

# Omineca Spruce Beetle 2020 Action Plan Report

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## OSBMT Response to September 3, 2019 Expectations Letter

### Response to Regional Executive Director – MoFLNRORD

**To:** Greg Rawling, Regional Executive Director – MoFLNRORD,

Regarding your September 3, 2019 request for a response by Forest Licensees and BCTS to the Omineca spruce beetle (IBS) 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 IBS on timber supply, specifically within the Prince George and Mackenzie Natural Resource Districts (NRD).

This 2020 IBS Action Plan continues to incorporate best available science and information obtained through the continued collaboration of the MoFLNRORD staff, experts, and contractors. This process has been integral to the implementation of four previous iterations of the 2020 IBS 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 2019 AOS data shows an increase in infestation area of roughly 100,000 ha from the area reported in the 2018 AOS data.
- The focus is prioritizing and planning harvesting activities to reduce beetle populations, minimizing 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 2020 – 21 year.
- Table 8 summarizes the 2020 IBS Action Plan Results in relation to projected Licensee AAC illustrating that the OSBMT is able to address spruce beetle within their affected operating areas and that business to business arrangements are the most appropriate tool to manage AOS area outside of the 7 year shelf life time frame. An condensed version of Table 8 is displayed below :

Licensee	District	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	AAC as Area (ha) @ 305m3/ha	Approx. number of years to action		B2B Planned Harvest (ha) (Included in PH area)
					Planned Harvest - All	Planned Harvest - Target AOS	
BCTS	DMK	29,292	19,290	2,951	4.2	2.4	96
Canfor	DMK	14,682	4,768	1,375	0.3	0.1	61
Conifex*	DMK	7,053	3,924	1,148	0.9	0.9	234
<b>Subtotal</b>		<b>51,028</b>	<b>27,981</b>	<b>5,473</b>			<b>391</b>
BCTS	DPG	40,807	23,756	2,951	6.0	4.7	0
Canfor	DPG	39,279	22,009	2,619	3.2	2.6	0
Carrier	DPG	2,857	627	213	4.1	3.2	0
Sinclar Group	DPG	52,010	41,367	2,459	8.3	6.8	2,572
<b>Subtotal</b>		<b>134,953</b>	<b>87,759</b>	<b>8,242</b>			<b>2,572</b>
<b>Total</b>		<b>185,981</b>	<b>115,741</b>	<b>13,715</b>			<b>2,963</b>

\* includes Conifex's proportion of AAC for 1040806 BC Ltd, as per Licensee AAC Capacity Table, as this cut is allocated within Conifex's operating area within the Mackenzie NRD.

## Current 2019 Aerial Overview Survey (AOS) Beetle projection

In April 2020, Dr. Jeanne Robert has provided the most current projections of the 2019 AOS data. The current projection of the 2019 outbreak shows an increase in impacted area in contrast to the reduced area reported in 2018. This data references the entire area of AOS coverage, which is greater than the Crown Forest Land Base (CFLB):

### Spruce Beetle - Omineca

- **2014** – Infestation detection.
- **2015** – Outbreak declared Mackenzie and Prince George Timber Supply Areas.
- **2016** – Growth continues in Omineca Region.
- **2017** – Continues to expand.
- **2018** – Reduced attack area.
- **2019** – 353,870 hectares

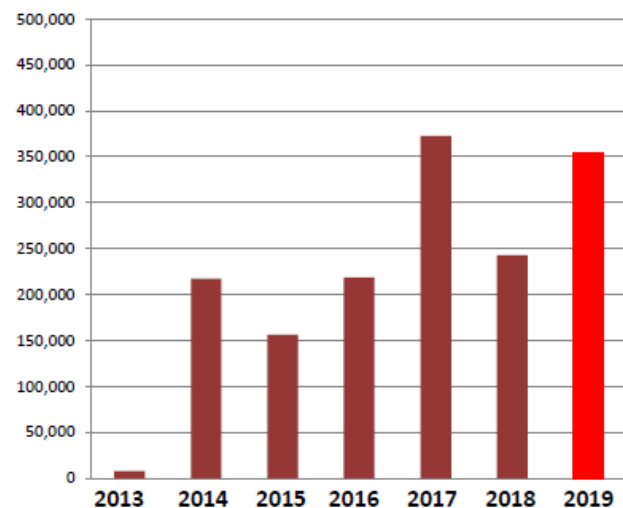


Figure 1 2014 - 2019 AOS Data



Currently the infestation area within the Omineca Region represents the majority of spruce beetle activity on a provincial scale.

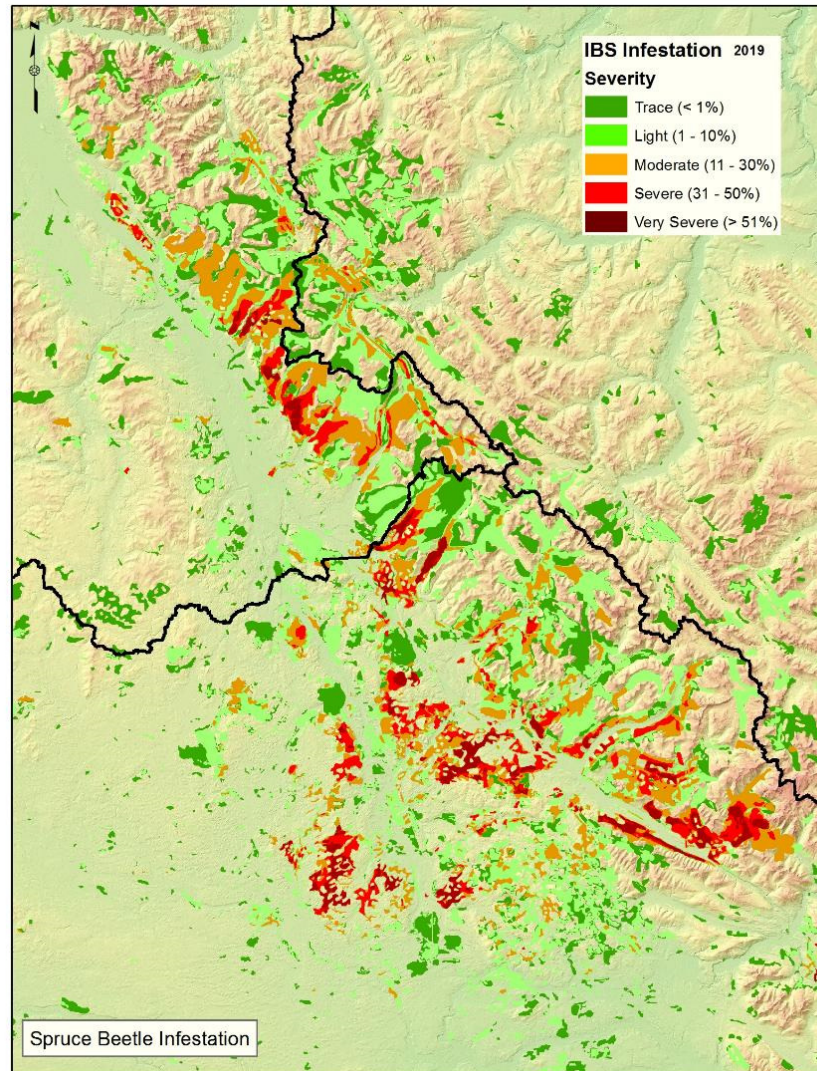


Figure 2 Omineca Region 2019 accumulated AOS coverage



## Data Inputs and Methods

### Netdown Process – Determining the Area Under the Plan

The 2020 IBS Action Plan is based on the IBS infestation data from the 2019 accumulative AOS. As this survey data is coarse and covers a landbase greater than the provincial forest, is based on CFLB and incorporates all lands, the OSBMT analysis has taken the most recent Timber Harvesting Land Base (THLB) definitions for each Timber Supply Area (TSA) and applied it to the AOS data to more accurately reflect operational reality.

After discussion with government representatives regarding relevant AOS stands occupying THLB, 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. Table 1 outlines changes to the definition of applicable stands between the two most recent iterations of the plans:

*Table 1 Comparison of initial AOS VRI netdown query- 2019 vs 2020 IBS Action Plans*

Action Plan Iteration	2019	2020
Species Definition (VRI Attribute Data)	Species Cd 1 contains Sx	Species Cd 1 contains Sx; Species Cd 2 contains Sx and Species % 2 >= 35%
Age Class (VRI Attribute Data)	Age Class 6+	No Age Class Restriction

This update to the definition of applicable stands results in a significant increase to the landbase being considered under the 2020 IBS Action Plan. Table 2 demonstrates the magnitude of this change between the 2019 and 2020 iterations of the IBS Action Plan.

*Table 2 Comparison of Area under the Plan - 2019 to 2020*

TSA	2019 Action Plan CFLB Leading Spruce (AC 6+) (ha)	2020 Action Plan CFLB Leading Spruce and Spruce Secondary (all AC) (ha)	Landbase Difference (ha) - 2019 and 2020 Action Plans (ha)
Mackenzie	69,755	98,540	28,785
Prince George	210,187	264,399	54,212
Robson Valley	5,845	11,257	5,411
	285,787	374,195	88,408

Removing the Age Class restriction that had previously been in place within previous IBS Action Plans demonstrates the coarse filter applied by using the AOS coverage. The purpose of the

AOS data is for large scale capture of forest health trends at a provincial level. A simple age class analysis reveals how using data gathered for non-operational purposes introduces uncertainty into the resulting analysis. The age class distribution of the Omineca Region AOS intersected with the THLB coverage is shown in Figure 3.

