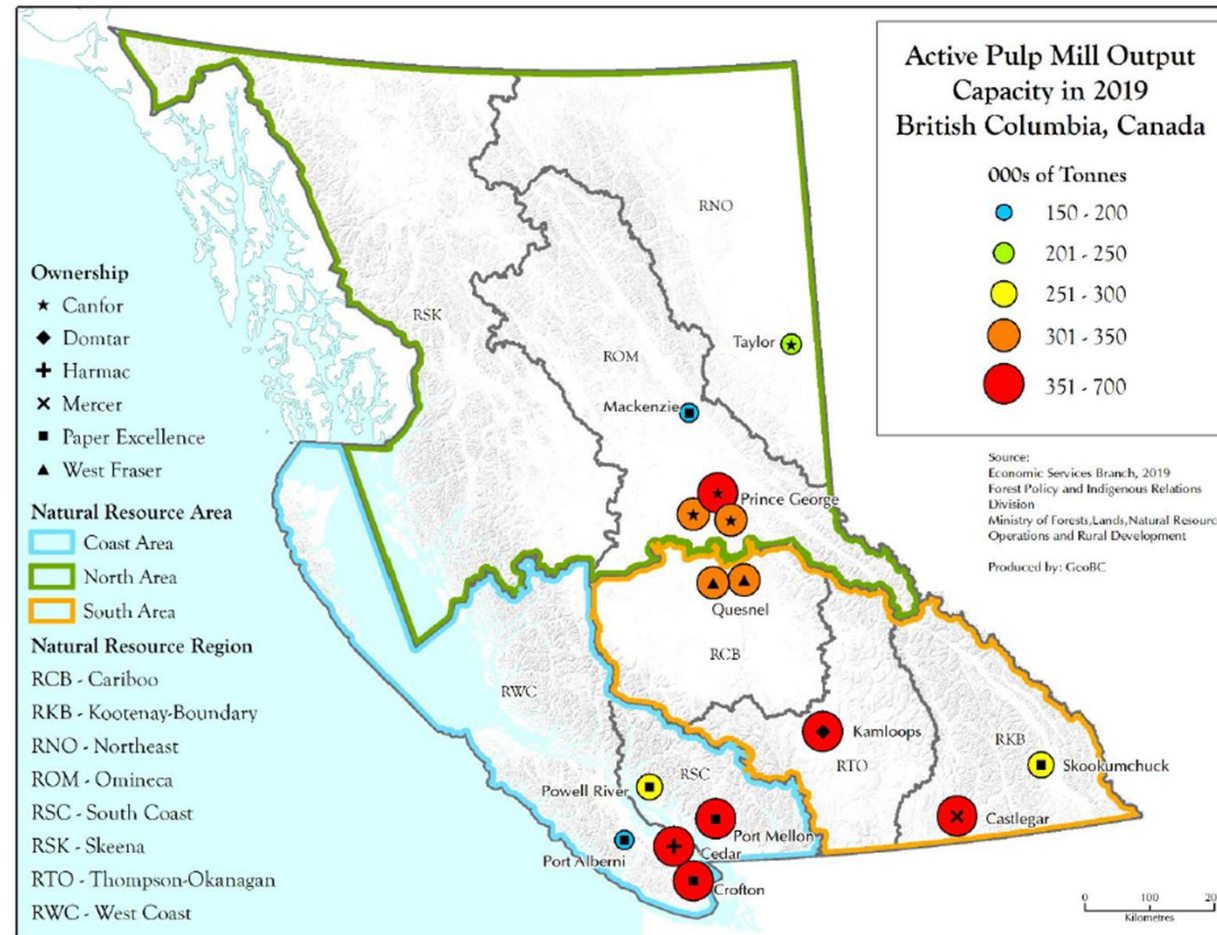


Pulp Mills in BC Face a Challenging Fiber Supply/Demand Outlook. What's next for these mills in BC?



