

Wood Supply and Economic Impact Analysis



Assessment of Caribou Prescription Options defined as part of the CFSA-ESA Integration Project

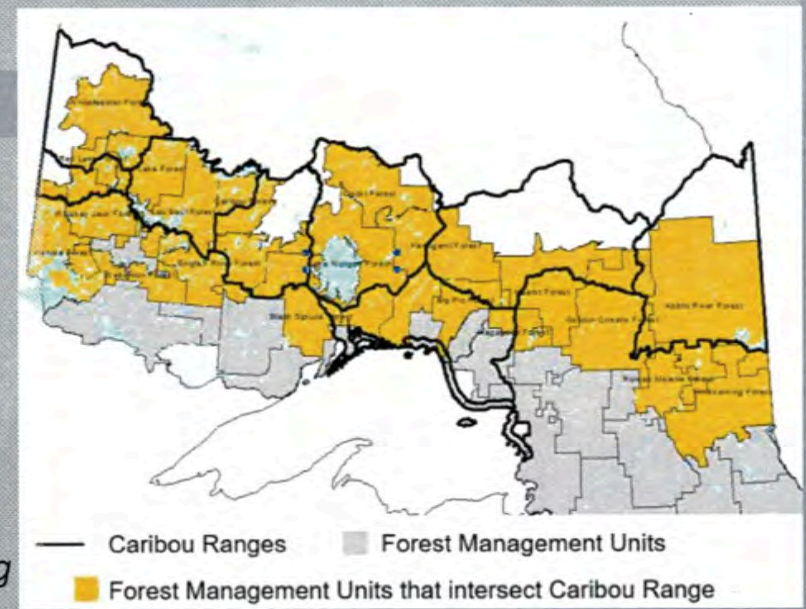


CFSA-ESA Integration: Woodland Caribou

- Caribou prescription options assessed:
 - Baseline: FMP plus meet Boreal Landscape Guide (BLG) targets and milestones for forest composition and structure
 - Caribou 1: Baseline plus meet BLG targets and milestones for caribou habitat (mandatory) and forest composition and structure (milestone flexibility if needed to achieve caribou habitat), no harvest permitted in Category 1 habitat
 - Caribou 2: Caribou 1 with an additional requirement to achieve 35% disturbance target within 30 years.
 - Caribou 3: Caribou 1 with an additional requirement to achieve 35% disturbance target within 50 years.

Results from 4 study areas (Caribou Forest, English River Forest, Black Spruce Forest, Abitibi River Forest) were extrapolated to forest management units that intersect caribou habitat ranges (20 MUs).

Refer to Appendix 1 for an overview of wood supply modelling



Impacts Summary

Measure	Caribou 1 ^{Not a Real Option}	Caribou 2	Caribou 3
Provincial expected number of direct/indirect full-time equivalent (FTE) job loss	278 jobs	2837 jobs	1452 jobs - Just Forestry - Concentrated to Northern Coast.
Expected reduction in provincial Gross Domestic Product (GDP)	\$ 27 M/yr	\$ 271 M/yr	\$138 M/yr
Provincial expected loss in tax revenue Taxes include federal, provincial and local taxes; total of Personal income tax, Harmonised sales tax, Tariffs, Corporate profit tax, Property & business tax, Tobacco & liquor tax. <i>- Concentrated Impact. - Conservative #'s</i>	\$ 16 M /yr	\$ 166 M /yr	\$85 M /yr
Provincial reduction in volume processed by primary/secondary facilities Processed volumes include processing of sawmill by-products	0.25 M m ³ (-1.0%)	3.26 M m ³ (-13%)	1.59 M m ³ (-6.3%)
Expected number of mill closures and existing re-starts unable to proceed	0 (2 mills below 95% and 1 mill below 90% of their wood supply requirement)	4 ^{- multiple other closures due to dependencies.} (an additional 8 mills below 90% of their wood supply requirement)	2 (an additional 5 mills below 90% of their wood supply requirement)
Reduction in total industry wood supply requirement	0 (baseline 20.2M m ³ /yr)	1.1 M m ³ /yr (baseline 19.1 M m ³ /yr)	0.5 M m ³ /yr (baseline 19.7 M m ³ /yr)
Expected reduction in Provincial Wood Supply of (All Species) & [SPF only]	0.6 M m ³ /yr (-2%) [-3%]	4.5 M m ³ /yr (-16%) [-21%] * ^{-21% of entire province's wood supply. Conservative}	3.4 M m ³ /yr (-12%) [-14%]