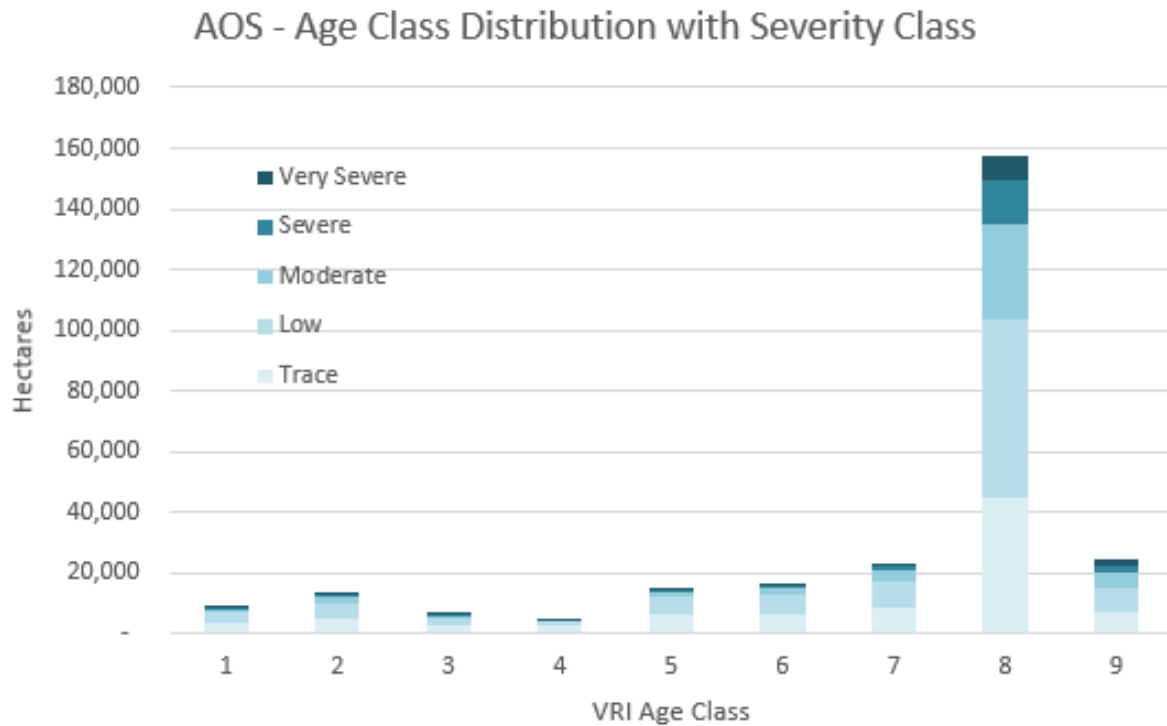


Figure 3 AOS age class distribution including severity class

Discussion of this age class distribution with Dr. Jeanne Robert has resulted in the removal of all Age Class 1 and 2 polygons from the AOS data. The plan focuses on actioning age classes 6 to 9 for harvesting within the next seven years and designating age classes 3 to 5 for midterm timber supply. There is some discrepancy in the data when dealing with the younger stands. Both Age Class 3 and 4 contain considerable overlap with the provincial consolidated cutblock layer. Some of this overlap is visible on imagery as intermediate utilization logging and offers a feasible midterm timber supply opportunity. Other overlap polygons are visible clearcuts and do not appear from imagery to contain mature timber. In order to action these polygons effectively they would have to be individually assessed by the Forest Licensee. Given the time frame of this plan, this was not completed, and it should be noted that this is an additional source of error in the overall data inputs.

After applying the THLB and species netdowns to the AOS area, and then removing the Age Class 1 and 2 polygons, further area net downs were applied to the data to more accurately

represent the area addressed in the 2020 IBS Action Plan. These have been listed below in Table 3.

*Table 3 Omineca spruce bark beetle area net downs to AOS data in stands  $\geq 35\%$  spruce stands from THLB*

<b>Area Net Downs to AOS Data in Stands <math>\geq 35\%</math> Spruce from THLB</b>
Parks, Protected Areas (anything excluded from THLB)
Provincial consolidated cut block layer – Forest Analysis Inventory Branch layer
Results Reserves (Code G, Object <>TIM)
Ungulate Winter Range (No Harvest polygons removed, conditional harvest polygons remain in dataset)
Wildlife Habitat Areas
Visual Quality (Retention and Preservation VQO removed, all other VQO remain in dataset)
Old Growth Management Areas (Legal and Non-Legal) <ul style="list-style-type: none"> <li>- Including proposed A25 Landscape Biodiversity Area, Approved TFL30 and Holmes Draft OMGAs</li> </ul>
Less than 1 ha isolated polygons
Licensee reported harvested areas
Recent wildfires

Table 4 summarizes the areas, by spruce leading stands and secondary spruce stands ( $>35\%$ ), at risk within the Omineca Region. Natural Resource Districts were used as analysis units and estimates of area impacted have been generated using the most current VRI available for each geographic location.

Table 4 Summary of spruce leading and secondary spruce stands ( $\geq 35\%$ ) at risk within the Omineca Region

**Spruce Leading and Secondary Spruce Stands ( $>35\%$ )**

Natural Resource District	AOS*	CFLB Leading Spruce	CFLB Secondary Spruce	THLB Leading Spruce	THLB Secondary Spruce	Addressed by Plan**
Mackenzie	251,988	78,957	19,583	44,513	8,345	66,663
Prince George	449,651	228,133	36,266	127,141	15,271	187,372
Robson Valley	21,276	9,585	1,671	5,881	695	0
Stuart Nechako	110,758	49,171	7,918	34,969	5,106	28,281
	833,672	365,847	65,437	212,505	29,417	282,317

\* Accumulated AOS minus consolidated cut blocks and licensee reported harvesting

\*\* All action codes

Due to the small extent of the infestation in the Robson Valley TSA and Stuart Nechako NRD, previous iterations of the Action Plan have focused exclusively on Mackenzie NRD and the Prince George NRD portion of the Prince George TSA. This continues to apply for the 2020 IBS Action Plan.

The Forest Licensees have provided their Annual Allowable Cut (AAC) capacity to address IBS infestation within Prince George and Mackenzie NRDs (Table 6). Given that all the other data inputs are measures of area, it is necessary to convert AAC into representative area in hectares. To do this, a conversion factor of  $305\text{m}^3/\text{ha}$  has been used.

A review of the cumulative District level spruce beetle harvest reporting shows that the average volume per hectare for the entire Omineca Region since 2016 through to 2019 is at  $295\text{ m}^3/\text{ha}$ . This average volume includes early reporting from 2016 that reflects the harvest plans shift towards more spruce beetle focused stands. The average volume per hectare in the Prince George NRD alone from winter 2016-17 through to the latest round of reporting yields  $310\text{ m}^3/\text{ha}$ . The OSBMT is satisfied that using  $305\text{ m}^3/\text{ha}$  to represent an average volume per hectare is in line with current stand volumes and remains an appropriate assumption.

## Transparency and Assumptions

As in previous years, the OSBMT continues to work with the MoFLNRORD GIS analyst to provide the best available data for decision making. The analysis for the 2020 IBS Action Plan uses assumptions and net downs as agreed to by the OSBMT and MoFLNRORD staff. Additional analysis of the data was completed to address information related to the Landscape Biodiversity Orders and the effect of harvest on licensee legal obligations. To complete this analysis, Licensee Landscape Objectives Working Group datasets for both the Prince George TSA and the Mackenzie TSA were utilized. The associated Prince George and Mackenzie Licensee Landscape Objectives Working Group (LLOWG) tables provide this data (Appendices C and D).

As identified in the September 3, 2019 Expectations Letter from the Omineca Region Regional Executive Director, previous iterations of the IBS Action Plan have operated on the assumption that all the Forest Licensee AAC is being directed at spruce beetle management. In response to the request for a projection of what proportion of individual licensee AAC is being directed towards the infestation, on February 7, 2020 the Forest Licensees 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 AAC to direct towards spruce beetle has been incorporated into the 2020 IBS Action Plan.

The OSBMT has recommended in the past that more analysis be conducted, assessing how timber supply and economic losses are being affected due to the Omineca spruce beetle outbreak. This work was completed by MoFLNRORD in 2020, through a contract with Forsite Consultants Ltd. Forsite actively sought engagement from the Omineca Region Forest Licensees, including members of the OSBMT, to provide input into the model created. As noted in the September 3, 2019 RED Expectation Letter, the provision of realistic projected harvest rates by Forest Licensees was considered to be a key component of this project and the OSBMT was able to provide this information based on the interim update to Table 2 of the 2019 IBS Action Plan. The non-recoverable losses work was not completed in time for the OSBMT to use the finding in the 2020 IBS Action Plan, but the results it generated will be considered in the 2021 IBS Action Plan.