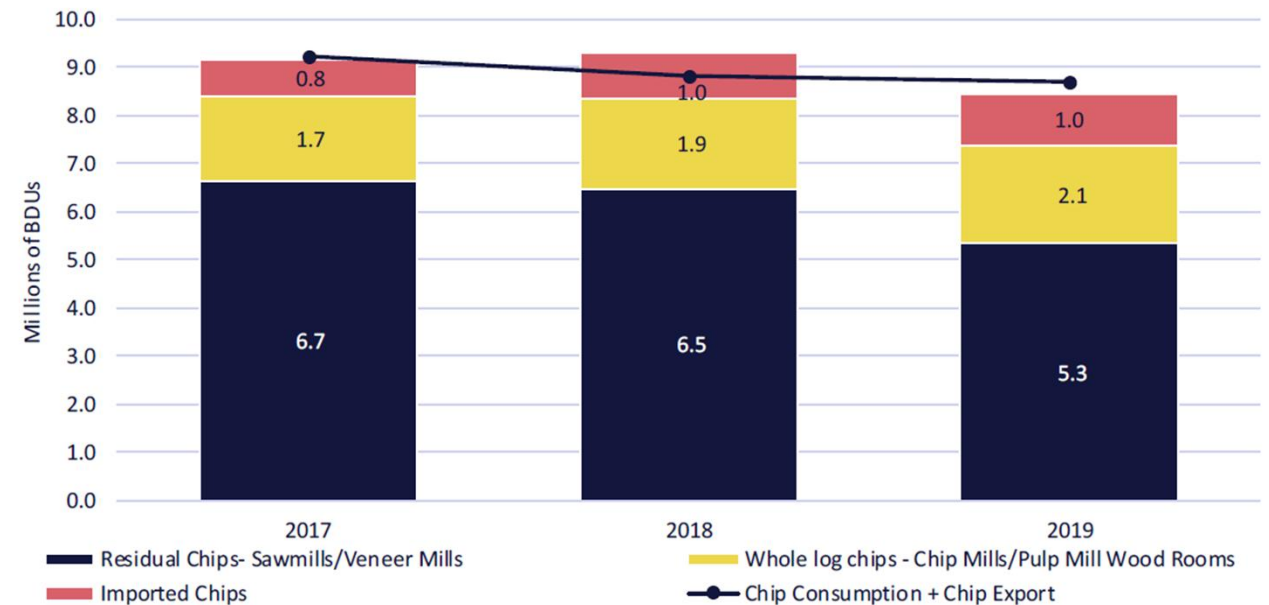
Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2019

In 2020, there were 15 pulp mills operating in BC with five mills on the Coast, and 10 mills in the Interior.
(Note: a few of these mills have been curtailed or permanently shut down)

The Big Picture

Supply and Demand of Wood Chips in BC, 2019

- BC pulp mills processed over 22 million cubic meters of fiber, down 15% in 2019 from 2018.
- Pulp mills consumed about 15 million cubic meters of residual chips produced by sawmills and veneer mills, accounting for 67% of their fiber input.
- Pulp mills also used about 5.8 million cubic meters of whole-log chips supplied by chip or pulp mills, representing over 26% of their total fiber input.
- The rest of fiber input (1.2 million cubic meters) was supplied from imported chips and harvest residuals.
- The residual chip supply declined by 18%, from 6.5 million bone dry units (BDUs) in 2018 to 5.3 million BDUs due to mill curtailments and closures in 2019.
- As alternative fiber sources, the supply of whole-log chips and imported chips were up 12% and 9% respectively in 2019 over 2018.