Impact Assessment – Steps

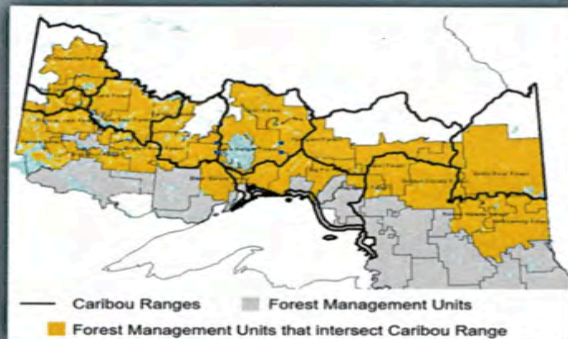
1. Determine wood supply change across the 20 FMU's in caribou habitat ranges.
2. Establish wood supply required for each mill (a “baseline industry wood requirement”):
(aggregate **20M m3/yr merchantable volume**)
3. Assess potential wood supply impacts on every mill (simulation model)
4. Assess broad social and economic impacts at a regional level (SEIM)
5. Involve Ministry of Finance (MOF) to validate SEIM results

Volumetric Change in Wood Supply

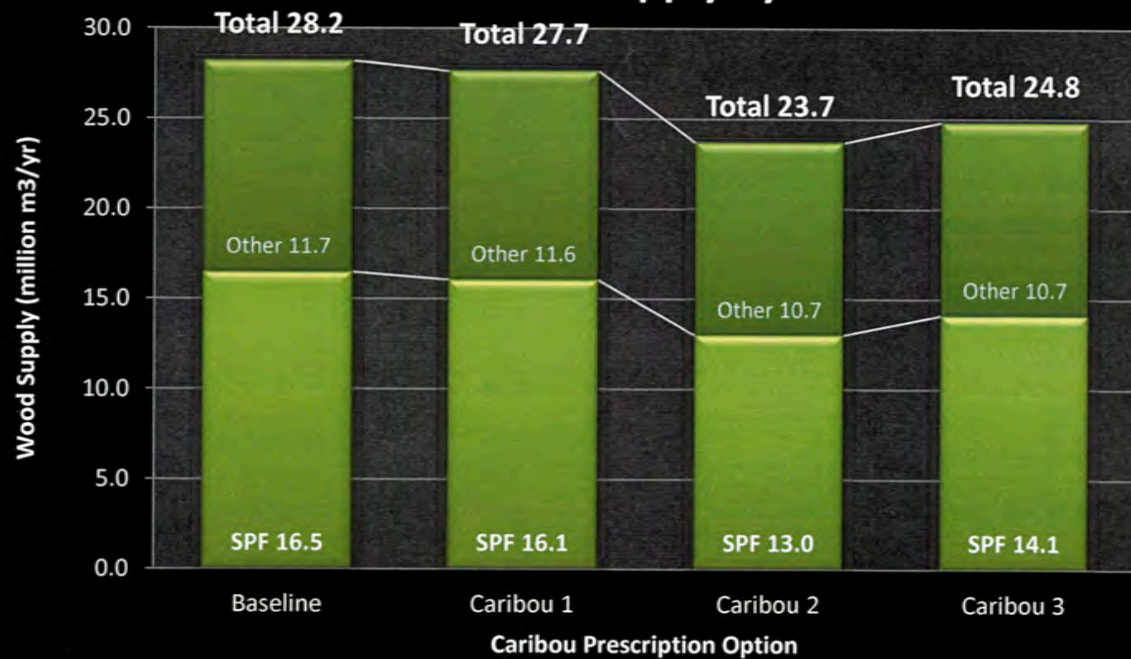
- Supply reductions were applied to current forecasted volume estimates from approved forest management plans (FMPs)¹.
- Shows the net effect of applying the reductions to FMUs in the caribou range.
- Timing of impacts will depend on how fast policy is implemented in FMPs.
- SPF supply change is greater than total volume change - SPF is the critical indicator of impacts to industry.