Shelf life continues to be a question for consideration in the 2020 IBS Action Plan. 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 IBS infestation patterns. IBS 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 2020 IBS Action Plan year should be addressed by 2027 by the affected licensee. It should be noted that research into 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.

This report, along with the analysis and data used to produce the 2020 IBS Action Plan, has been provided to government for use in communicating industry response to the spruce beetle outbreak to the general public. The OSMBT will continue to support MoFLNRORD in their communication efforts.

## Analysis

The spatialized 2020 IBS Action Plan polygons (Planned Harvest (PH), Deferred (D), Retention (R), and Previously Addressed (CC)) were run through a GIS process whereby they were intersected with several other descriptive GIS layers. These included the spatial 2019 LLOWG results for the Prince George, Stuart Nechako and Mackenzie natural resource districts, most recent VRI for respective regions, most recent Environmental Stewardship Initiative Biodiversity Management Areas (BMAs), and various other categorical layers such as district and landscape unit. Once a resultant feature class was completed its data table was exported to comma separated value format and imported as a data frame into an R programming environment (using Rstudio).

Four appendices were produced:

- Appendix A which summarises Prince George and Stuart Nechako AOS by LUMPNDU and licensee.
- Appendix B which summarizes Mackenzie AOS by LU Group.
- Appendix C summarises Prince George and Stuart Nechako AOS in Old, Old Interior and Mature categories, then quantifies the impact on LLOWG 2019 surplus/deficit for Old and Old Interior for four scenarios:
  - Scenario A: Licensee spatialized action plan where AOS has been categorized into planned harvests (PH), deferred (D) and reserved (R). The impact on the 2019 LLOWG surplus deficit includes only Licensee AOS categorized as PH.
  - Scenario B: This is the impact on the 2019 LLOWG surplus/deficit from Licensee PH as well as D.
  - Scenario C: This is a scenario quantifying the impact on Old and Old interior of AOS in severity classes VS, S, M, and half of the Low.
  - Scenario D: This is a scenario quantifying the impact on Old and Old Interior of AOS in all severity classes.
- Appendix D repeats Appendix C scenario impacts for Mackenzie and is based on LU Groups.

## Spatial Retention Plan

Since the request in the 2018 Expectations Letter, the OSBMT has been refining the process to delineate spatial retention within the outbreak area. The 2020 IBS Action Plan has further refined the attribute data associated with the classifications within the 2019 IBS Action Plan to more fully demonstrate the constraints on the landbase, many of which cannot be applied as

spatial netdowns at the landscape level. Examples of planning constraints that cannot be applied as spatial netdowns at the landscape level include, but are not limited to, the management of:

- equivalent clearcut area (ECA) thresholds,
- visual quality objectives in viewsheds with partial retention and modification visual quality objectives
- General Wildlife Measures in conditional harvest Ungulate Winter Range Polygons
- Wildlife features (bear dens, nest locations, breeding habitat)

The data used to produce the maps that accompany the 2020 IBS Action Plan contain the designations shown in Table 5.

Table 5 2020 IBS Action Plan Attribute Data Dictionary

Attribute Field	Field Descriptor	ArcGIS Field Code	IBS Action Plan Definition
IBS Action Plan Code	Planned Harvest	PH	Planned harvest within next 7 years
	Retention	R	Retained on landscape
	Deferred	D	Not included in harvest plan
	Harvested	CC	Polygons identified where AOS is overlapping areas of historical harvesting – these have been removed from the 2020 IBS Action Plan analysis
Legal**	Fisheries Sensitive Watershed	1	Constrained due to FSW objectives
	Ungulate Winter Range	2	Constrained due to UWR GWMs/Section 7 notices
	Landscape Biodiversity Orders	3	Constrained due to Landscape Biodiversity Order Objectives
	Draft OGMA's	4	Constrained due to Draft OGMA
	Visuals	5	Constrained due to VQOs
	Pending Legal	6	Constrained due to immediately pending legal order
	Wildlife Tree Retention	7	Allocated as legal WTR through site plan/silviculture prescription
Non-statutory**	Chief Foresters Guidance	1	Retention associated with Chief Forester's Guidance but not legally designated through a site plan
	Moratorium	2	Caribou moratorium area in Mackenzie
	Stakeholder	3	Stakeholder commitment
Harvest Period	Harvest Period 1	1	harvest before April 2023
	Harvest Period 2 –	2	harvest between May 2023 and April 2027
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 ie. low volume, undesirable species like black spruce or birch, wetlands labelled as



			spruce types
First Nations Interests*			Accommodated areas, Cultural Heritage areas, ESI
Mid Term*			Non spruce leading, spruce leading - no attack, low or moderate severity but BI 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	
	Potential volume available for B2B discussion	2	
Partition*			Constrained due to Mackenzie partition requirement
Shelf Life*			Wood quality issues
Comments			Any relevant comments specific to individual polygons.

\*Binary attribute data fields, 1 is used to indicate if the constraint applies on a polygon

\*\*When more than one legal or non-statutory constraint exists, constraints are separated in attribute data with a dash

Specific to the Retention designation, 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. All areas designated as Retention are non-legal and subject to change at the Forest Licensees' discretion, as better information becomes available. The areas presented in the 2020 IBS 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.

## Results

### 2020 IBS Action Plan Outputs

Building upon the 2019 IBS Action Plan, the OSBMT has updated the spatial retention and harvest plan component of the 2020 IBS Action Plan as requested in the September 3, 2019 Expectations Letter to reflect changes to the spatial plan brought about by the curtailment and indefinite closures that occurred throughout the latter half of 2019.

Table 6 Conversion of Licensee AAC Capacity (m<sup>3</sup>) to Area (ha)

Licensee AAC Capacity (m3) Converted to Area (ha)					
Licensee	District / TSA	Licence	AAC (m3)	Projected AAC directed to Sx Beetle (m3 per Year) - as of April 2020	AAC as Area (ha) @ 305m <sup>3</sup> /ha
BCTS	Mackenzie NRD	Mackenzie	900,000	900,000	2,951
Canfor	Mackenzie NRD	A15384	1,082,904	419,289	1,375
Conifex	Mackenzie NRD	A15385	632,500	250,000	820
1040806 BC Ltd.	Mackenzie NRD	A93631	300,000	100,000	328
<b>Subtotal</b>	<b>Mackenzie TSA</b>		<b>2,915,404</b>	<b>1,669,289</b>	<b>5,473</b>
BCTS	PG NRD	PG	900,000	900,000	2,951
Carrier	PG TSA	PG	253,027	65,000	213
Canfor	PG NRD	PG	1,597,771	798,886	2,619
Sinclar	PG TSA	PG	1,021,628	750,000	2,459
<b>Subtotal</b>	<b>PG District</b>		<b>3,772,426</b>	<b>2,513,886</b>	<b>8,242</b>
<b>Total</b>	<b>Omineca</b>		<b>6,687,830</b>	<b>4,183,175</b>	<b>13,715</b>

Appendices A & B illustrate the impacts of THLB AOS to licensee chart areas within the 2020 IBS Action Plan area, by mBEC and LU, respectively. This data was then summarized to provide an accounting of how the spatial harvesting and retention components of the 2020 IBS Action Plan demonstrate the approximate planning horizons of AOS identified area.

The netdowns that were used in the 2020 IBS Action Plan to generate the Target AOS-THLB intersect are shown in Table 7. Table 7 steps through the netdowns required to generate what was considered to be the Target AOS-THLB intersect that was used as the initial spatial dataset provided to the OSBMT to create the subsequent spatial components of the 2020 IBS Action Plan.

Table 7 AOS Area Net Downs Applied to Produce Target AOS-THLB Intersect

Licensee	District / TSA	AOS - All Area - 2019 Accumulative	AOS - Remaining THLB (all severity and age classes, netted down, Sx leading and Sx secondary >35%)	Remaining AOS THLB (Sx leading, Sx Secondary) Removed Immature - AC 1 & 2, all severity classes	Target AOS THLB (Sx leading, Sx secondary >35% Age class 3-9, Trace Removed)	Subset Target AOS - THLB (L-VS, AC 3-5, Sx Leading and Sx Secondary >35%)	Subset Target AOS - THLB (L-VS, AC6+, Sx Leading and Sx Secondary >35%)	AOS THLB Non Spruce Leading (No netdowns, All severity classes and all age classes, Spruce <35%)	Licensees Reported Harvesting 2016 - present
BCTS	DMK	151,404	29,292	27,292	20,456	1,166	19,290	31,619	4,953
Canfor	DMK	40,931	14,682	13,570	5,146	378	4,768	14,160	10,107
Conifex	DMK	49,983	7,053	6,765	3,926	2	3,924	11,447	7,431
<b>Subtotal</b>		<b>242,318</b>	<b>51,028</b>	<b>47,628</b>	<b>29,528</b>	<b>1,546</b>	<b>27,981</b>	<b>57,226</b>	<b>22,491</b>
BCTS	DPG	125,421	40,807	38,271	27,634	3,878	23,756	34,597	6,106
Canfor	DPG	191,235	39,279	35,925	23,777	1,768	22,009	45,498	41,159
Carrier	DPG	9,893	2,857	2,668	647	19	627	3,326	3,139
Sinclar Group	DPG	127,976	52,010	47,572	44,149	2,782	41,367	59,358	6,714
<b>Subtotal</b>		<b>454,525</b>	<b>134,953</b>	<b>124,436</b>	<b>96,206</b>	<b>8,447</b>	<b>87,759</b>	<b>142,780</b>	<b>57,118</b>
<b>Total</b>		<b>696,843</b>	<b>185,981</b>	<b>172,064</b>	<b>125,734</b>	<b>9,993</b>	<b>115,741</b>	<b>200,006</b>	<b>79,608</b>

The planning horizon table shown below links the projected licensee AAC capacity of Table 6 and the Target AOS THLB from Table 7 to the 2020 IBS Action Plan spatial components and

indicates an approximate time frame for each OSBMT licensee to address the AOS polygons in their respective operating areas. Given that the area encompassed in the 2020 IBS Action Plan is greater than that of the AOS coverage, Table 8 also demonstrates the proportion of both AOS and non-AOS area included in the 2020 IBS Action Plan.

