



Market analysis

Availability of forest products and by-products

North-West USA

Client:

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1. Introduction

SGS has been assigned by Electrabel to analyse the market availability of the feedstock used to produce wood pellets in North-West USA, in order to assess to what extent the use of those materials for energy purpose might compete with the industrial use of those resources both locally and internationally.

This report will cover the following wood resources used as raw material by pellet producers in North-West USA:

- Residues of forest exploitation
- Round from forest thinning & harvesting
- Wood processing residues

The industrial activities concerned by those materials are:

- sawmills
- pulp and paper
- wood panels production

The geographic range covered by the analysis includes the most significant forested states in the North-West: Washington, Oregon, Montana and Idaho.

2. Production volumes

According to the most recent statistics available from the FAO to data¹ (Figure 1) the production of round wood in the US in 2012 was 361 million m³. It shows a slight increase since 2010 after radical decrease of about 30% experienced between 2005 and 2010. The current production levels are still far below the production levels of 2005 (467 million m³).

The decrease of the production levels between 2005 and 2010 was triggered by the subprime mortgage crisis, which led to a fall of the demand for timber products as building materials. This situation was subsequently aggravated by the propagation of the financial crisis to other sectors of the economy, resulting in a lower demand for various wood products. As a result, many-wood based industries in the US went bankrupt between 2005 and 2010, leading to a reduced demand for wood raw materials and reduced production levels, associated with a diminution in the volumes of harvested wood. As can be seen on Figure 2, the production of chips and particles, pulp for paper, sawnwood and wood-based panels has also been decreasing in the USA after 2005, following a similar trend as the round wood production.

¹ http://faostat3.fao.org/faostat-gateway/go/to/browse/F/*E

The same trend affected all regions of the USA, as can be seen in the statistics of processed timber production per region on Figure 3 (with distinction between North, South and West regions).

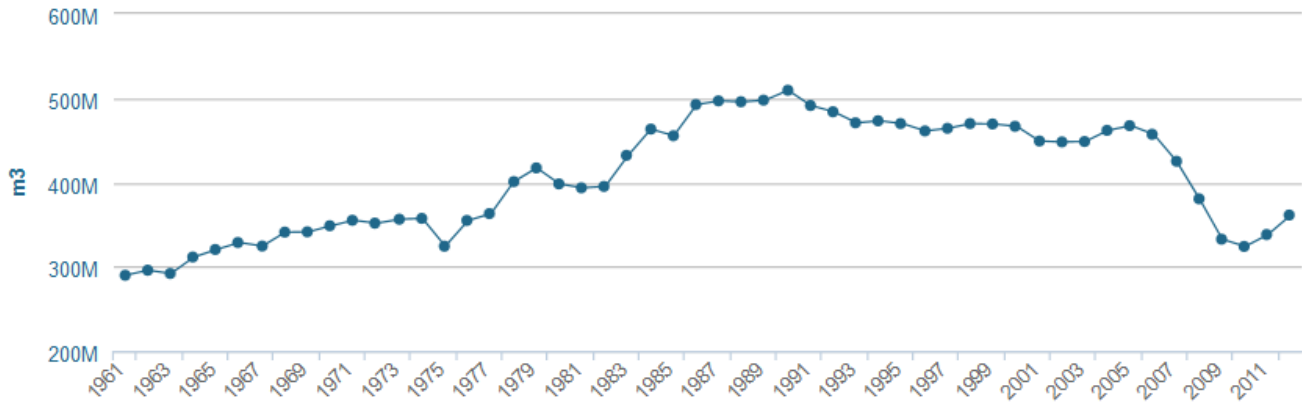


Figure 1 : round wood production (harvesting in m³) in USA between 1961 and 2012
(source: FAOstat)

