# PULP WOOD POTENTIAL

*Stemwood smaller than saw timber has traditionally been harvested and allocated for the use of pulp and paper industries. In recent years, due to fluctuations in industrial production capacity and wood markets in general, a share of this pulpwood-sized stemwood has also been used in energy production. Some biorefining processes require stemwood as a raw material, since it has the least of extractives and impurities of all the tree biomass components. Pulpwood can be obtained from all commercial harvestings, from first thinnings to final fellings. There is a growth surplus of pulpwood in Finland, so the full harvesting potential is currently not fully utilized.*

## HARVESTING OF PULP WOOD

Pulpwood is commonly described as stemwood that has diameter limits ranging from 12-18 to 5-7 cm, and is traditionally used in pulp and paper industries. Stemwood logs with larger dimension usually have much higher value and multiple uses in timber industry. Due to its considerably lower price compared to saw timber, pulpwood-sized stemwood could be considered as a raw material source for some biorefining processes.

The national roundwood harvesting levels fluctuate from year to year. Harvested roundwood volume ranged from 41 to 57 million $m^3$ during the years 2002-2011 with an average of 52 million $m^3$. Based on a ten-year average roundwood harvesting level (2002-2011), pulpwood harvesting volume was 30.1 million $m^3$ per year. Pulpwood-sized pine stemwood consisted of 13.7 million $m^3$ per year of the total volume. Respective harvesting volume of spruce was 8.4 million $m^3$ and broadleaf species 8.0 million $m^3$.

## PULPWOOD POTENTIAL

A long-term trend has been that the roundwood harvestings are well below the annual volume growth of the forest reserves. The full harvestable potential of pulpwood was estimated on the basis of harvesting suggestions of the $10^{th}$ national forest inventory (NFI). Based on this estimation, the harvesting potential of pulpwood-sized stemwood is 37.6 million $m^3$ per year in Finland. 14.7 million $m^3$ consists of pine, 11.9 million $m^3$ of spruce and 10.9 million $m^3$ of broadleaves (82 % birches).

Compared to the harvesting potential based on the $10^{th}$ NFI, the average pulpwood harvesting volume was 7.5 million $m^3$ below the full potential in the whole country. Most of this surplus consists of spruce and broadleaves, while pine pulpwood harvestings were already close to the potential. However, there are significant changes in harvested pulpwood volumes between individual years, hence the surplus volume could be much larger or smaller in some years.

## GEOGRAPHICAL DISTRIBUTION OF PULP WOOD

Pulpwood harvestings of Scots pine and broadleaves are emphasized in the north-western and south-eastern parts of the country, while spruce pulpwood harvesting is more focused in south-eastern and

southern parts. The harvesting potential according to the NFI is focused in the west and south-east for pine and broadleaves, while spruce is also focused in the southern and southwestern parts of Finland. It should be noted that the regional variability in annual harvestings can be large, hence the harvested volumes in some regions can well exceed the estimated potential for the same area.