Table 8 Planning Horizon - 2020 IBS Action Plan

Licensee	District	AOS - Remaining THLB (all severity and age classes, netted down, Sx leading and Sx secondary >35%)	Subsuet Target AOS - THLB, L-VS, AC6+, Sx Leading and Secondary	Action Plan - Deferred			Action Plan - Retention			Action Plan - Planned Harvest			AAC as Area (ha) @ 305m3/ha	Approx. number of years to action		B2B Planned Harvest (ha) (Included in PH area)
				AOS (All Severity, All Age Classes)	Target AOS (THLB, L-VS, AC6+, Sx Leading and Secondary)	Non AOS (All Age Classes)	AOS (All Severity, All Age Classes)	Target AOS (THLB, L-VS, AC6+, Sx Leading and Secondary)	Non AOS (All Age Classes)	AOS (All Severity, All Age Classes)	Target AOS (THLB, L-VS, AC6+, Sx Leading and Secondary)	Non AOS (All Age Classes)		Planned Harvest - All	Planned Harvest - Target AOS	
BCTS	DMK	29,292	19,290	11,536	7,105	13,300	9,178	5,781	384	9,955	6,951	2,506	2,951	4.2	2.4	96
Canfor	DMK	14,682	4,768	2,828	2,237	3,170	2,009	1,413	1,103	127	86	320	1,375	0.3	0.1	61
Conifex*	DMK	7,053	3,924	1,035	1,018	3	1,955	1,890	11	1,065	1,027	0	1,148	0.9	0.9	234
<b>Subtotal</b>		<b>51,028</b>	<b>27,981</b>	<b>15,399</b>	<b>10,361</b>	<b>16,473</b>	<b>13,142</b>	<b>9,084</b>	<b>1,498</b>	<b>11,148</b>	<b>8,063</b>	<b>2,826</b>	<b>5,473</b>			<b>391</b>
BCTS	DPG	40,807	23,756	21,242	7,463	2,564	8,708	6,517	9	15,397	13,856	2,424	2,951	6.0	4.7	0
Canfor	DPG	39,279	22,009	17,359	14,223	2,526	17,302	14,565	2,192	7,676	6,790	817	2,619	3.2	2.6	0
Carrier	DPG	2,857	627	643	592	0	106	101	6	738	674	143	213	4.1	3.2	0
Sinclar Group	DPG	52,010	41,367	14,697	13,737	298	14,148	13,117	5,819	17,822	16,721	2,663	2,459	8.3	6.8	2,572
<b>Subtotal</b>		<b>134,953</b>	<b>87,759</b>	<b>53,941</b>	<b>36,016</b>	<b>5,388</b>	<b>40,264</b>	<b>34,300</b>	<b>8,026</b>	<b>41,633</b>	<b>38,041</b>	<b>6,047</b>	<b>8,242</b>			<b>2,572</b>
<b>Total</b>		<b>185,981</b>	<b>115,741</b>	<b>69,340</b>	<b>46,377</b>	<b>21,861</b>	<b>53,406</b>	<b>43,384</b>	<b>9,525</b>	<b>52,781</b>	<b>46,104</b>	<b>8,873</b>	<b>13,715</b>			<b>2,963</b>

\* includes Conifex's proportion of AAC for 1040806 BC Ltd, as per Licensee AAC Capacity

Table, as this cut is allocated within Conifex's operating area within the Mackenzie NRD.

A summary of the amount AOS by severity class and age class remaining outside of the 2020 IBS Action Plan is provided below in Figure 4.

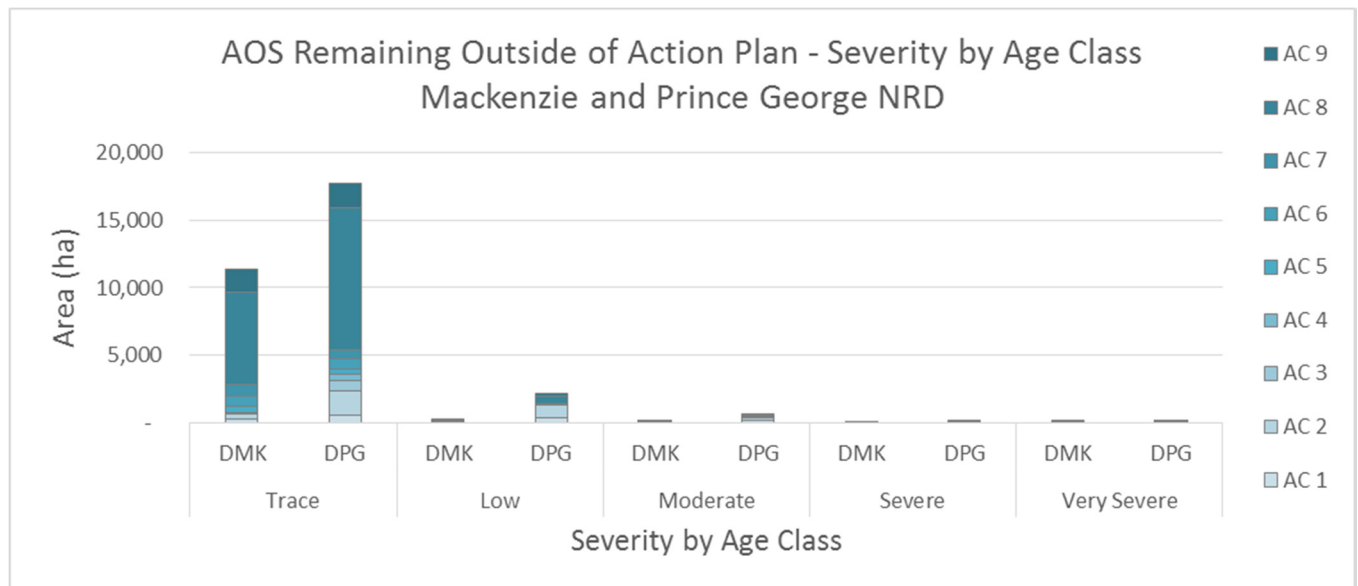


Figure 4 AOS Remaining Outside of 2020 IBS Action Plan

The OSBMT continues to work with MoFLNRORD GIS staff to provide transparency to operations to address landscape level retention. The maps produced from this exercise show a consolidated seven-year planning horizon along with deferred areas and landscape retention areas.

### Landscape Biodiversity Orders

Analysis of the impacts to the Landscape Biodiversity Orders was completed on the initial iteration of the 2020 IBS Action Plan spatial components submitted May 2020. In June 2020, revisions to the spatial components were completed to rectify inconsistent inclusion of AOS severity classes between OSBMT members associated with the May 2020 version.

Due to time constraints, the updated June 2020 shapefile was not re-evaluated against the Landscape Biodiversity Orders. Given that the revised June 2020 spatial components result in a decrease in area included in the 2020 IBS Action Plan, the results presented above and discussed below demonstrate a larger impact than would be present in the June 2020 shapefile and are still valid for the purposes of the 2020 IBS Action Plan.

For both the Mackenzie and Prince George TSAs, landscape level retention is a requirement both through Forest and Range Practices Act (FRPA) and the more defined Landscape Biodiversity Orders (LBOs). The LBOs for both TSAs set Old Forest Targets, which are applied to grouped Landscape Units and merged BEC units (mBEC) for Mackenzie and Prince George respectively. Although different in unit measurement, both orders are similar in scope and seek to achieve the same result; retention of enough old growth stands to maintain ecosystem integrity and function for all non-timber related objectives.

Similar to the 2019 IBS Action Plan, the updated spatial data provided in the 2020 IBS Action Plan is used to demonstrate the potential impacts of landscape level planning and IBS management to Forest Licensees' ability to meet legal requirements of the LBOs. This analysis is contained in Appendix C – Prince George LLOWG table and Appendix D - Mackenzie LLOWG table.

