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DELIVERED LOG COST GUIDE

INTRODUCTION:

The Deh Cho Land Use Planning Committee (DCLUPC) wished to determine logging cost parameters on a Deh Cho territory-wide basis. Figures and data were used from a report to identify merchantable stands of sawlog timber and their geographic area prepared for the Deh Cho Land Use Planning Committee by PACTeam Canada, 2003. The PACTeam Canada report is titled "A spatial analysis and literature review of timber potential in the Deh Cho Territory, NWT".

The figures 4-6, and 9 attached are from said report.

1. VOLUME PER HECTARE CALCULATION:

The PACTeam Canada report classified sawlog quality stands of timber, comprised of conifer (white spruce and pine) and aspen. The conifer class contains mostly white spruce. Figure 9 from this report, "Areas with the potential to supply timber (sawlogs) in the Deh Cho territory", identified 5 potential sawlog categories, namely,

- None
- Low
- Moderate
- High
- Very high

1.1 Very High Sawlog Timber Category:

The "Very High" category has good quality spruce and aspen. Most of this timber is almost exclusively in and about the communities of Ft Liard and Nahanni Butte, in the Liard River valley and its large tributaries, such as the Muskeg River and Petitot River. There are isolated areas of conifer sawlog stands around Jean Marie River and along the Mackenzie River (e.g.; Camsell Bend) and its islands. South of Kakisa, there is an area of "Very High" in the Cameron Hills along its east face (only, the north face is "High").

In order to quantify the area occupied by sawlog stands, DCLUPC calculated the gross area of the spatial inventory and the area occupied by "Possible white spruce saw log stands in the spatial inventory areas", "Possible pine saw log stands in the

spatial inventory areas” and “Possible aspen sawlog stands in the spatial inventory areas” in Ft Liard and the Cameron Hills spatial inventories (Figures 4, 5, & 6). The result was presented as a percent coverage:

- Very High Ft Liard: Conifer-26%. Aspen-17%
- Very High Cameron Hills: Conifer-21%. Aspen-10%

The conifer and aspen volume per hectare of the Ft Liard and Cameron Hills stands is approximately 350 m³. The sawlog quality volume over the landscape would then be 350 m³/ha X % coverage:

- Very High Ft Liard: Conifer-90 m³/ha. Aspen-60 m³/ha
- Very High Cameron Hills: Conifer-70 m³/ha. Aspen-35 m³/ha.

An average number to use across the “Very High” conifer sawlog quality stands outside Ft Liard and Cameron Hills is suggested to be 70 m³/ha. No aspen was classified outside Ft Liard and Cameron Hills spatial inventories in the PACTeam Canada report.

1.2 High Sawlog Timber Category:

Similar to the “Very High” category, the area occupied by sawlog stands was quantified as a percent (Figures 4, 5, & 6). The coverage of “High” was calculated using the Ft Liard, Ft Providence, and Cameron Hills spatial inventories. Note aspen sawlog quality stands were not considered to be sawlog quality by the PACTeam Canada report in the Ft Providence inventory.

- High Ft Liard: Conifer-4%. Aspen-2%
- High Ft Providence & Cameron Hills: Conifer-3%. Aspen (Cameron Hills only) -3%

The conifer and aspen volume per hectare of the “High” sawlog category would optimistically be in the order of 250 m³/ha. The sawlog quality volume over the landscape would then be 250 m³/ha X % coverage:

- High: Conifer-7.5 m³/ha. Aspen-5 m³/ha

While these values of volume per hectare in the “High” category may seem to be very low, it should be recognized the change from the “Very High” to “High” category corresponds to a very significant reduction in productive land conducive to producing sawlog quality timber. Drainage (i.e.; from well drained to poorly drained ground) and aspect (i.e.; north-facing areas are cold, often with permafrost) are key physical features affecting sawlog production in the NWT. In the poorly drained landscapes

that are very common to the Deh Cho Territory, sawlog timber only grows on well-drained sites such as eskers, river terraces or islands, ridges, or on gravel deposits.

For this reason the stands of sawlog timber are dispersed over the landscape or along rivers surrounded by a large expanse of swamps and black spruce stands. Furthermore these sawlog quality stands are usually small in area, commonly less than 30 hectares, but more often less than 10 hectares. When this feature is combined with Regulatory requirements, these stands commonly represent a volume of only 2000-5000 m³ per stand. This factor has a significant effect on delivered costs.