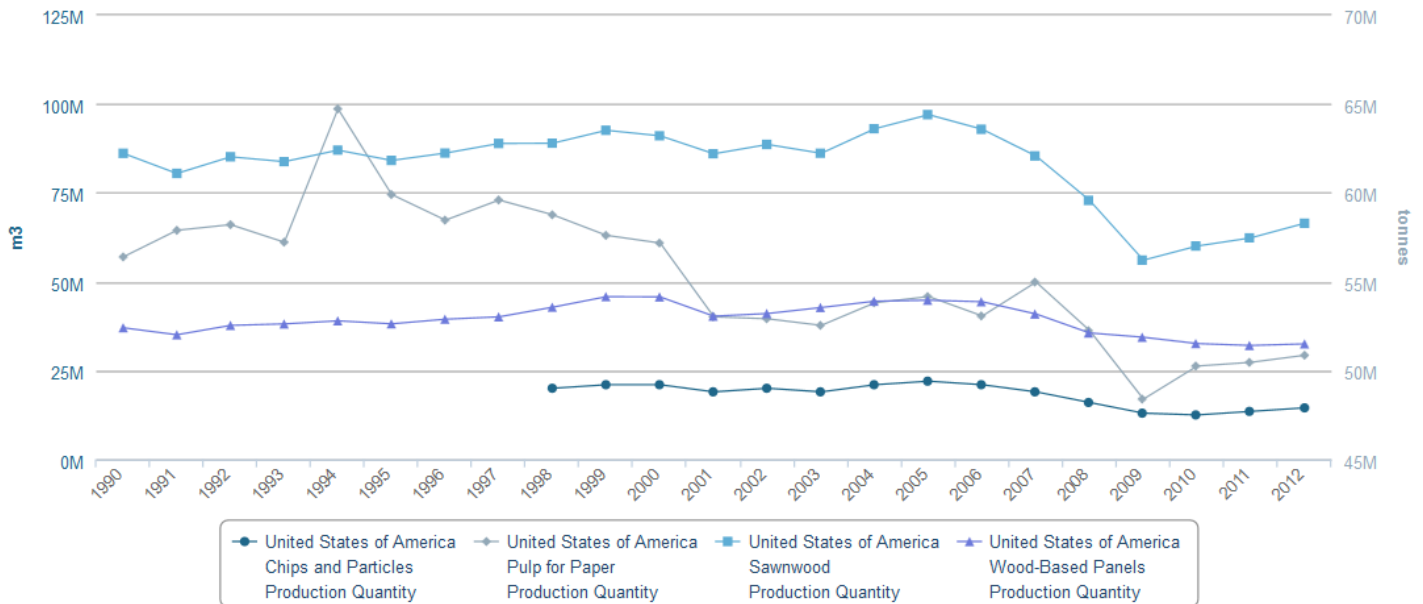


Figure 2 : production levels of chips and particles (m³), pulp for paper (tonnes), sawnwood (m³) and wood-based panels (m³) in the USA between 1990 and 2012
(source: FAOstat)

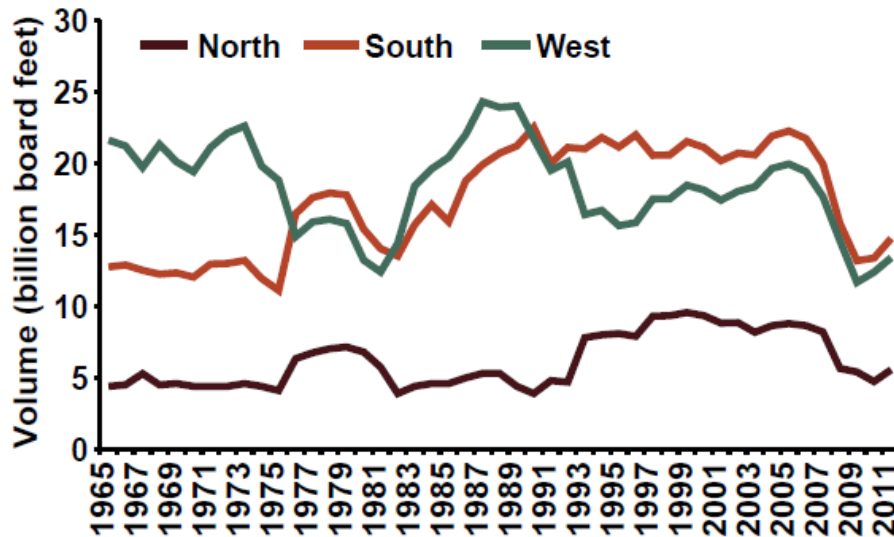


Figure 3 : evolution of processed timber production in the USA per region

source : J L Howard & R M Westby, "U.S. Timber Production, Trade, Consumption and Price Statistics 1965–2011" (USDA)

When we look more specifically at the production from the forests in the Western states, we can see that the evolution of the sawnwood production follows a quite similar trend as the trend observed at the country level. However, we can see that the collapse of harvesting levels started earlier in the North West than in the rest of the USA : as soon as the late 1990ies. This is because radical changes were introduced in the forest management policy of the National Forests, which are predominant in the North West.

The technique of clear cutting was radically limited in National Forests, in an attempt to save endangered species (in particular the Spotted owl, which has kept on disappearing despite those efforts). Between 1988 and 2004, the area harvested by clear-cutting dropped by 91 percent, from 283 000 to 19 000 acres, and clear-cutting as a percentage of all harvesting in National Forests declined from 38 percent to 7 percent annually². Since the introduction of this policy, the volumes of wood harvested from the National Forest has been reduced by more than 80% (Figure 4). Because of this policy, some wood-based industries were run out of business because of lack of raw material.

Additional mechanisms explain the drop in timber production in the US North-West since the early 1990ies³:

² Annual National Forest System Reforestation and Timber Stand Improvement Reports cited by FAO <http://www.fao.org/docrep/010/ai412e/AI412E06.htm>

³ JM Daniels, 2005, "The Rise and Fall of the Pacific Northwest Log Export Market", USDA, Pacific Northwest Research Station http://www.fs.fed.us/pnw/pubs/pnw_gtr624.pdf

- cheaper lumber (sawn wood) available from Canada was difficult to compete with (stumpage charged to logging companies for harvesting from public forests in Canada is reported to be cheaper than in the US, resulting in cheaper lumber products)
- drop of timber logs exports to Asia (especially to Japan) between the late 1980ies and 2007), where the demand for construction wood used to be a very important market for wood from the West coast of US. International competition on the Asian markets (including with cheap Canadian lumber) and subsequently reduction of the wood demand on those markets, were the drivers of this decrease . However, a more recent evolution is a spectacular rise of the timber logs exports to China (the exports from USA to China were multiplied by 10 between 2007 and 2012, most of them originating from North West USA and Alaska : see details in section 5 - Import and export of wood resources).