The associated Prince George and Mackenzie LLOWG tables show all pertinent data collected through the LLOWG process for available Old Growth and the impacts to the Merged BEC units and identified LU, respectively. The columns in the tables show the impact of harvest to all affected units based on 4 scenarios:

- a. Scenario A: Spatial 2020 IBS Action Plan – 7-year harvest scenario.
- b. Scenario B: Planned Harvest from 202 IBS Action Plan spatial plus harvest of deferred (excluding isolated and inoperable polygons)
- c. Scenario C: Harvest of all AOS identified polygons, 50% of Low, all Moderate to Very Severe.
- d. Scenario D: Harvest of all AOS polygons Trace to Very Severe

The following figures show the impacts to the Prince George and Mackenzie LBO targets. Both Old Forest and Old Interior Targets have been presented for the mBECs present within the Prince George NRD portion of the Prince George TSA. For the Mackenzie TSA LBO, only the grouped Landscape Units that contain targets have been presented. As there are not targets related to Old Interior Forest in the Mackenzie LBO, these results have not been presented.

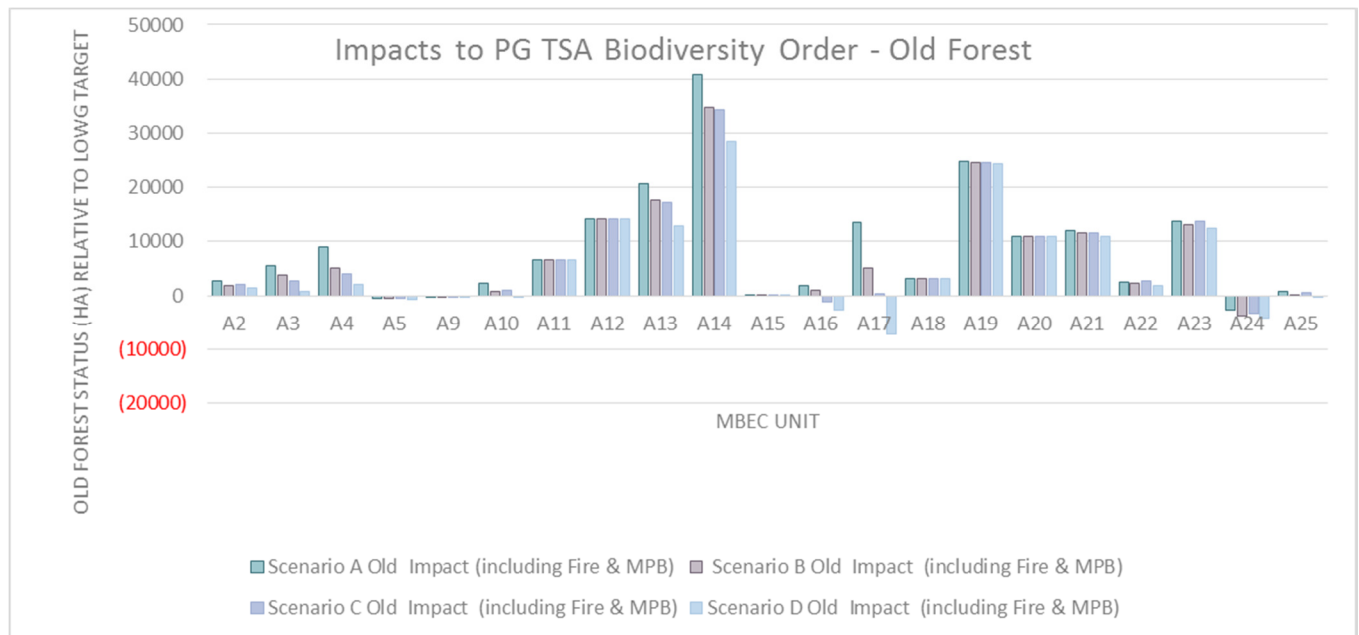


Figure 5 Impacts to Prince George TSA Biodiversity Order - Old Forest

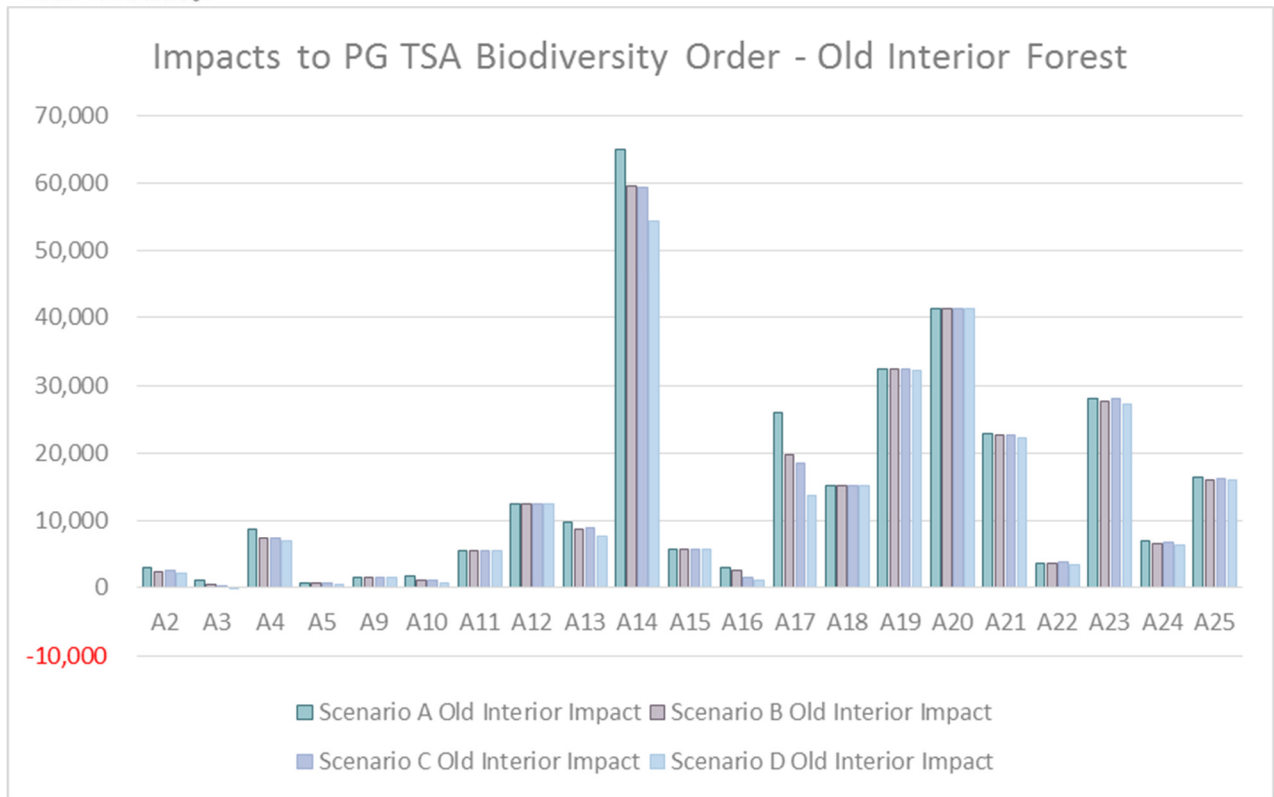


Figure 6 Impacts to Prince George TSA Biodiversity Order - Old Interior Forest

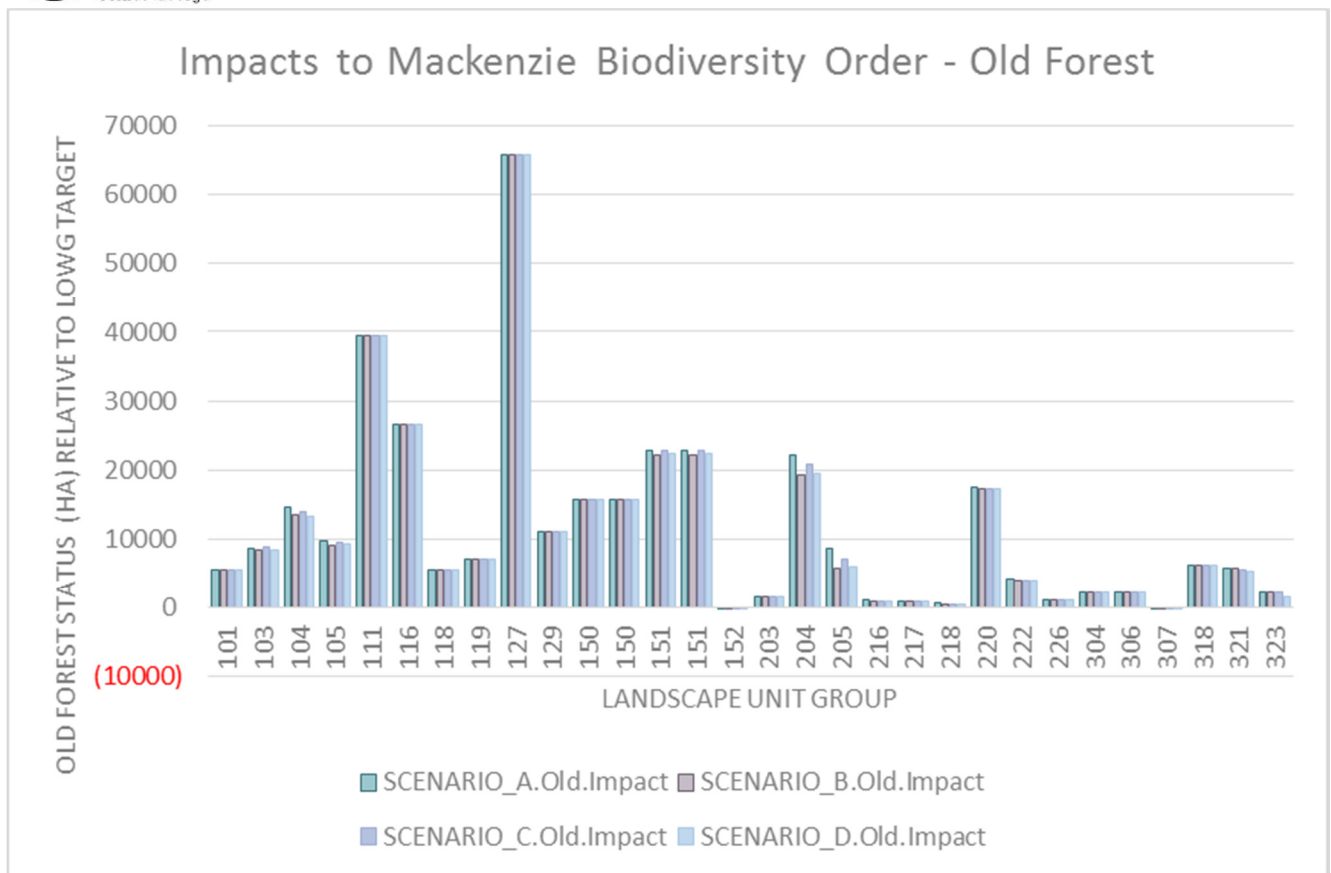


Figure 7 Impacts to Mackenzie TSA Biodiversity Order - Old Forest

### Representative Harvest in all Forest Types to Support AAC – Omineca Region

Table 10 shows planned and deferred harvest by licensee, by operability for the entire Omineca Region, while Table 11 shows previous harvest by licensee, by operability for the previous four years of harvest based on the annual district beetle harvest reporting. The operability layer is an internal MoFLNRORD operability coverage.

Table 9-10 Licensee Planned Harvest and Deferred Area (ha) by Operability Class

	BCTS	Canfor	Carrier	Conifex	Sinclar	Total
<b>Conventional</b>	72,503	54,369	1,438	2,100	27,684	158,094
<b>Cable</b>	5,745	5,842	39	3	4,300	15,929
<b>Inoperable</b>	14	48	48		231	341
<b>Mixed</b>	3,311	3,544			3,266	10,120
<b>Not Classified</b>	9	37				47
<b>Total</b>	81,583	63,839	1,524	2,103	35,481	184,530



Table ~~10~~<sup>11</sup> Licensee Previous Harvest Area (ha) by Operability Class

	ALRF	BCTS	Canfor	Carrier	ChuCho	CNC	Conifex	Dunkley	MLMCF	Sinclar	West Fraser	Total
Conventional	158	10,658	46,457	2,926	135	6,504	7,428	6,976	272	6,633	262	88,437
Cable		260	2,288	66		123	3	37		19		2,796
Inoperable			18	6								24
Mixed		169	2,946	142		486		241		61	7	4,052
Total	158	11,114	51,710	3,139	135	7,113	7,431	7,254	272	6,713	269	95,309

## Discussion

### Area under the Plan - Stuart Nechako and Robson Valley Natural Resource Districts

The decision to continue the focus of the 2020 IBS Action Plan on the Mackenzie and Prince George NRDs came after assessing the relative impact of the outbreak within in geographic area. As shown in Table 12 below, the infestation area within the Robson Valley is negligible. Within Stuart Nechako, the infestation area indicated by AOS coverage is not insignificantly different from that of the Mackenzie NRD but the concentration of the area with trace and low severity categories is substantial when compared against Mackenzie.

Table ~~11~~<sup>12</sup> AOS THLB by Severity Class

#### Spruce Leading and Secondary Spruce Stands (>35%)

##### AOS by Severity Class (ha)

Natural Resource District	T	L	M	S	VS	All Severity Classes	% of Trace and Low
Mackenzie	19,326	17,005	10,156	3,135	1,952	51,573	70%
Prince George	33,641	49,648	29,994	17,194	9,211	139,688	60%
Robson Valley	1,552	1,844	1,265	860	146	5,666	60%
Stuart Nechako	20,820	15,242	2,287	104	47	38,500	94%
	75,339	83,740	43,701	21,292	11,355	235,428	

\*Accumulated AOS, all age classes

Despite a continued focus on the Mackenzie NRD and the Prince George NRD, it is worth noting that there is an increased amount of IBS polygons identified by the AOS contained primarily within the northern portion of the Stuart Nechako NRD. Individual Forest Licensees have reported increases in spruce beetle activity within certain operating areas and the Stuart Nechako NRD is a geographic area that has the potential to represent a leading-edge scenario; more so than the epicenter of the current infestation focused on the Mackenzie NRD and the Prince George NRD. The infestation levels in Stuart-Nechako NRD warrants monitoring by the affected Forest Licensees, not all of whom are participatory on the current iteration of the 2020 IBS Action Plan.