Percent Change in Volume

Scenario	SPF	Total
All FMU's (Province)		
Caribou 1	-3%	-2%
Caribou 2	-21%	-16%
Caribou 3	-14%	-12%



Provincial Wood Supply by Scenario

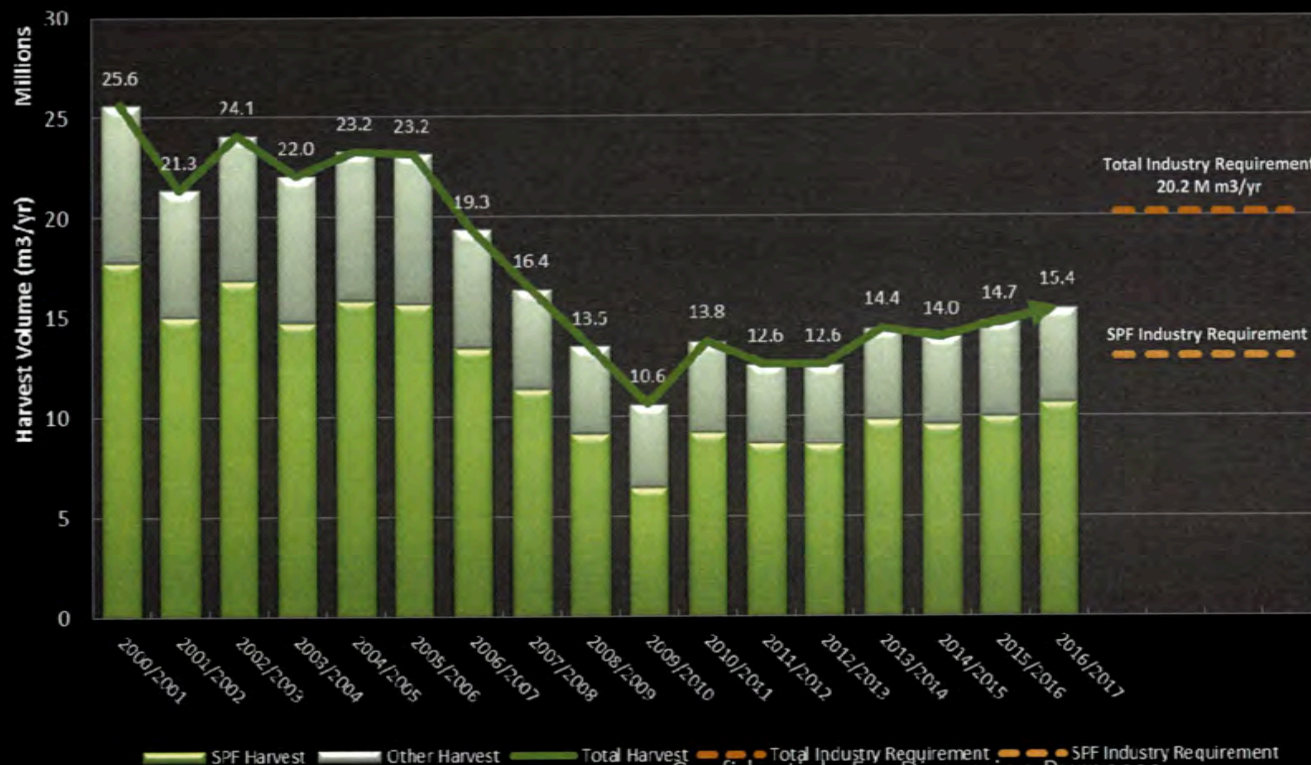


¹ Refer to Appendix 1 for overview of modelling process

20M m3/yr Industry Wood Supply Requirement

- The baseline industrial wood supply requirement is based on a facility by facility review process involving the forest industry
- The existing industry baseline supply is 20M m3/yr. total volume and 13.0M m3/yr. SPF; this takes into account past utilization, installed capacity, business plans, wood supply commitments by the province, business arrangements, etc.