Source: 2019 BC Mill List Database and BC Stats

Provincial Chip Supply and Demand – 2017 to 2019

Fiber Basket Evaluation

Primary factors that impact the wood chips availability for the pulp sectors in BC and Alberta:

- Natural disturbances: In the late 1990s, after several relatively warm winters, a massive Mountain Pine Beetle (MPB) outbreak caused the loss of millions of hectares of pine forest in British Columbia over the next 15 years
- Forest Fires: BC has experienced Back-to-back record fire seasons in recent years, in particular 2017 and 2018
- Sawmill Closures: Weak lumber market conditions, fiber supply constraints and higher log costs have continued forcing sawmill indefinite/permanent closures and curtailments in recent years, in particular 2018 and 2019.
- Forest Policy, Regulations and Environmentalist Reforms: Given the nature of forest ownership in BC (Crown Lands), the timber harvesting inventories are prone to change with the new policies and environment reforms that aim at protecting the wildlife and old-growth trees (reduced inventory). The provincial government has the authority to develop policies and revise the Annual Allowable Cut (AAC) considering the impact natural disturbances such forest fires and MPB outbreaks, by allowing the harvesting of damaged standing timbers (increased inventory).

Impact of MPB Outbreak on the Fiber Supply in BC Interior

- The Mountain Pine Beetle (MPB) has always been a natural element of B.C.'s interior pine forests. An abundance of mature lodgepole pine, combined with mild winters and uncharacteristically hot, dry summers, led to an unprecedented epidemic. The epidemic peaked in 2004 and has rapidly declined since then.
- By 2021, the mountain pine beetle outbreak had essentially run its course. To date, it is estimated that over 18.5 million hectares (45.7 million acres) of B.C.'s Interior forests are affected.
- Wood from beetle-affected trees will retain its commercial value for sawlogs 8 - 12 years after the tree has died.
- B.C.'s Chief Forester temporarily increased allowable harvest levels in areas affected by the beetle to recover economic value from the beetle-affected trees and speed replanting. The government has also offered licenses to encourage alternative emerging industries such as bioenergy and pellet plants.
- As the beetle-affected timber no longer becomes salvageable, the province's overall supply of mature timber in the Interior is expected to decrease by about 20% in the mid-term (next 10 - 15 years) when compared to harvest levels before the mountain pine beetle epidemic.
- 27 wood processing mills have closed since 2006 due to the gradual shortage of wood fiber due to this outbreak. Some of these mills have been closed by the major players such as Canfor, West Fraser and Tolko to supply sawlogs from their closed mills to other operating mills in BC Interior.

Post-Mountain Pine Beetle Forest Industry in BC

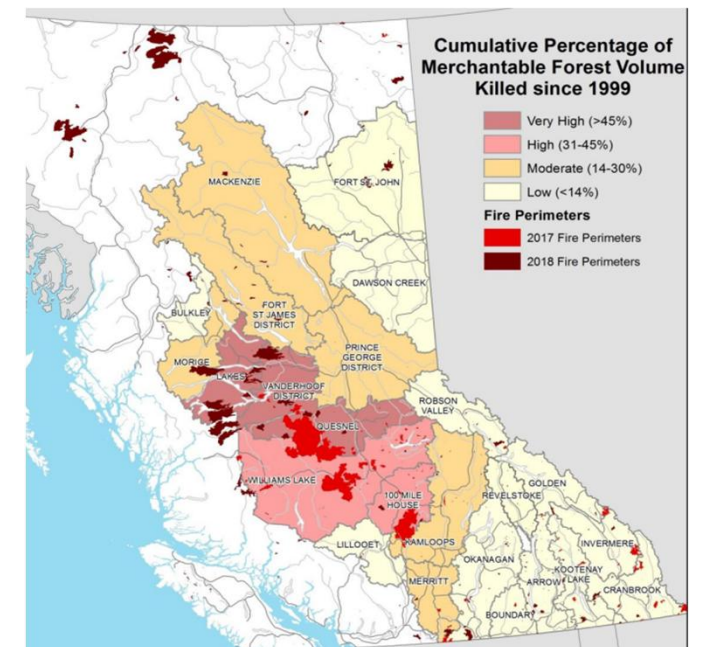
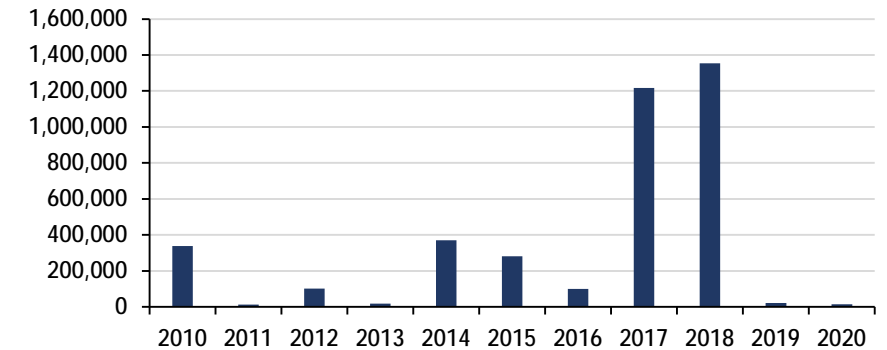
Although the BC Interior Mountain Pine Beetle (MPB) epidemic is effectively over, it continues to impact the BC forest industry in several ways:

