	61-70	Very Severe
7	71-80	Very Severe
8	81-90	Very Severe
9	91-100	Very Severe

APPENDIX 6 - SUMMARY OF GROSS AOS AND AOS-THLB SPRUCE LEADING STANDS INTERSECT - AREA BY SEVERITY CLASS

Table 9 SUMMARY OF GROSS AOS AND AOS-THLB SPRUCE LEADING STANDS INTERSECT - AREA BY SEVERITY CLASS

District	Severity	Gross AOS	AOS THLB Intersect	AOS THLB Spruce leading VRI definition
DMK	T	97,089	33,525	22,407
DMK	L	101,459	29,592	18,449
DMK	M	53,611	14,626	8,744
DMK	S	15,171	5,043	2,712
DMK	V	4,286	1,397	778
DPG	T	122,752	60,962	31,150
DPG	L	177,648	97,814	61,734
DPG	M	109,578	69,368	44,991
DPG	S	45,939	31,165	19,739
DPG	V	29,519	21,142	12,135
DRV	T	7,786	3,113	2,073

District	Severity	Gross AOS	AOS THLB Intersect	AOS THLB Spruce leading VRI definition
DRV	L	8,804	3,360	2,360
DRV	M	3,879	2,425	1,650
DRV	S	1,484	1,071	870
DRV	V	239	170	148
DSN	T	75,204	33,356	23,390
DSN	L	45,241	23,928	18,544
DSN	M	4,891	3,058	2,208
DSN	S	106	79	12
DSN	V	0	0	0
Total	**-**	**904,686**	**435,194**	**274,094**

APPENDIX 4 – CLASSIFICATIONS USED IN THE ACTION PLAN

Table 10 Classifications Used In this Plan

Attribute.Field	Field.Descriptor	ArcGIS.Field.Code	IBS.Action.Plan.Definition
IBS Action Plan Code	Planned Harvest	PH	Planned harvest within next 7 years
IBS Action Plan Code	Retention	R	Retained on landscape
IBS Action Plan Code	Deferred	D	Not included in harvest plan
IBS Action Plan Code	Harvested	CC	Polygons identified where AOS is overlapping areas of historical harvesting Ð these have been removed from the 2020 IBS Action Plan analysis
Legal	Fisheries Sensitive Watershed	1	Constrained due to FSW objectives
Legal	Ungulate Winter Range	2	Constrained due to UWR GWMs/Section 7 notices
Legal	Landscape Biodiversity Orders	3	Constrained due to Landscape Biodiversity Order Objectives
Legal	Draft OGMAs	4	Constrained due to Draft OGMA
Legal	Visuals	5	Constrained due to VQOs

Attribute.Field	Field.Descriptor	ArcGIS.Field.Code	IBS.Action.Plan.Definition
Legal	Wildlife Tree Retention	7	Allocated as legal WTR through site plan/silviculture prescription
Pending Legal	FSW, UWR, LBO, draft OGMAs, VQO, WTR	1,2,3,4,5,6,7	Same as Legal
Non-statutory	Chief Foresters Guidance	1	Retention associated with Chief Forester's Guidance but not legally designated through a site plan
Non-statutory	Moratorium	2	Caribou moratorium area in Mackenzie
Non-statutory	Stakeholder	3	Stakeholder commitment
Harvest Period	Harvest Period 0	0	Harvesting conducted under the 2020 Action Plan (complete or started)
Harvest Period	Harvest Period 1	1	Planned Harvest before April 2023
Harvest Period	Harvest Period 2	2	Planned Harvest between May 2023 and April 2027
Harvest Year	Year		IBS Action Plan Year the block is associated with harvest end date/harvest complete year
Inoperable			Long term physical operability constraints.
Isolated			Patches or slivers less than 5 ha and greater than 750m from a road
Problem Forest Type			Inventory issue i.e. low volume, undesirable species like black spruce or birch, wetlands labelled as spruce types
First Nations Interests			Accommodated Areas -1, Cultural Heritage Areas - 2
Environmental Stewardship Initiative		1,2,3	Riparian - 1, Moose -2, Biodiversity Management Areas (BMA) - 3
Mid Term			Non spruce leading, spruce leading - no attack, low or moderate severity but Bl content is high
Access			significant infrastructure required to reach, Lake tow constraints
Volume Declined			TSLs that have had no successful bids or B2B volume declined
Business to Business Agreement (B2B)*	Confirmed volume shared through signed B2B agreement	1	
Business to Business Agreement (B2B)*	Potential volume available for B2B discussion	2	

Attribute.Field	Field.Descriptor	ArcGIS.Field.Code	IBS.Action.Plan.Definition
Partition			Constrained due to Mackenzie partition requirement
Shelf Life			Wood quality issues
Comments			Any relevant comments specific to individual polygons.

APPENDIX 5 – EXCEL TABLES AND DATA EXPORT

Numeric Tables and an export of the analsysis data have been provided in an Excel file.