Provincial Harvest Levels

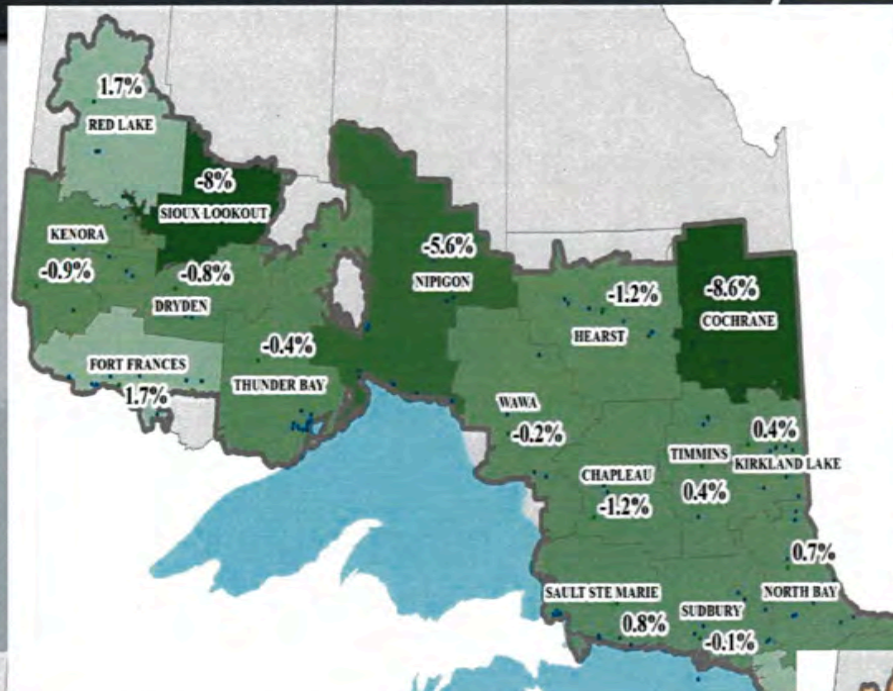


Steady recovery in harvest since low point in 2009/10, increasing production expected to continue.