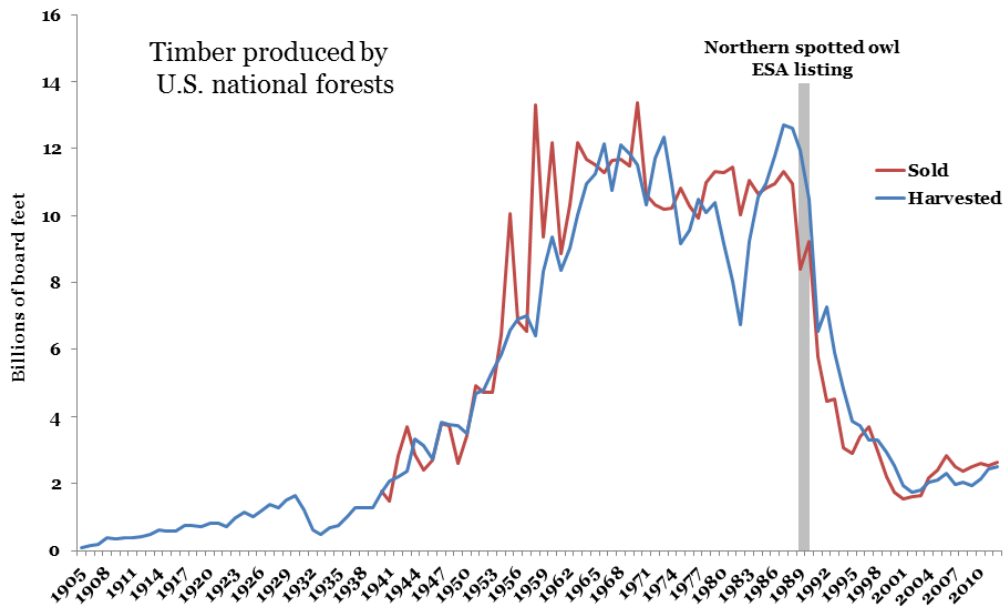


Figure 4 : Volume of wood harvested from National Forests

(source : <http://www.ecowest.org/land/forestry/>)

Even though this graph is for nationwide data, it mostly reflect the evolution in the West where National Forests are predominant, while they are insignificant in the East.

3. Forest exploitation levels

The level of forest exploitation in the USA compared with the annual growth is analysed for each individual state (see sustainability reports per state), based on USDA’s Forest Inventory and Analysis (FIA).

In the North Western states, the analysis includes the following parameters:

- recent reduction of harvesting levels, especially on National Forest lands
- detrimental effects of the recent mountain pine beetle outbreak, leading to reduced fitness and mortality
- possible additional impact of frequent wildfires in recent years
- stability or slight increase of the forest surfaces in recent years.

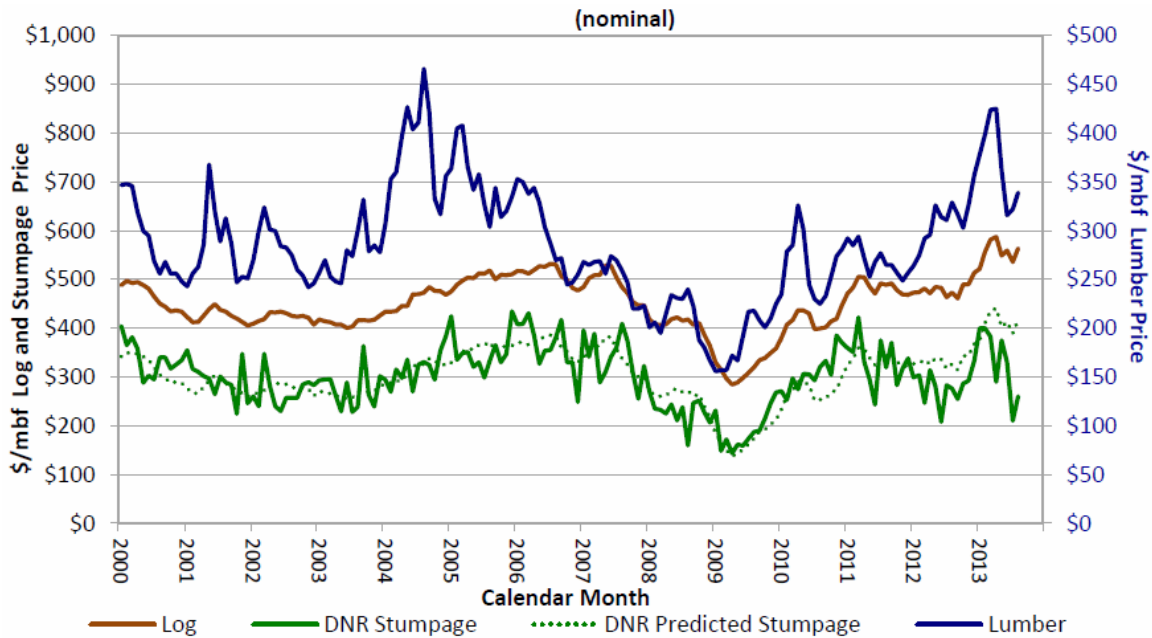
As a result the balance between growth and removal is as follows:

- slight but consistent decrease of the volume of life trees in Montana
- slight increase of the volume of life trees in Idaho.