- After a decade-long uplift to the BC Interior's AAC that was implemented to support the salvage of MPB-killed pine, harvest levels have declined in many BC Interior Forest Management Units (FMU's). These AAC reductions reflect a reduced availability of both sawlogs and pulp logs and a progressive shift by forest companies away from salvaging dead pine stands to green stands of timber.
- More management unit AAC declines will occur soon. The BC Interior's midterm AAC should stabilize by 2024 at a level that is lower than the BC Interior AAC before the onset of the MPB epidemic.
- Both the AAC reductions and a shift away from harvesting in dead pine stands is significantly reducing the volume of pulp logs and post-harvest road-side residues.
- Further timber harvest reductions and mill closures lie ahead, not just from the remaining impact of the mountain pine beetle, but also because of a new spruce bark beetle infestation, and losses from two years of devastating forest fires.

The Impact of Forest Fires

- As shown in the Figure, BC experienced two worst fire seasons in 2018 and 2017 on record with 2,115 fires and 1.35 million hectares burned in 2018 and 1,353 fires and over 1.22 million ha were burned in 2017.
- The 2017 wildfires were concentrated in the Quesnel, Williams Lake and 100 Mile House Timber Supply Areas (TSAs) – units with high-to-very-high merchantable forest volume killed by the mountain pine beetle. The 2018 wildfires were more dispersed but still affected the Lakes and Quesnel TSAs, and the Vanderhoof portion of the Prince George TSA – units highly affected by the mountain pine beetle.
- About 300,000 hectares (23%) of the area affected by the 2018 fires occurred in the Timber Harvesting Land Base (THLB), the area legally available and economic to harvest. Both Prince George and Quesnel TSAs were among the units most affected by the 2018 fires. In comparison, about 700,000 hectares (~58%) of the area affected by the 2017 fires (within fire perimeters) was within the THLB.