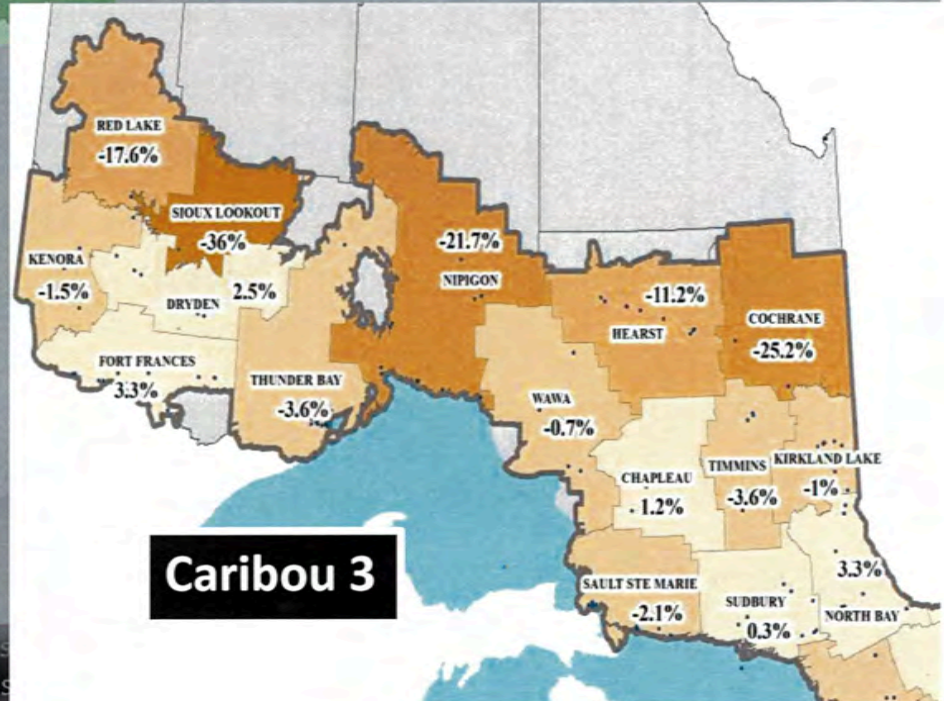
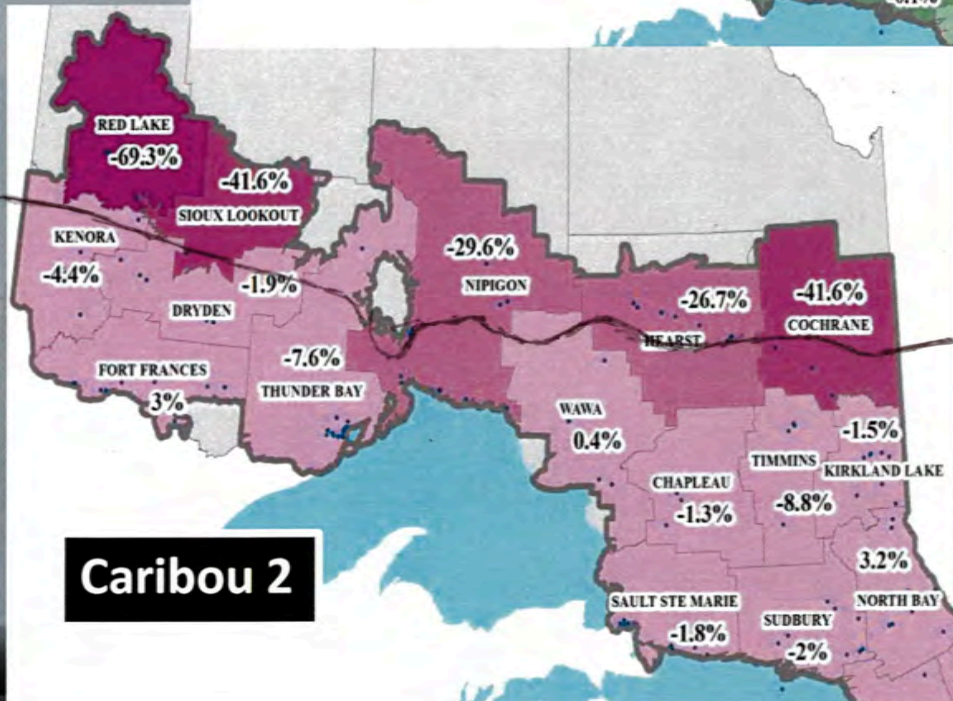


SPF volume (sawlogs) is limiting factor in analysis. 87 % of baseline SPF industry requirement was utilized in 2016/17 (76% for all species)

Reduction in Forestry Economic Activities



Social and economic impacts are based on changes in: total wood supply, affecting wood harvested and processed by primary and secondary processing facilities, which generate jobs, wages, incomes, taxes, revenues & spending power/indirect economy.



Industry Wood Supply Factors

- Not all wood supply volume is equal, useable or available to mills.
- SPF is the critical indicator of forest industry impacts because:
 1. Limited supply of sawlogs – size/quality matters for sawmills --> products.
 2. Distance to economic SPF supplies for all mills (cost) – some wood supplies are too far and too expensive. **Location! Location! Location!**
 3. Dependence of pulp mills on SPF sawmill chip supply.
 4. Dependence of sawmills on pulp mills to buy sawmill chips.
 5. Harvest operations costs (tree size, terrain, roads, water crossings, stand productivity (# of trees or volume per hectare), soils, type of equipment).
 6. Summer vs winter wood – majority of northern forests are winter wood – which is why the most wood every year is harvested during winter months.
 7. In mixedwood forests – there must be an economic market for the hardwood to harvest the SPF – managing other tree species matters.
 8. Tenure matters when there are shortages of wood supply and tenure (i.e. wood rights) are not equal among mills.

SPF Sawmill Investments last 5 years

- Industry has made large investments – some supported by government funding.
- Some have **significant Indigenous involvement/partnerships/business arrangements/economic benefits.**
- Many sawmills are in ramp up mode and need to consume more wood to realize investments during last 5 years.