The other states of US North West (Oregon and Washington) have not been covered by the sustainability analysis at this stage.

4. Price of wood resources

As can be seen on Figure 5, the prices of sawnwood in Northern USA have significantly decreased during the period 2005-2009, reflecting the continuous decrease of the domestic demand for building materials. Unlike in the South-East, the prices of sawnwood have quickly recovered, boosted by the price of roundwood which has been increasing because of the exploding exports to China, and by the scarcity of large diameter round wood on the domestic market, resulting in expensive timber sourcing for the sawmills. Because of the high timber prices associated with the boom of the exports to China, sawmills have been struggling to source enough round wood, the production output have been decreasing and the price of the sawnwood has been increasing.



Note: The two scales reflect the fact that, on average, one Board foot Scribner log scale yields about two board feet lumber scale

Figure 5 : Lumber prices in the state of Washington (reflecting the evolution in North West USA), 2000-2014

(source : Washington State Department of Natural Resources (DNR) Economic and Revenue Forecast, September 2013.)

During the same period the prices of pulpwood in the North West have been rather constant and don't show the impact of the economic recession after 2005 (Figure 5). The prices of sawmill residues have, to some extent, followed the increase of the prices of timber logs and sawnwood during the period 2007-2010 (Figure 6).

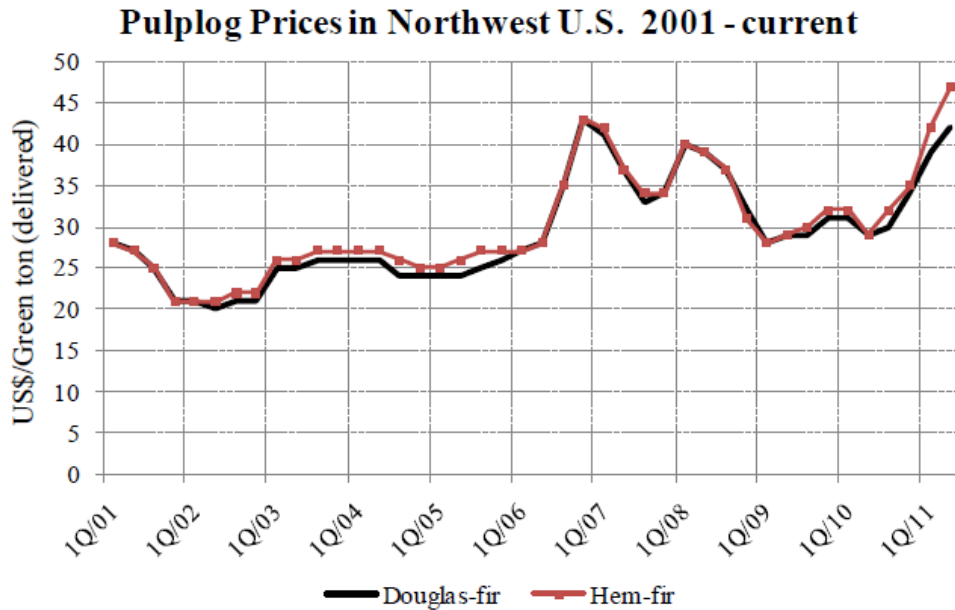


Figure 6 : Pulpwood prices in North West USA, 2001-2011
(source : North American Wood Fiber Review, June 2011)

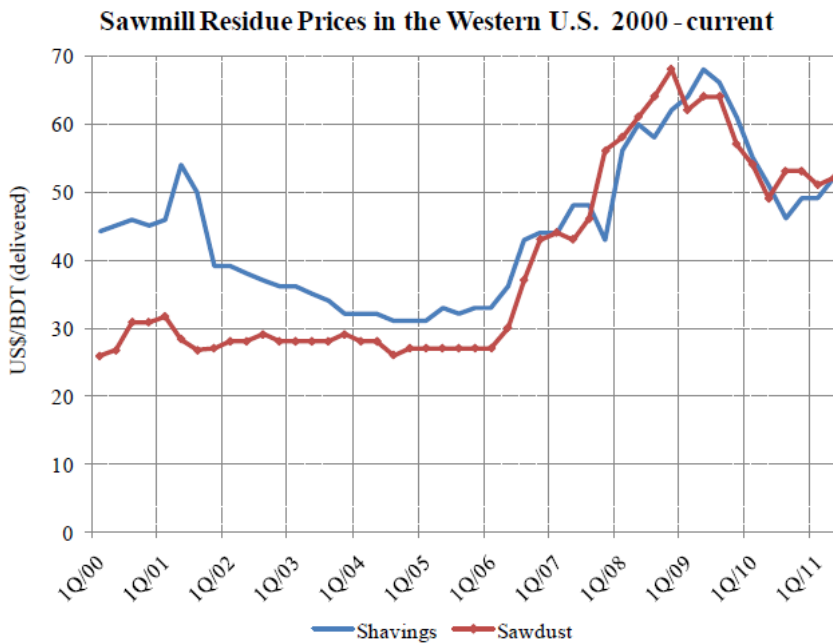


Figure 7 : Sawmill residues prices in North West USA, 2001-2011
(source : North American Wood Fiber Review, June 2011)

5. Import and export of wood resources

In this section, imports and exports are taken into account to assess the availability of the different kind of materials.