Due to the additional complications of involving different BCTS business area staff or licensee staff at such short notice, the spatial action plans submitted by each Forest Licensee does not

address the Stuart Nechako NRD AOS polygons in a consistent manner. For that reason, the analysis of the spatial action plan within the Stuart Nechako NRD has not been included in the tables and scenarios associated with the 2020 IBS Action Plan. Where spatial plans were provided, these have been included on mapping products. A more consistent approach will be assured in the 2021 BS Action Plan.

### Action Plan Outputs

The updated Licensee AAC Capacity (Table 6) reflects a need to more accurately indicate the proportion of OSBMT AAC that is being directed towards the spruce beetle infestation. While previous iterations of the IBS Action Plan have not included a projection of AAC directed towards spruce beetle, the OSBMT has always 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 IBS 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 and, even 5 years into the infestation, is still ongoing. 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 in Table 8 (Planning Horizons) have increased from the 2019 IBS Action Plan to the 2020 IBS Action plan. This can primarily be attributed to the revised VRI stand definition that has increased the landbase which is under consideration for inclusion in the Action Plan. The revised AAC projections provided in Table 6 also contribute to an increased time frame to address the planned harvest designated in the Action Plan.

By including two defined harvest periods to address the entire seven year shelf life assumption, a level of uncertainty is introduced into the planned harvest polygons. Blocks currently considered for planned harvest are at varying stages of development and field confirmation. Blocks

contained within Harvest Period 1 are more refined as they are either under permit or being prepared for permit issuance. Blocks contained in Harvest Period 2 are likely not field confirmed and have the potential be reduced in area under a more refined operational planning exercise.

As noted in Table 8, the 2020 IBS Action Plan encompasses area outside of AOS polygons. The intent of the spatial retention and harvest plan components of the 2020 IBS Action Plan is to produce a tactical plan, as requested in the 2018 RED Expectations Letter to Licensees. A tactical plan, by definition, cannot be confined solely to the AOS polygons, as the AOS coverage is a completely non-operational input. The 2020 IBS Action Plan, while focused on spruce beetle infestation areas, must also address the other non-timber values that occur on the landbase in addition to considering operational constraints and logical harvest unit boundaries.

The remaining AOS depicted in Figure 4 demonstrates that the OSBMT continues to focus efforts on minimizing non-recoverable losses by addressing the most severely infested stands as identified by the AOS.

### Landscape Biodiversity Orders

The results of the 2020 IBS Action Plan analysis presented above show considerably less impact to the Prince George TSA LBO than was presented in the 2019 IBS Action Plan. While there are still impacts to the LBO, they are much less dramatic than previously indicated. A review of the 2019 IBS Action Plan analysis has revealed an error in accounting for old forest impacts which resulted in the 2019 IBS Action Plan retention polygons being drawn down from the available old forest reservoir twice. This error has been rectified in the 2020 IBS Action Plan iteration.

For clarity, the diagram below has been included to illustrate the differences between how the 2019 and 2020 IBS Action Plans accounted for the effects of spatially designated Action Plan retention on the amount of old forest surplus in relation to both the CFLB Old Forest Total and the CFLB Old Forest Targets from the Order.