The database calculated sawlog quality stands that currently occupy the Deh Cho Territory, not its productive forest land. Spruce budworm infestations alone are *annually* significantly reducing the merchantability of the white spruce stands. Wildfire too significantly reduces the area of sawlog timber across the landscape in all of the Deh Cho, and can change the potential sawlog stands to firewood literally overnight.

1.3 Moderate and Low Sawlog Timber Category:

In the opinion of the author, only the “High” and “Very high” categories have any realistic sawlog timber value that is economically or environmentally acceptable to harvest. The “Moderate” and “Low” category is economically marginal and very dependent upon access and wood quality and quantity. Due to the landscape level of information presented in this sawlog timber classification, there are likely numerous isolated sawlog stands of good quality along existing Highway access that would fall into the “High” category that this study does not identify.

1.4 Summary of volume per hectare calculation over the gross area:

- Very High Ft Liard: Conifer-90 m³/ha. Aspen-60 m³/ha
- Very High Cameron Hills: Conifer-70 m³/ha. Aspen-35 m³/ha.
- Very High elsewhere: Conifer-70 m³/ha. No aspen identified.
- High Deh Cho 350 m³/ha X % coverage: Conifer-7.5 m³/ha. Aspen-5 m³/ha

The “Moderate” and “Low” category is economically marginal and very dependent upon access and wood quality and quantity.

2. LOGGING COSTS:

Logging costs are highly dependent upon access, volume per hectare and quantity. These costs can be broken down into three components; namely,

- Road development costs to access the wood
- Loaded-on-truck costs (of falling, skidding the wood to the manufacturing and loading site, manufacturing the trees to the desired product to load, loading, and post-harvest clean-up (e.g.; road de-activation and logging waste disposal).
- Government royalties (roughly \$5-7.00/m³ for spruce, depending upon numerous regulated factors, including scaling the wood for official records). Aspen royalty is significantly cheaper than conifer because there is no reforestation cost.

Except for royalties, the assumptions made for these costs are framed within the context of harvesting within the NWT generally. The assumptions made in the calculation of logging costs are:

- A quantity of wood of per harvesting unit of only 2000 m³ (roughly 10 hectares of a productive stand of trees).
- Development of 5 km of road and “on-site” roads and landings (manufacturing sites).
- Hand falling, line skidder, and hand bucking (manufacturing) to tree length (to minimum top diameter of 15 cm).
- Winter logging (significantly cheaper development costs in the winter).
- Self-loading truck 5 axle (picker truck), NWT weight regulations.
- Small 2-man crew.
- 1 hour drive from town.
- Locally available equipment to mobilize and de-mobilize from the local community to the logging site.

2.1 Road Development Costs:

The average development cost is valued at \$5.00/m³.

2.2 Loaded-on-truck Costs:

The average loaded-on-truck cost is valued at \$25.00/m³. The “Very High” conifer and aspen sawlog quality category in Ft Liard is unique and likely has loaded-on-truck costs \$5.00/m³ cheaper than the rest of the NWT. Ft Liard has high volume per hectare, stands greater than 30 hectare plus in size, and experienced contractors available with mechanized equipment from Ft Nelson.

3 LOG HAULING COST:

Hauling is between 25 and 50% of the delivered wood cost. In the NWT context hauling cost is the critical “go-no go” economic decision, because of long distances to the market, especially to an export market to BC or Alberta.

To assist the domestic market, the hauling cost was based upon geographic regions per Figure A. The average distance for each domestic region was calculated by measuring the distance to the nearest community from the sawlog quality stands rated as “High” and “Very High” (Figure 9). These haul distances and costs are estimated as follows:

Wrigley: 75 km // \$6.15/m³ spruce. No aspen cost.

Ft Liard, Ft Simpson, Trout Lake, Ft Providence: 50 km // \$5.04/m³ spruce// \$ 6.70/m³ aspen.

Horn Plateau: No wood

Fish Lake: No wood

Mackenzie Mountains: No wood

The wood from Cameron Hills and Ft Liard has unique opportunities due to their proximity to the High Level, Alberta, and Ft Nelson, BC log markets respectively. These opportunities are two fold:

- Both conifer and aspen sawlogs are utilized by these manufacturing centers.
- Haul distance is relatively short to these manufacturing centers. (200 km highway haul).

Haul costs for Cameron Hills and Ft Liard now become the highway haul distance plus the distance to the highway. Haul cost is estimated as:

- Ft Liard: 200 km highway + 50 km off-highway. Spruce-\$14.00/m³. Aspen-\$18.50/m³.
- Cameron Hills: 200 km highway + 30 km off-highway. Spruce-\$13.00/m³. Aspen-\$17.30/m³.