While the imports and exports of round wood to/from the USA remains negligible compared to the domestic production, it is noticeable that the imports have clearly decreased and the exports slightly increased since 2005, while domestic demand was falling (Figure 8). The increase of the round wood exports is mainly related to the evolution of the exports to China.

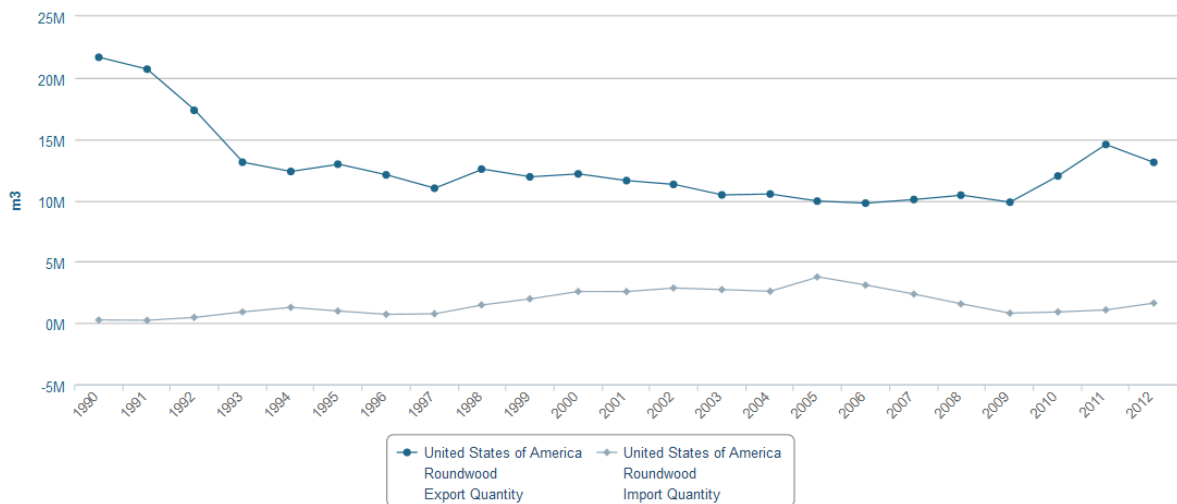


Figure 8 : imports and exports of round wood in the USA between 1990 and 2012 (source : FAOstat)

The exports of pulp for paper have significantly increased in recent year, while the production was decreasing, suggesting that an excess of material was available on the domestic market when several paper mills were run out of business (Figure 9). The pulp exports which used to be only 5.57 million tons back in 2005, increased to 8.32 million tons in 2011 and 7.31 million tons in 2012. Since 2007 the pulp exports exceed pulp import, while it used to be the opposite situation between 1997 and 2007.