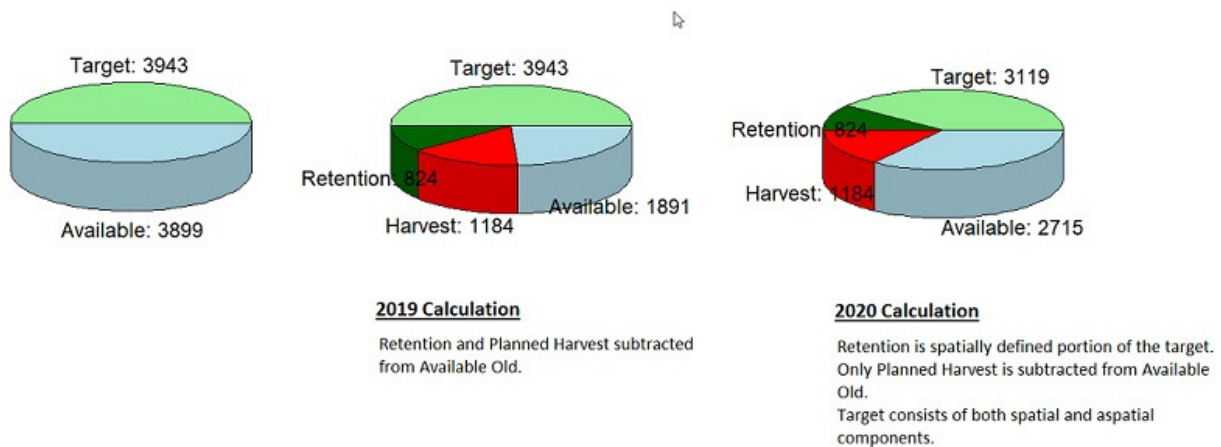


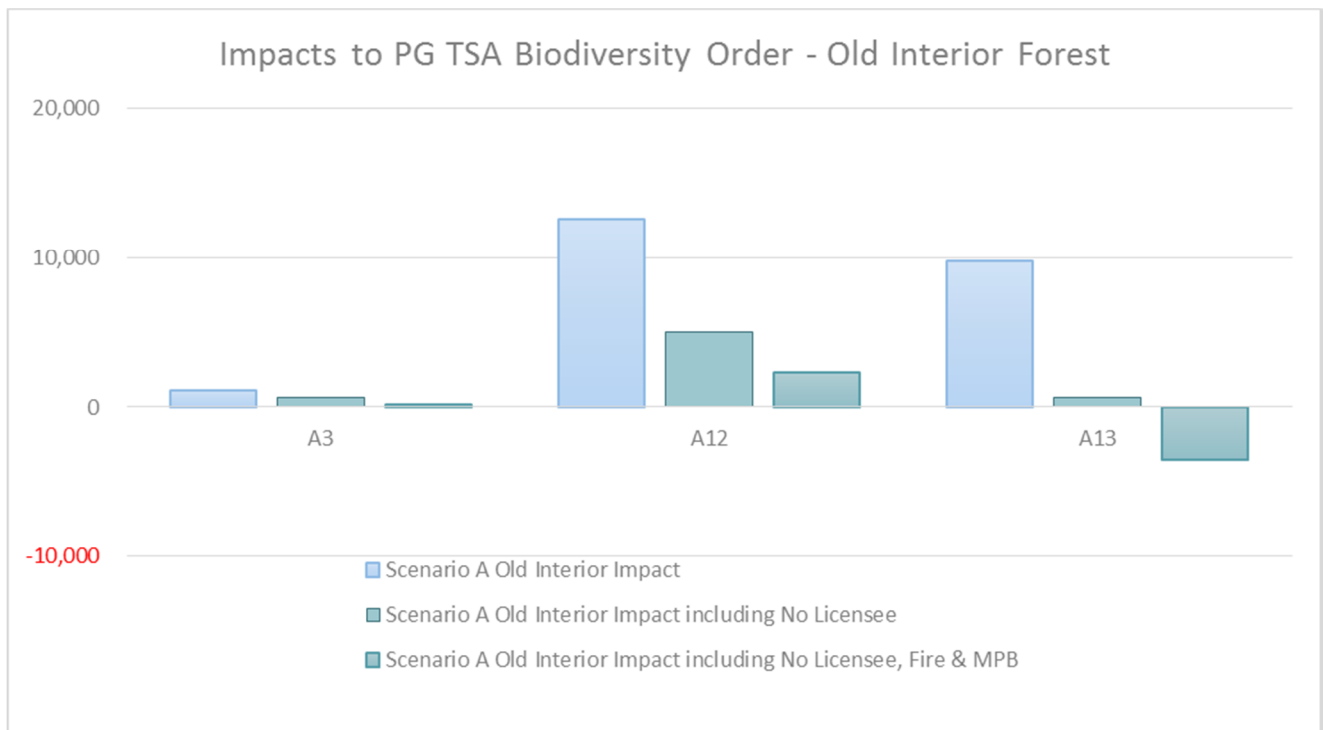
Figure 8 2019 vs 2020 IBS Action Plan Calculations for Old Forest Accounting

Despite the less dramatic results, Scenarios A and B still represent the most realistic scenarios in terms of impact to the LBOs. BCTS and Forest Licensees and MoFLNRORD will need to continue to work collaboratively to ensure that best efforts are made to address the obligations of the legal orders. For almost half of the mBECs within the Prince George NRD, the Old Forest surplus (hectares above target) is not large. The OSBMT still considers both AAC uplifts and additional tenures as increasing the risk of being able to manage within the legal framework of the LBO.

It is worth noting that an increased level of uncertainty to Old Forest impacts exists within Scenario C for both the Prince George and Mackenzie LBOs. Scenario C assumes that harvesting is concentrated in all stands with severity ratings of moderate through to very severe, along with 50% of the low severity stands within the NRD. Unlike Scenarios A and B, where the Old Forest impact is known because the Scenarios are based on spatial data or Scenario D, where all of the AOS stands are harvested regardless of severity rating, there is no way to quantify the amount of old contained in the 50% of the low severity stands included in Scenario C.

Again, within the Prince George TSA LBO, Old Interior Forest has been a topic of discussion. Within the LLOWG data, each individual licensee contributes to meeting the target for each unit. Many mBECs contain an area associated with "No Licensee" and this area is included in the consolidated Old Forest Interior accounting for each unit. There are mBECs where the "No Licensee" operating area contribution to Old Interior Forest is substantial, creating a situation where a significant portion of Old Interior Forest for an mBEC unit is not under management of a Forest Licensee. Three mBECs where this occurs have been illustrated in the Figure 8.

Figure 9 Comparison of Scenario A Impacts to Old Interior Forest within Select mBECs, in consideration of "No Licensee" operating area and Old Interior Losses to Fire and Pine Beetle



For example, within mBEC A13, the No Licensee portion of the Old interior surplus consists of 9,109 hectares of park, while the target for old interior is 10,732ha. This leaves a managed surplus of 2,306 ha within control of the Forest Licensees, whereas the Total surplus indicated in the most recent LLOWG displays 11,415ha. The amount of Old Forest within the A13 has particular importance due to the mBEC's overlap with significant Environmental Stewardship Initiative (ESI) values. It is a concern of some Forest Licensees that Old Interior is not being sufficiently considered when ESI areas are being set aside.

This issue is outside of scope for the OSBMT and has been brought forward to the LLOWG for further investigation. The designation of the No Licensee component of Old Interior has not been investigated for all mBECs at the time of submission of this report. It has been included as an item to address in the 2020 LLOWG analysis and the OSBMT maintains that this issue is most appropriately addressed through the LLOWG forum.

### Chief Forester's Retention Guidance

The 2020 IBS Action Plan attempts to manage the spruce beetle outbreak while maintaining the guidance set out in the *Stand and Landscape-Level Retention for Harvesting in Response to Spruce Beetle Outbreaks* released by the Chief Forester's Office in 2017. This was accomplished in the following manner.

For this plan, individual Forest Licensees completed planning at the landscape level with the inclusion of Retention as an IBS Action Plan Code. The IBS Action Plan Codes were then further defined with subcategory options, one of which was the Chief Forester Retention Guidance. This was used to define retention areas that are planned on the landscape but not legally designated through a site plan as wildlife tree reserves. This process allowed the OSBMT to have more detailed landscape level plans within the 2020 IBS Action Plan than previous iterations of the plan.

During the analysis portion of this plan, the OSBMT looked at the Landscape Biodiversity Orders for Prince George and Mackenzie and completed harvest scenarios to see how the objectives of those Orders were affected when spruce beetle is harvested at different intensities. Moving forward, this type of information can be used as a tool for future management decisions in relation to both forest health and landscape biodiversity.

Legal wildlife tree retention area from site plans have been incorporated in the Retention areas associated with the 2020 IBS Action Plan. This information was missing from the 2019 iteration of the IBS Action Plan due to issues with data recorded in RESULTS. It has been included this year because the existing wildlife tree retention areas constitute an important component of landscape level retention. While the 2020 IBS 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 Chief Forester's Guidance. It is important to note that a proportion of the retained and deferred volume from the 2020 IBS 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 landbase.

The 40 year threshold for patch size contained in the Chief Forester's Retention Guidance has not been run on the 2020 IBS Action Plan. The legal patch size requirements for both the Prince George and Mackenzie LBOs classifies young seral at 20 years. Patch size targets for landscapes where multiple operators are present are notoriously difficult to manage for. The OSBMT is awaiting the 2020 LLOWG analysis for the Prince George TSA. This analysis contains the results from the 5 year increments for patch reporting and addresses both 20 and 40 year patch scenarios, which would allow for its inclusion in the next iteration of the IBS Action Plan.