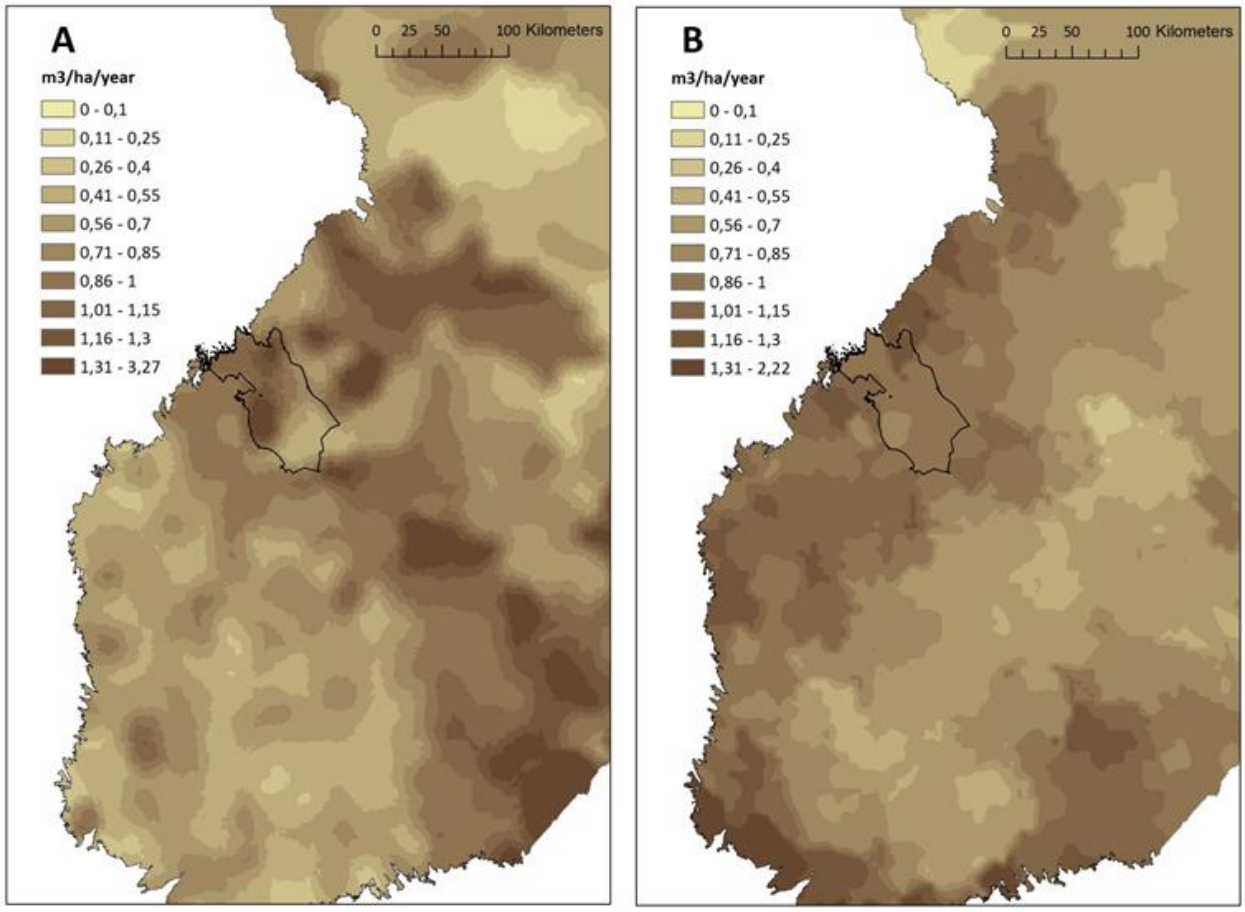


**Figure 1.** [A]: Volume (per hectare of forest land per year) of harvested Scots pine pulpwood from all felling types based on average harvesting level of 2002-2011; [B]: Potential of pine pulpwood estimated from the 10$^{th}$ NFI; Total pine pulpwood volumes in the province of Central Ostrobothnia (outlined in the maps): 332 000 m$^3$ in [A] and 320 000 m$^3$ in [B]. Harvesting statistics [A]: Metla/MetINFO.