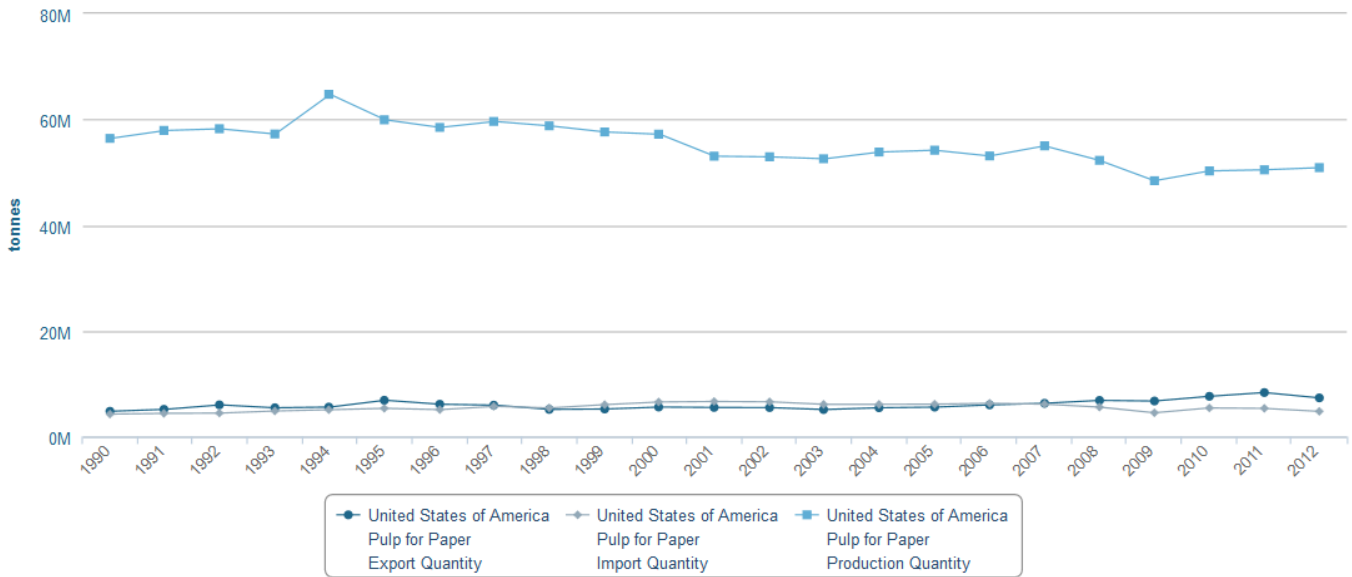


Figure 9 : Production, imports and exports of pulp and paper in the USA between 1990 and 2012
(source : FAOstat)

The exported volumes of chips and particles also show an increase in recent years, from 3.8 million m³ in 2005 to 5.4 m³ in 2012 (Figure 10). During the same period the imports have decreased and were at a negligible level in 2012. The proportion of exported chips and particles, compared to the domestic production, used to be 17% in 2005 and have reached 37% in 2012.

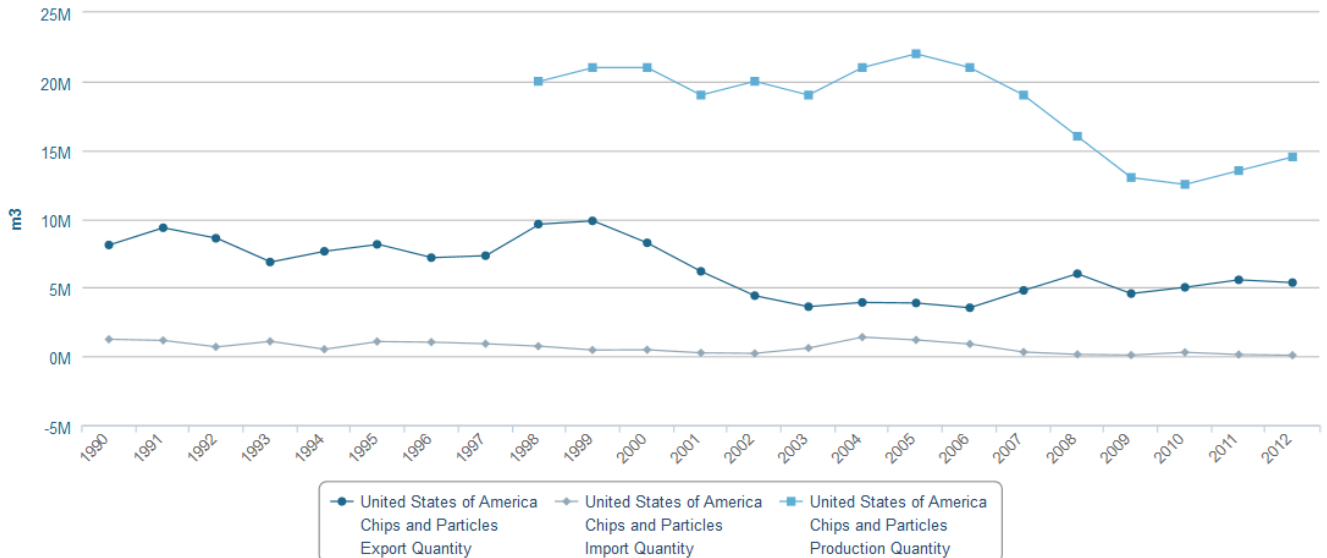


Figure 10 : Production, imports and exports of chips and particles in the USA between 1990 and 2012
(source : FAOstat)

The imported volumes of wood-based panels have sharply fallen since 2005, following the same decreasing trend as the domestic production (Figure 11). During the same period, the exported volumes have remained negligible.

After a sharp decrease of sawnwood imports between 2005 and 2009 (following the same trend as domestic production), the imported volumes have been rather stable (Figure 12). A very large majority of the imports is from Canadian origin. According to Howard & Westby (2013)⁴, the imports of Canadian lumber (processed timber) currently contributes to keep the prices of softwood low, which does not help the sawmill sector to recover from the crisis.