### 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 (Harvest Prioritization Matrix) was considered but has not been incorporated into the 2020 IBS Action Plan. At the time of submission of the 2020 IBS Action Plan, the Harvest Prioritization Matrix is still in draft form. The members of the OSBMT have both been offered, and accepted, the opportunity to engage in discussion about the intent of the matrix and its guidance since it was first put forward in May 2018.



The Harvest Prioritization Matrix is a tool that assumes harvest plans can be easily revised once cutting permits are issued. It also 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 in order to secure harvest authorizations do not fit within the timing assumptions of the Harvest Prioritization Matrix.

Also of issue is the matter of relative scale. The scale of the 2020 IBS Action Plan is not conducive to using the matrix. The IBS Action Plan framework is, by necessity, an exercise that utilizes strategic level datasets across multiple TSAs to approximate a best guess of harvest plans over a seven year time period. The Harvest Prioritization Matrix is simply too refined to be effective at the scale that the IBS Action Plan operates.

The Harvest Prioritization Matrix presents other challenges in implementation. Its application in draft form between NRDs appears to be inconsistent, causing confusion in how it should be considered within the 2020 IBS Action Plan.

The OSBMT would also like to highlight what appears to be a contradiction of MoFLNRORD expectations in relation to spruce beetle management. The request for an IBS Action Plan was initially to ensure that Forest Licensees with affected operating areas could justify the actions being taken to manage infestation levels. The basic assumption has always been to address moderate, severe and very severe severity polygons along with a proportion of low severity polygons in order to ensure the economic value of these stands are fully captured and non-recoverable losses are minimized. This guidance, or assumption, does not align with the priority ratings as set out in the Harvest Prioritization Matrix. Not all the stands that are being targeted within the IBS Action Plan framework necessarily represent priority harvest stands based on the matrix, where the highest priority stands are supposed to have greater than 50% dead and greater than 30% live spruce beetle present at time of harvest. The 2020 IBS Action Plan is based on accumulated 2019 AOS data, where only the very severe classification is greater than 50% attack and the live infestation is not recorded. As a result, the 2020 IBS Action Plan does not relate easily to the criteria in the Harvest Prioritization Matrix.

### Representative Harvest in all Forest Types to Support AAC

Previous plans have identified areas of steep slope terrain. Expertise in both timber development and harvesting within these areas has diminished over the past number of years. While efforts are underway, rebuilding this sector of the industry takes significant financial investment and time.

In the 2020 IBS Action Plan, the OSBMT has designated a significant amount of cable ground to be in the planned harvest category or deferred category (Table 10). 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 are actively working with the contractor base to increase the capacity to operate in these areas.



## Considerations

During the development and creation of the 2020 IBS Action Plan, there were many considerations and constraints on the land base that were necessary to incorporate. These factors resulted in producing a spruce beetle plan which addresses AOS polygons through one of three actions: planned harvest, deferred areas or retention. Some of these constraints increased the importance of harvesting dead spruce. Examples of considerations that would lead to an increased focus on harvesting would be reducing the wildfire hazard around communities and concerns about economic return related to shelf life and stand degradation.

However, most of the considerations reduced the OSBMT's ability to harvest spruce beetle infested stands. Some considerations are existing legal constraints which have been exacerbated due to the effects of the spruce beetle outbreak. Managing for old growth targets in relation to LBOs, General Wildlife Measures in relation to Ungulate Winter Ranges and ECA thresholds in Fisheries Sensitive Watersheds are long term existing constraints on the landbase that must still be met, regardless of any forest health factors. Partition requirements within the Mackenzie Natural Resource District are considerations for affected licensees to concentrate on minimizing the level of green bycatch in infested stands. The Environmental Stewardship Initiative (ESI) is an umbrella framework that seeks to introduce additional requirements in multiple stewardship areas. Each of these will have compounding effects on individual licensees' ability to exercise timber harvesting rights. In addition, the work done through the ESI framework has not been finalized. The uncertainty associated with this is an additional complication when attempting to create a long term forest health management plan. The current economic conditions in the forest industry are reducing licensee capacity to harvest spruce beetle stands. Connections to global markets and their associated volatility have effects on industry stability making it difficult to implement long term plans. These considerations were incorporated in the Attribute Data Dictionary in an attempt to best illustrate how these overlapping values are playing out within spruce beetle infested stands.

## TFL 30

During the analysis phase of the 2020 IBS Action Plan, it became apparent that Canfor's inclusion of TFL 30 into the spatial component of the Action Plan was problematic. As an area based tenure, the scrutiny on performance in relation to actioning AOS polygons is different than the scrutiny applied to management of infestations occurring within licensee operating areas within the Prince George TSA.

In both the 2019 and 2020 IBS Action Plans, Canfor submitted spatial polygons for inclusion in the map outputs of the Action Plan. In this 2020 iteration of the IBS Action Plan, it became evident that TFL 30 needed to be split out as a separate management unit so as not to confuse how much AOS falls into the larger Prince George TSA management unit. In line with that reasoning, the TFL 30 AAC has been removed from the Licensee AAC capacity tables and the

Planning Horizon table also deals solely with the volume based tenures within the Prince George TSA.

While Canfor continues to monitor and address spruce beetle within TFL 30 and will continue to submit a spatial action plan for inclusion on mapping products, the place of an area based tenure within a plan that was initiated to justify management actions and their implications for AAC allocations within a volume based management unit is in question. Further discussion with Canfor representatives and MoFLNRORD staff is recommended to re-assess whether the inclusion of TFL in any form is appropriate for subsequent iterations of the IBS Action Plan.

## Conclusions

### Recommendations to Government

1. Provide clear messaging with respect to the hierarchy of guidance documents, as there is currently a lack of clarity on which documents take precedence.
2. Continue including Forest Licensees when looking at ways to better our management strategies for spruce beetle.
3. Provide opportunities for the OSBMT to review and comment on spruce beetle outbreak messaging prior to public release.
4. Any additional tenure opportunities related to addressing forest health factors are referred to Forest Licensees in a transparent manner.
5. Consider changing the format of the IBS Action Plan to a spatial submission and summary tables.
6. Increase engagement from MoFLNRORD staff within the Stuart Nechako NRD in regards to spruce beetle management.
7. Clarify how forest health should be prioritized in relation to other land use objectives.

### 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. To build upon long-term landscape level retention within spruce beetle impacted areas to mitigate impacts to all non-timber stakeholders.
  - e. To work with regional entomologist to understand survey data.
2. Initiate discussion with MoFLNRORD on which IBS 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. Consider analysis for stand-level volume declines over time, to complement other shelf-life studies.
4. Consider ways to assess trends in performance between iterations of the IBS Action Plans. Additional considerations to how feasible this would be include:
  - a. Harvesting IBS infected stands that do not show up in the AOS Survey data
  - b. Aspects of business that Forest Licensees have no control over (ie. Market volatility)
  - c. Shelf life and the operability challenges older from dead stands present.
  - d. Changes in AAC Allocation and changes to Forest Licensee Operating Areas.
  - e. Comparing different iterations of the action plan will be difficult as the definition of applicable stands has changed over time
5. Work with the Prince George TSA LLOWG to clarify the Prince George TSA Landscape Biodiversity Objectives reporting protocol for the use of recruitment strategies, including what the levels of old forest or old interior forest are required to initiate a recruitment strategy and what tests must be met for a recruitment strategy to cease to apply

## Appendices

### Appendix A

AOS Summary by mBEC and Licensee and Severity Class for Prince George and Stuart Nechako NRD

See Excel document: *Appendix\_A\_B\_C\_D\_2020\_IBS\_Action\_Plan.xlsx*

### Appendix B

AOS Summary by Grouped Landscape Unit, Severity Class and Licensee for Mackenzie NRD

See Excel document: *Appendix\_A\_B\_C\_D\_2020\_IBS\_Action\_Plan.xlsx*

### Appendix C

Spruce Beetle harvest scenario impacts on Old, and Old Interior and Mature categories for NRDs within the Prince George TSA

See Excel document: *Appendix\_A\_B\_C\_D\_2020\_IBS\_Action\_Plan.xlsx*

### Appendix D

Spruce Beetle harvest scenarios impacts on Old, and Old Interior and Mature categories by Grouped LU for Mackenzie

See Excel document: *Appendix\_A\_B\_C\_D\_2020\_IBS\_Action\_Plan.xlsx*

### Appendix E

MoFLNRORD Reporting and Summary Tables

See Excel document:

*Appendix\_E\_Omineca\_IBS\_Area\_and\_Volume\_Summaries\_2019-2020\_final\_revised\_june2020.xlsx*

E1 - Intro

E2 – Action Plan

E3 – Planning Horizon

E4 – Action Plan II

E5 – Non Actioned

E6 – MK LLOWG



E7 – CFLB

E8 – TSA – TFL

E9 – Company

E10 – mBEC

E11 – LU

E12 – ESA

E13 – Age Class

E14 - Operability

### Appendix F

OSBMT Hauling and Milling Strategies

### Appendix G

Maps:

Action Plan 2020 (Prince George)

Action Plan 2020 (Prince George with Restrictions)

Action Plan 2020 (Mackenzie)

Action Plan 2020 (Mackenzie with Restrictions)