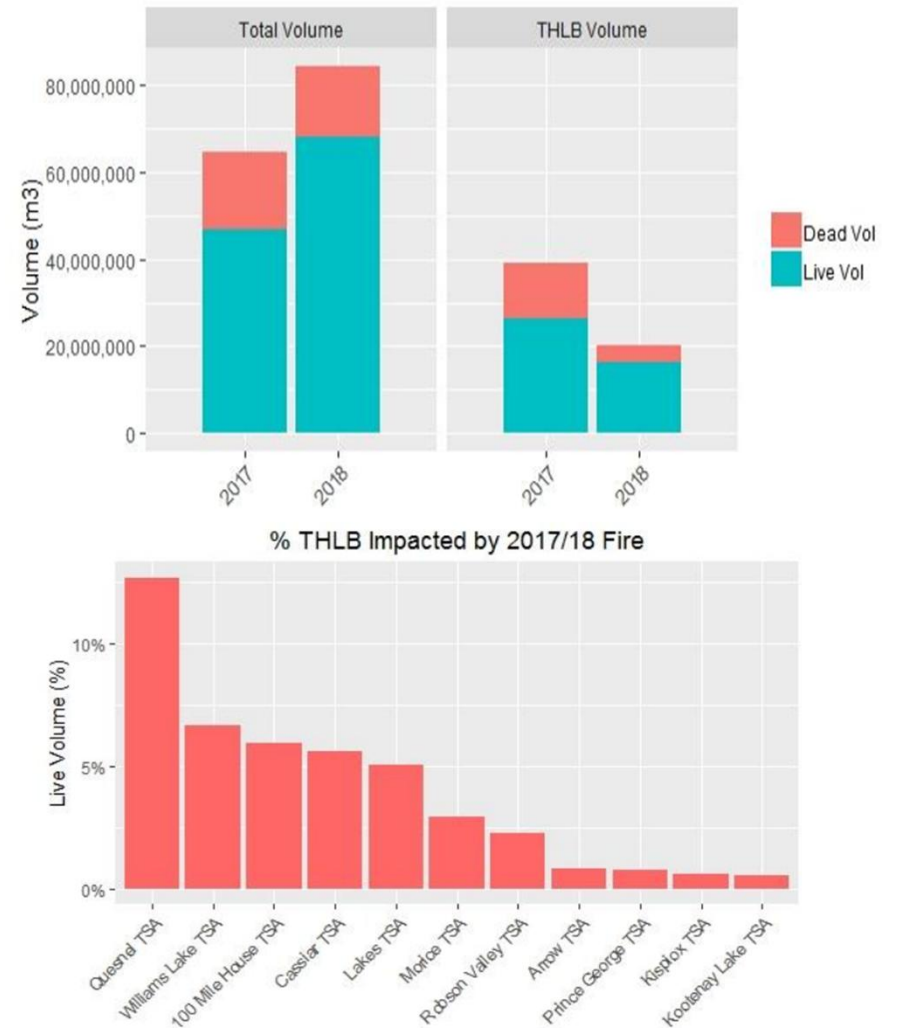
Total Burned Area (ha)



Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2019

Forest Fires – Timber Volume Loss

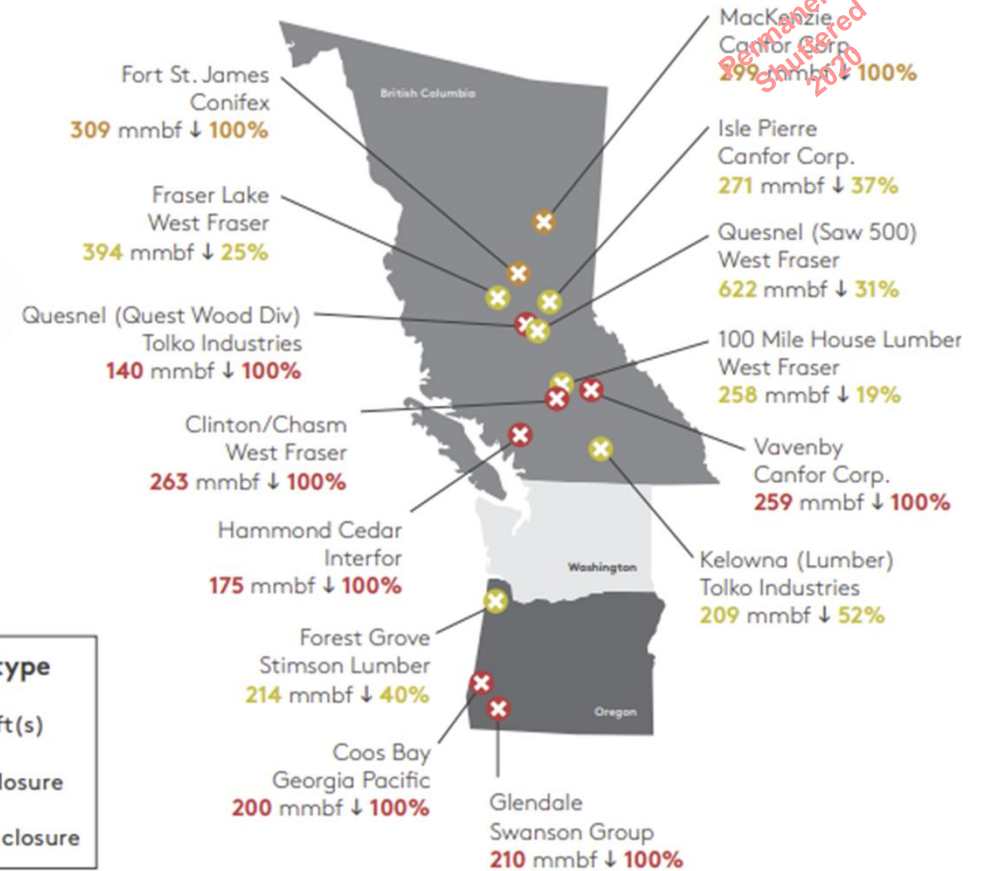
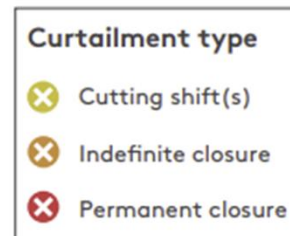
- As shown in the first Figure, both the overall total forest volume losses, and the overall timber volume losses within the THLB, from the 2017 and 2018 fires. More forested volume burned in 2018 than in 2017, but less timber volume burned in the THLB in 2018 than in 2017.
- The second Figure shows live (green) timber volume losses due to both the 2017 and 2018 fires expressed as a percentage of the total live volume within the THLB from the most affected TSAs.
- The three most affected TSAs include the Quesnel (12.7%), Williams Lake (6.7%), and 100 Mile House TSAs (5.9%) with losses largely a result of the 2017 fires. The Quesnel TSA also experienced notable losses due to the 2018 fires.
- The Forest Analysis and Inventory Branch assessed the timber supply impacts from the 2018 fires for the affected TSAs. Based on the assessments, none of the AACs need to be re-determined immediately although some will likely be revisited before the planned AAC determination dates.



Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, 2019

Sawmill Closure Impact on BC Pulp Mills

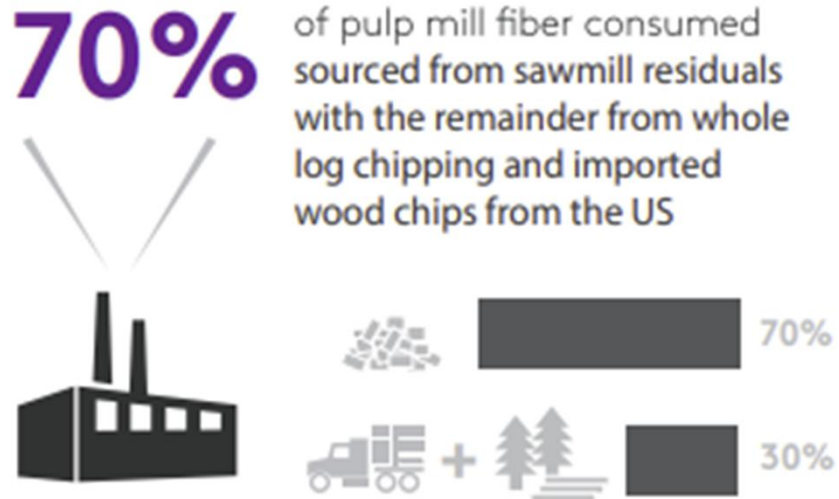
- Sawmills in British Columbia are being forced to shut due to the weak lumber market combined with the Annual Allowable Cut limiting sawtimber availability.
- The Figure shows the sawmill curtailments in 2019 in BC:
 - Four permanent closures (in red)
 - Two indefinite curtailments (in orange)
 - Five mill shift reductions (in yellow)
- Nearly 2.0 billion Board Feet of capacity was removed from BC in 2019 alone, which represents 14% of BC's existing capacity base at the end of 2018.
- The current wave of mill rationalization would likely have started earlier, but a strong U.S. economy drove the demand and prices for lumber so high it made it economic to continue processing wood products from a shrinking timber supply, despite rising log costs and American softwood lumber tariffs.
- While a recovery of lumber prices in the U.S. could postpone more curtailments and mill closures, the long-term prospects are that the B.C. Forest sector will inevitably continue to shrink.