Over \$190 M invested
in SPF sawmills only in
last 5 years

Another \$200 M
planned – some
part of JPF/FGF
Program

Limitations on Analysis

- No engagement with Forest Industry to confirm and verify model assumptions and results. Important assumptions have not been validated including:
 - Average haul time budgets and transportation considerations
 - Product proportions (i.e. saw log vs. pulp log specs)
 - Harvest area utilization constraints
- Analysis is limited to caribou prescriptions and forestry as opposed to the cumulative impact of other threatened/endangered species and activities (e.g. mining)
- Individual impacts will vary with each company's business decisions
- SEIM is a static analysis and contains no adjustment for prices, technology, or industrial composition. It also assumes that there is no limitation on productive capacity.
- Considerations beyond reduction in harvest and mill consumption not quantified in model including:
 - Potential negative reactions from communities whose mill may curtail or cease operations
 - Reaction from Indigenous communities whose proposals to assume SFLs and/or to establish new mills may be impaired by reductions in wood supply
 - Loss of resiliency of mills – impairs ability to withstand other pressures such as SWL duties

Appendix 1

Supplemental Information

Overview of Wood Supply Modelling Approach

Baseline

- Current approved forest management plans, with the addition of BLG Boreal Landscape Guide (BLG) targets and milestones for forest composition and structure, no pattern requirements applied

Options

- BLG targets and milestones
 - Mandatory to achieve caribou habitat
 - Flexibility in forest composition and structure (in favour of caribou habitat)
 - No pattern requirements applied (post-analysis inspection of future landscape pattern currently being assessed)
 - Dynamic caribou habitat schedules (DCHS) were incorporated, spatial model used to assign harvest areas.
- Disturbance
 - Applied at the management unit scale (not just the caribou range).
 - Anthropogenic disturbance (other than harvest and forestry roads) remains at current levels, 500m buffer applied.
 - Assumed no additional natural disturbance (e.g., fire) occurred on the management units
 - Naturally disturbed areas and forestry operational roads not considered disturbance after 35 years of age

Wood Flow Simulation Modelling Process

- A baseline scenario was developed and results for each mill were reviewed to confirm baseline assumptions for facilities
 - The baseline scenario **projects wood use at approximately 20 million m³** based on a variety of factors (see next slide)
 - The baseline scenario did not project wood supply use for the Fort Frances pulp mill
 - Volumes were adjusted for the Whiskey Jack, Whitefeather, and Big Pic Forests
- After each Caribou prescription scenario, individual mill results were reviewed again relative to the baseline scenario.
- Each mill is evaluated based on changes in wood supply and transportation cost relative to the baseline scenario.
 - Mills with extreme changes in supply and/or costs were deemed 'closed' and removed from the model, the model was then re-solved to reach a new equilibrium.
 - Re-solving the model after removing mills has a general moderating impact on the total amount of economic activity as near-by mills take advantage of newly available wood supply.
- Process is repeated until no further mills are deemed 'closed'
- Final model results are aggregated and exported for use in SEIM



SEIM Analysis

- The Socio-Economic Impact Model (SEIM) is a tool that was developed specifically for MNR to predict and compare the direct, indirect, and induced impacts of a forest sector activity on economic and social indicators at the district, regional, and provincial levels. It is widely used within forest management planning, among other purposes.
- SEIM uses 2011 input-output tables from statistics Canada. Inflation rates derived from provincial GDP deflator has been used to deflate the 2016-17 prices to 2011 level, and to reflate the output to 2017 dollars.
- Inputs for the analysis come from several sources:
 - Operations Branch – Wood usage data
 - Forest Tenure and Economics Branch – Commodity prices and conversion factors
 - KPMG survey– Harvest costs for hardwood timber and softwood timber
 - Ontario Ministry of Finance – GDP deflator
 - Wood Pellet Association of Canada – Wood pellet prices
- Analysis focusses exclusively on the impacts on employment, GDP and tax revenue in three different Caribou scenario relative to baseline. No other socio-economic indicators were analyzed.
- Results are based only on the output loss of five primary industries (Logging, Sawmills, Pulp & Paper, Veneer & Composites, and Wood pellets) and associated supply chain of these industries.
- Induced impacts, arising from change in household income, have not been considered.
- SEIM results for job and GDP impacts have been validated by Ontario Ministry of Finance input-output model.