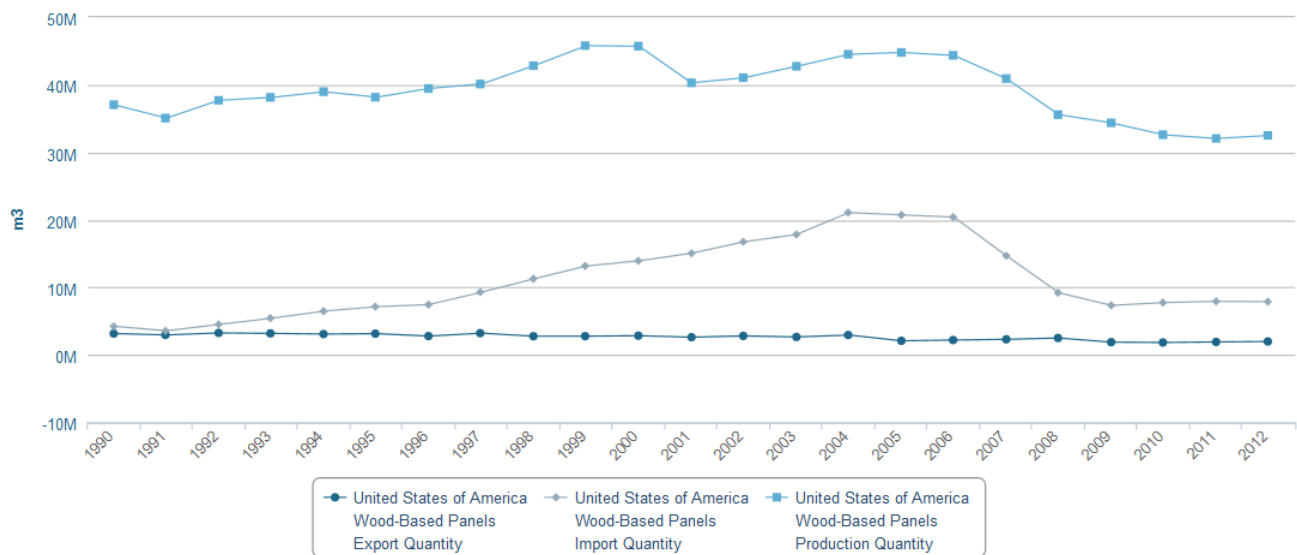


Figure 11 : Production, imports and exports of wood-based panels in the USA between 1990 and 2012
(source : FAOstat)

⁴ Howard, James L.; Westby, Rebecca M. 2013. U.S. timber production, trade, consumption and price statistics 1965–2011. Research Paper FPL-RP-676. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.

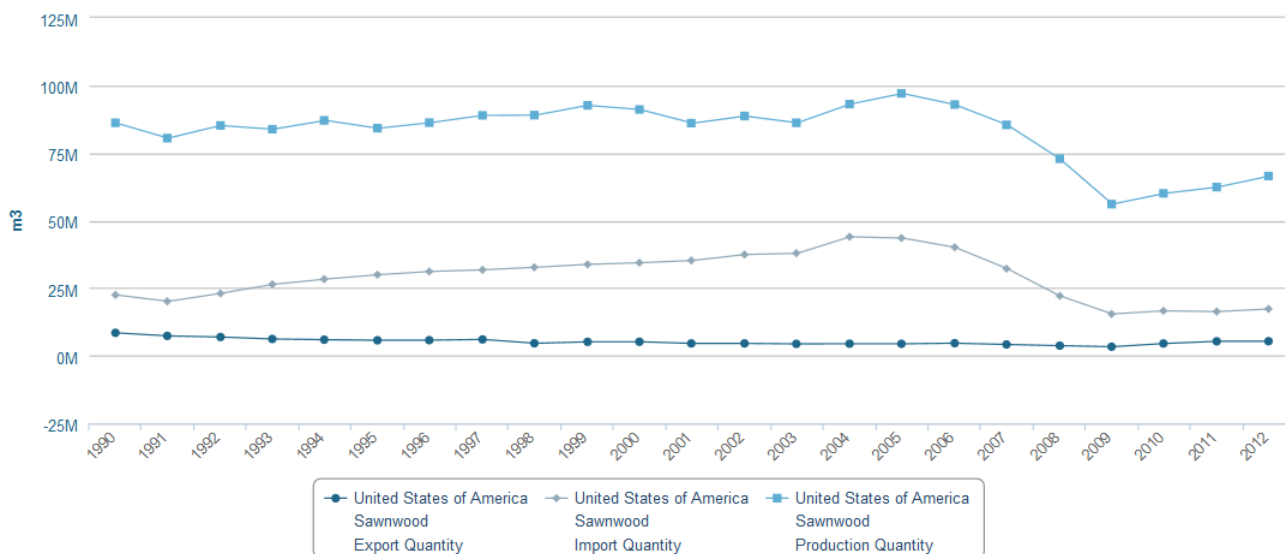


Figure 12 : Production, imports and exports of sawnwood in the USA between 1990 and 2012 (source : FAOstat)

Also according Howard & Westby (2013), a recent increase in the imports of cheap furniture from Asia to USA is responsible for difficulties for domestic producers of furniture and their suppliers of wood boards and wood panels, resulting in a lower demand for those products on the domestic market.

If we look more particularly at the exports from the North-West, we can see that the exports of round wood and sawnwood have been depressed since the early 1990ies and have started to rise again after 2007 (Figure 13). This evolution mostly reflects the exports to Asia. The exports to Japan, which used to be a major driver for the industry between the late 1960ies and the 1980ies, have strongly slowed down between the late 1980ies and 2000 (Figure 14). However, those exports have started again in full force with demand for timber wood from China, with a strong increase after 2007 (Figure 15).

Unlike in Canada, where most of the wood exported to China is lumber, most of the wood exported from North West USA to China is roundwood. Even though China is a good market with attractive prices for timber loggers, it also creates competition for raw materials with the domestic sawmills. The price of timber are going up (see section 4 - Price of wood resources) and the availability of large diameter timber remains a limiting factor for the sawmill industry⁵. It is reported that many facilities can not run at their maximum capacity because of scarcity and high price of round wood⁶. In order to

⁵ Policy Analysis Group - College of Natural Resources , 2006, Idaho's Forest Products Business Sector: Contributions, Challenges, and Opportunities.