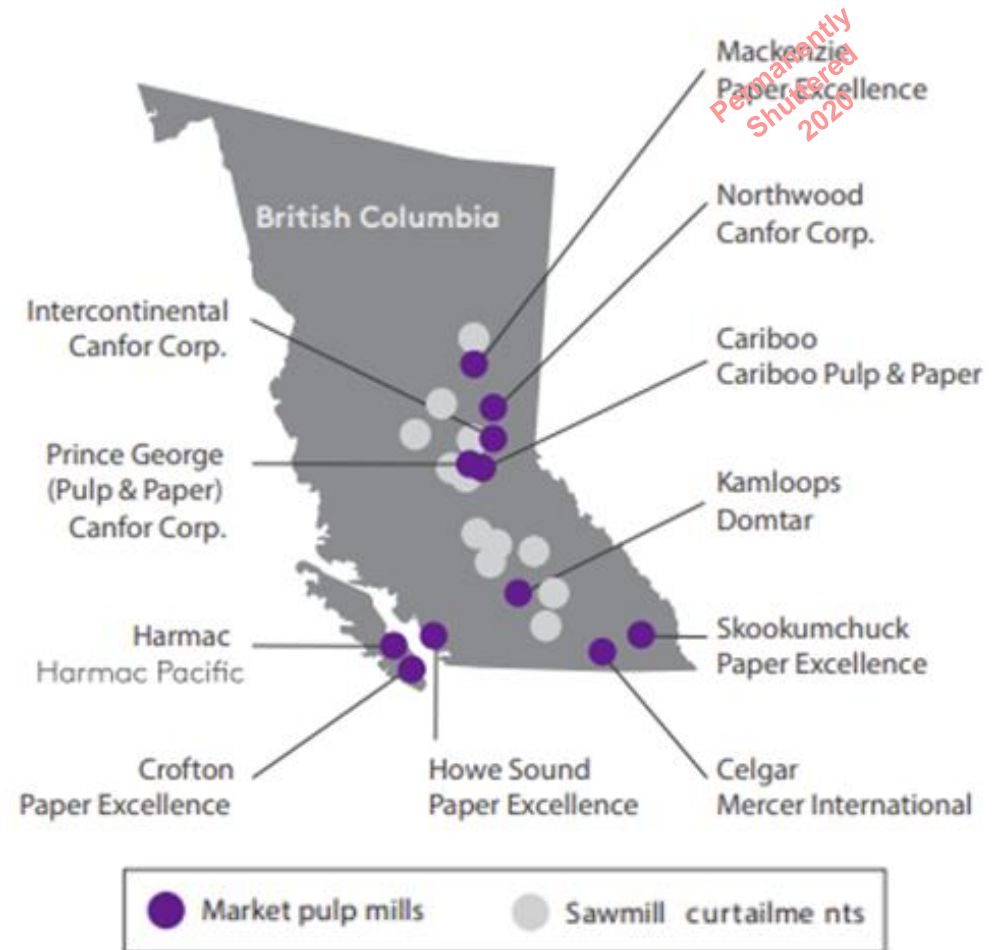
Source: RISI Inc., 2019

Sawmill Closure Impact on BC Pulp Mills

- The Figure shows the location of BC pulp mills relevant to the 2019 sawmill curtailments.
- Sawmill closures resulted in a loss of more 10% of the fiber supply. This has significantly increased pulp mill demand for pulp logs.
- The requisite decline in sawmill residuals from the sawmill closures roughly equal to the fiber needs of one large or two smaller pulp mills in the region.



Source: RISI Inc., 2019



Source: RISI Inc., 2019

Environmental Reforms Potential Negative Impact on Timber Supply

- Environmentalists are pushing hard for the government to stop logging in old-growth forests until updated strategies are in place to better manage the population of old trees.
- Protests against logging have occurred prominently on Vancouver Island, but also in Prince George and Nelson. This will cause serious implications to the timber industry. It is expected to see up to four sawmills on the coast, and up to five in the interior permanently shutdown if environmentalist policy reforms are implemented.
- There's potential for a 1 million cubic metre decrease in AAC on the coast, and a 3 million cubic metre decrease in the Interior should the government take the recommendations from environmentalists which include banning logging on old-growth forests and caribou protection mandates.