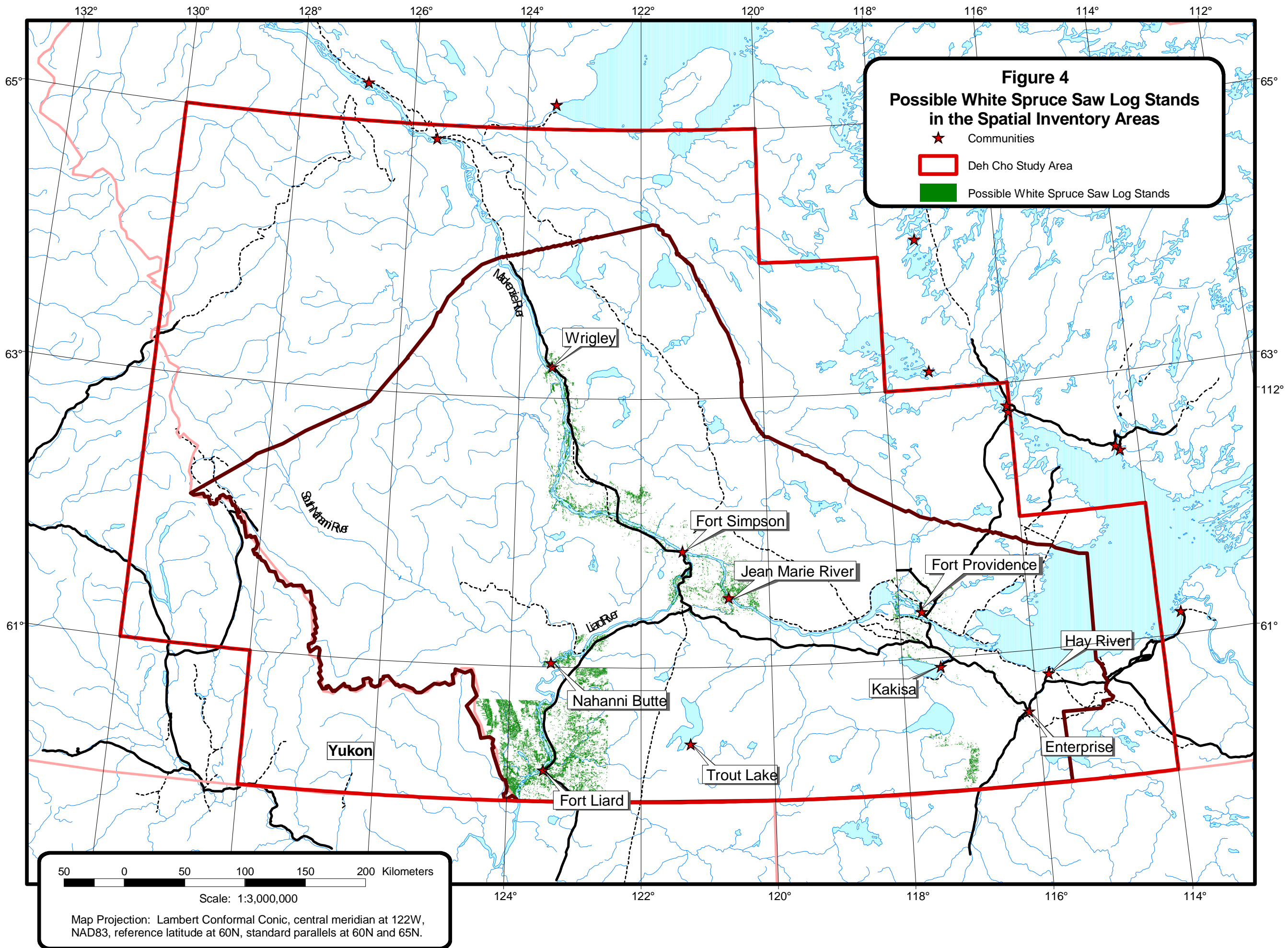
Currently prices are about \$45.00/m³ spruce and \$30.00 for aspen delivered. At these haul distances, spruce can make a profit only during peak sawlog delivered prices or for peeler quality wood of about \$55/m³. Aspen cannot make a profit unless much higher prices are offered.