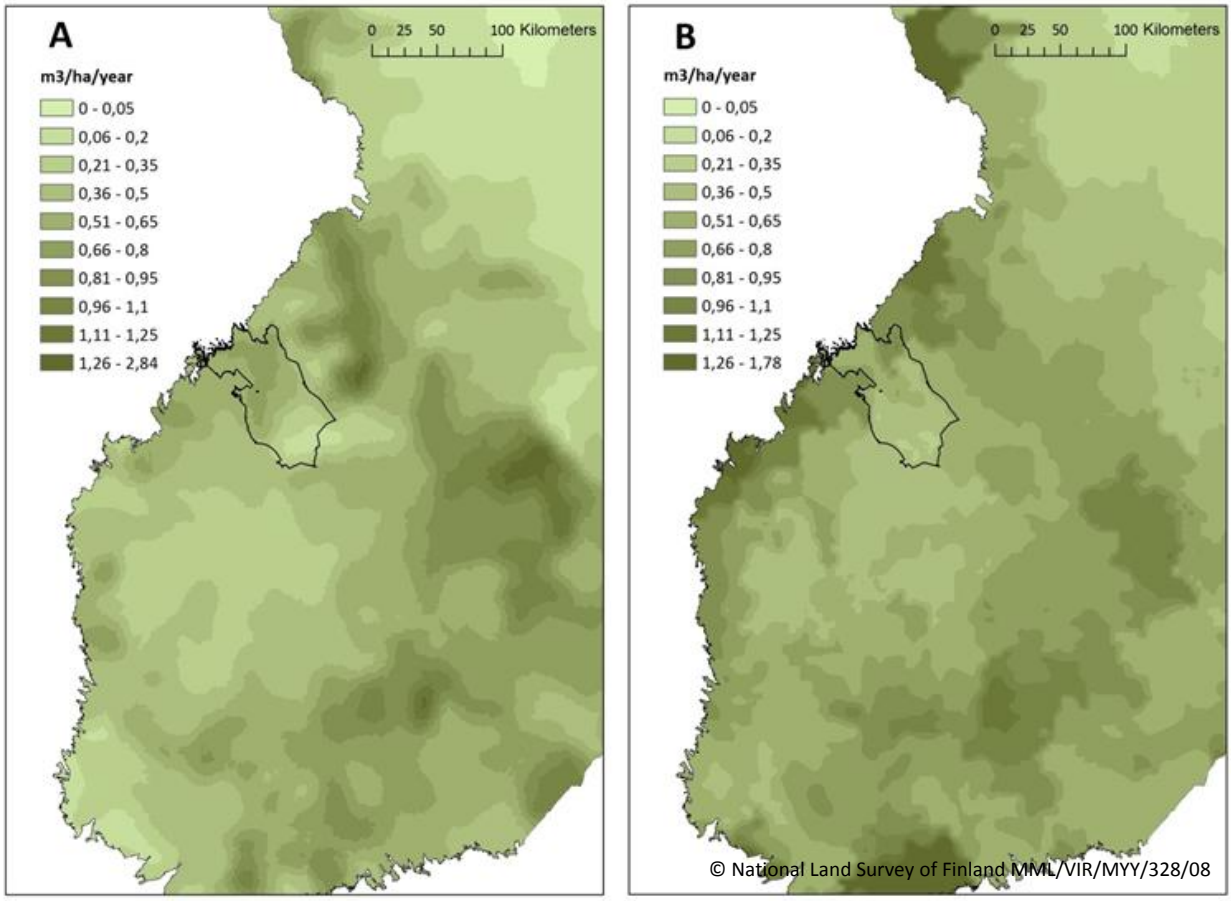


**Figure 2.** [A]: Volume (per hectare of forest land per year) of harvested broadleaf (mainly birches) pulpwood from all felling types based on average harvesting level of 2002-2011; [B]: Potential of broadleaf pulpwood estimated from the 10$^{th}$ NFI; Total broadleaf pulpwood volumes in the province of Central Ostrobothnia (outlined in the maps): 176 000 m$^3$ in [A] and 181 000 m$^3$ in [B]. Harvesting statistics [A]: Metla/MetINFO.