Environmental Reforms Potential Negative Impact on Timber Supply

- Caribou protection mandates, which are coming mainly from the federal government, would also reduce the AAC for the interior forest industry. A plan to protect the southern mountain caribou in the Peace region is already in place.
- If the Peace region plan is repeated for all other caribou herds, it will remove 10% of the Interior AAC. A 1% reduction in the cut approximately equals the average output of a sawmill in the province.
- The industry accepts that it will lose some timber to things like caribou habitat protection. However, some trade-offs could be made that would mitigate the impact of an ever-shrinking timber supply, one of which would allow commercial thinning, which might at least save pulp mills.
- Commercial thinning is when loggers go into younger, dense stands of forest not yet ready for conventional harvest and weed out damaged or deformed trees for pulp wood. It could probably offset 10% or 20% of what the downfall might be. The industry has been pushing for larger-scale commercial thinning, as done in most other jurisdictions in the world, but government has so far, not gone down this path.

Supporting Policies and Programs to Increase the Use of Underutilized Forest Fibers in BC – Is It Enough?? (1 of 2)

- The common practice in BC before MPB epidemic was to harvest mainly merchantable sawlogs by tenure holders and leave logging residues (e.g., tops, bottoms and branches) and merchantable logs behind in the forest stands and burn them eventually. Non-sawlog/non-merchant timbers within merchantable stands are part of the current timber inventory within AACs not commercially viable to be harvested. Long distance from the marketplace, low quality of some of the tree species for lumber manufacturing, small size, damage by insects, fire and disease, steep terrains, expensive harvesting operation and the current market price of forest products make these standing timbers commercially unattractive to harvest.
- Because of MPB epidemics, the BC Government has been developing various programs and incentives to maximize the use of underutilized logging residues and non-merchant timbers:
 - Cut Clear Regulation: To encourage utilization of Grade 4 (pulp logs) and to limit timber left in the bush, Section 17 (6) of the Cut Control Regulation (Grade 4 credit) allows licensees to apply for a cut control credit for any Grade 4 log shipped to a facility other than a sawmill or veneer plant ((i) a mill that produces pulp, paper or newsprint, (ii) a chipping plant, or (iii) another facility that produces products from timber other than lumber or veneer).
 - Provincial Logging Residue and Waste Measurements Procedure Manual: Waste assessments are carried out to quantify the volumes of merchantable timber and waste left on the harvested areas following the completion of primary logging. The waste volume data compiled from the assessments are used to invoice licensees for monetary and cut control charges if these wastes are not used by a secondary mill.

Supporting Policies and Programs to Increase the Use of Underutilized Forest Fibers in BC – Is It Enough?? (2 of 2)

- **Residual Fiber Utilization Policy:** The Fiber Recovery Policy focuses on improving the use of lower-quality timber in areas of the province where there is a demand for the residual fiber from secondary users (pulp mills, pellet plants, bioenergy facilities, and other users of low-quality logs) and business-to-business relationships have not been established.
- **Forest Enhancement Society of BC** funded by BC Government, has been offsetting the entire/portion of cost of transportation and collection of underutilized forest fibers in BC. This fund has been used by pulp mills in BC Interior to reduce the cost of pulp logs delivered to their mills.

What's next for the Pulp Industry in BC??

- Permanent mill closures and conversions to UBK, and mill transition to packaging grades.
- Higher profitability of UBK drives mills to swing to UBK. Higher UBK yield offsets increased fiber costs resulting from declining sawmill residual chip supply.
- Will higher fiber costs with increased, more expensive pulp log furnish, drive price increases for NBSK, or incentivize higher yield UBK production?
- Will NBSK become more of a specialty pulp due to a tighter Supply/Demand balance, with mill closures and production swings to UBK?