The exception to all of the above is the Yellowknife firewood market. Firewood delivered selling price is \$225-250/cord or \$100/m³, which is roughly double the sawlog delivered value in Ft Nelson or High Level. The loaded-on-truck cost for firewood is likely about \$5/m³ higher than tree length operations, and hauling costs are likely higher. However, the haul distance can still probably be increased to as much as 800 km and still make a profit.

4 DELIVERED WOOD PRICES:

Spruce sawlogs are about 45.00/m³ and aspen is about \$30.00/m³ delivered in High Level, Alberta and Ft Nelson, BC. Pine likely isn't purchased for as much as spruce.

Firewood in Yellowknife is about \$200-250/cord or about \$100/m³ (conversion rate of 2.27 m³/cord).



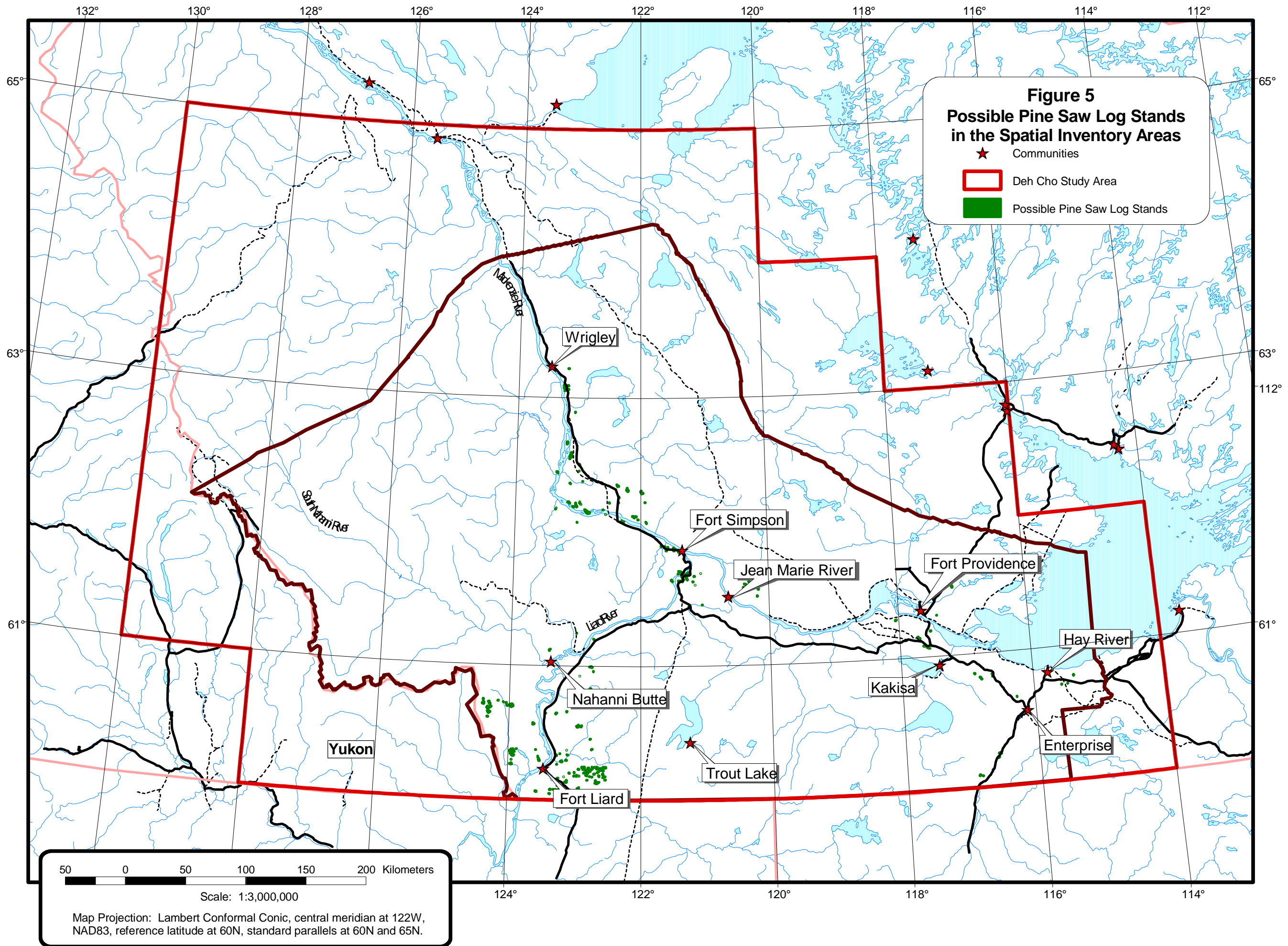
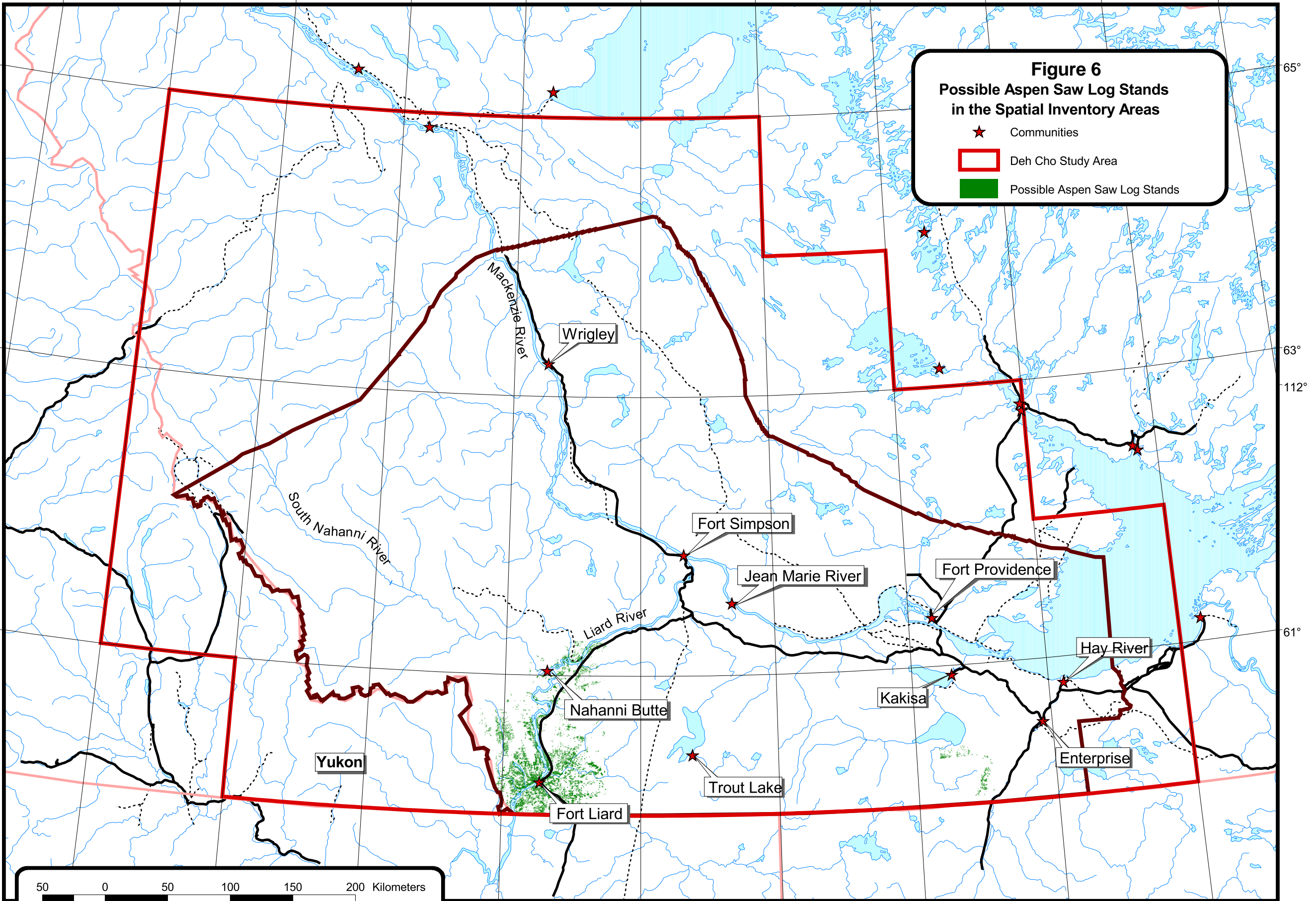


Figure 6
Possible Aspen Saw Log Stands
in the Spatial Inventory Areas

- ★ Communities
- ▭ Deh Cho Study Area
- ▭ Possible Aspen Saw Log Stands



50 0 50 100 150 200 Kilometers

Scale: 1:3,000,000

Map Projection: Lambert Conformal Conic, central meridian at 122W, NAD83, reference latitude at 60N, standard parallels at 60N and 65N.