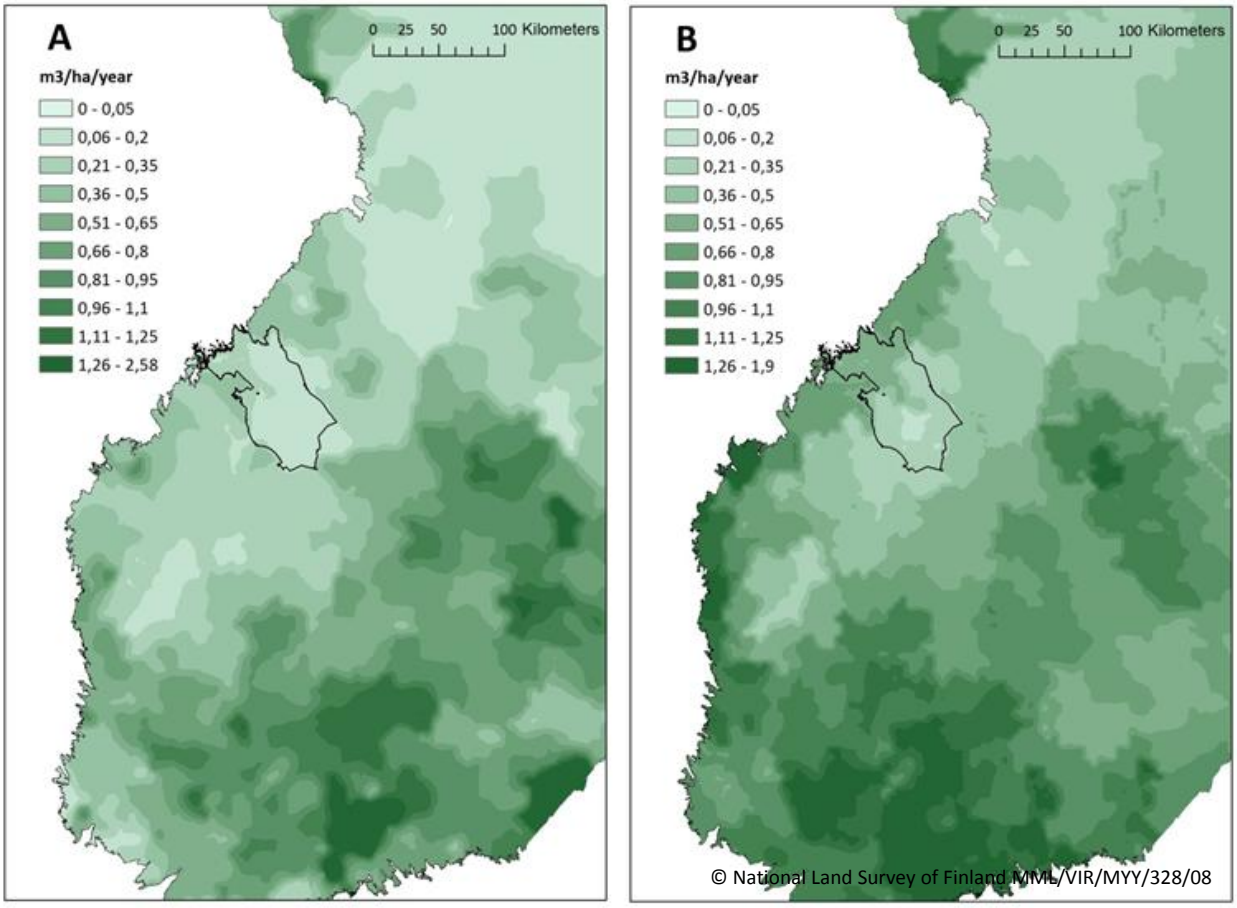


**Figure 3.** [A]: Volume (per hectare of forest land per year) of harvested Norway spruce pulpwood from all felling types based on average harvesting level of 2002-2011; [B]: Potential of spruce pulpwood estimated from the 10$^{th}$ NFI; Total spruce pulpwood volumes in the province of Central Ostrobothnia (outlined in the maps): 48 000 m$^3$ in [A] and 123 000 m$^3$ in [B]. Harvesting statistics [A]: Metla/MetINFO.

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