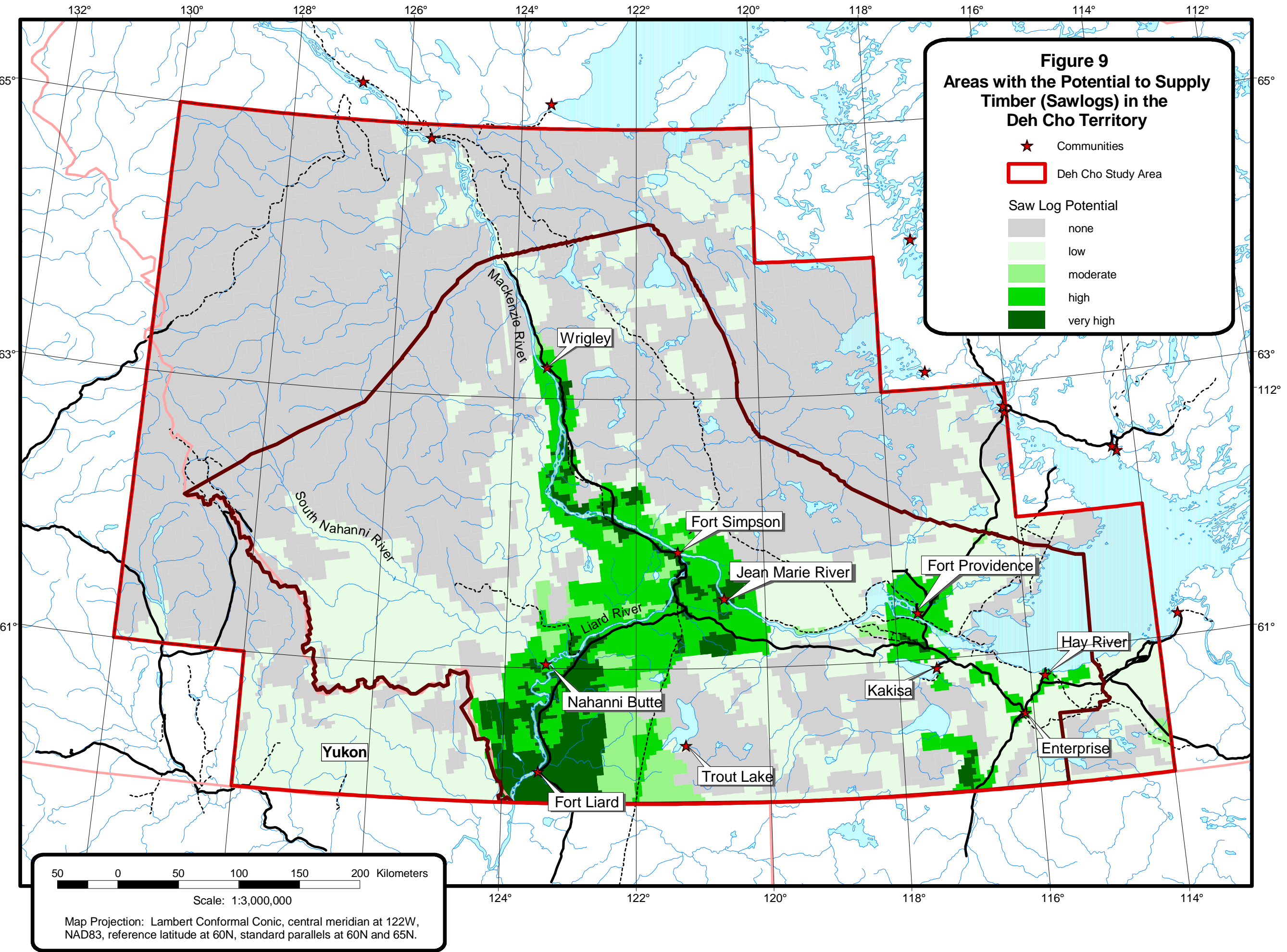


Figure 9
Areas with the Potential to Supply
Timber (Sawlogs) in the
Deh Cho Territory

- ★ Communities
- ▭ Deh Cho Study Area

Saw Log Potential

- none
- low
- moderate
- high
- very high

50 0 50 100 150 200 Kilometers
 Scale: 1:3,000,000
 Map Projection: Lambert Conformal Conic, central meridian at 122W,
 NAD83, reference latitude at 60N, standard parallels at 60N and 65N.

Figure A - Geographic Regions used in Delivered Log Cost Guide