⁶ <http://earthfix.opb.org/communities/article/lumber-mill-exports-to-china/>
https://www.campbellglobal.com/downloads/public/publicationdoc/Aug_11_TT.pdf

protect the domestic sawmills, the Federal US authorities have banned log export from federal lands in 1968 and from state lands in 1990⁷.

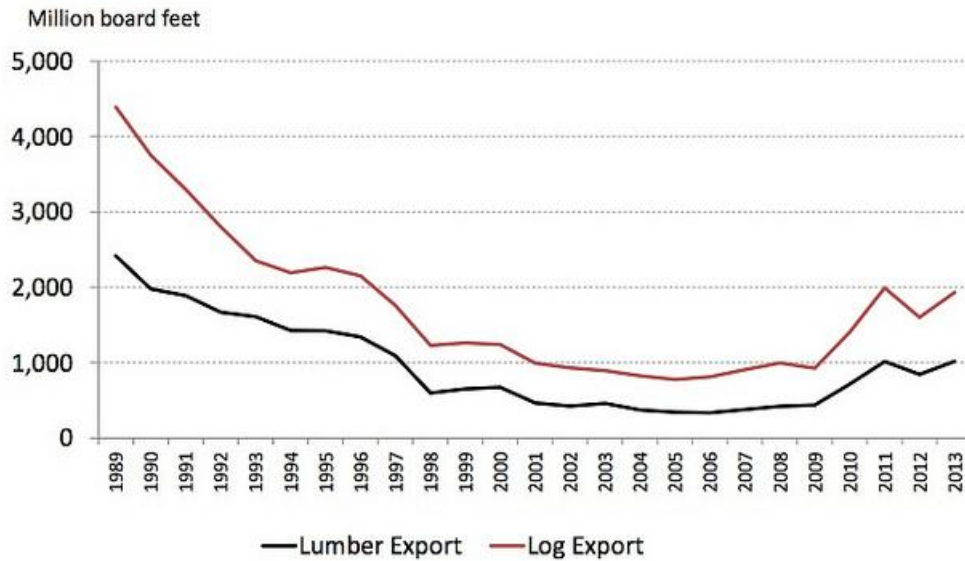


Figure 13 : West Coast logs and lumber export (1989 – 2013)

source : USDA Forest Service cited in <http://earthfix.opb.org/communities/article/lumber-mill-exports-to-china/>

⁷ <http://portlandtribune.com/sl/201307-chinese-thirst-for-wood-driving-demand-for-northwest-logs>

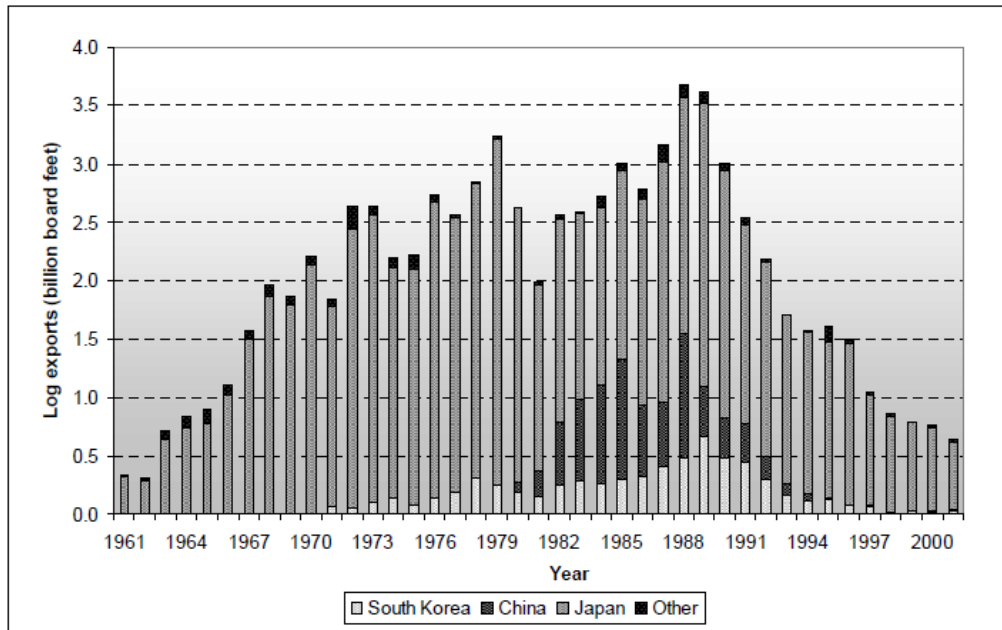


Figure 14 : Timber logs exports from US Northwest to Asia (1961-2001)
(source : JM Daniels, 2005, "The Rise and Fall of the Pacific Northwest Log Export Market", USDA, Pacific Northwest Research Station http://www.fs.fed.us/pnw/pubs/pnw_gtr624.pdf)

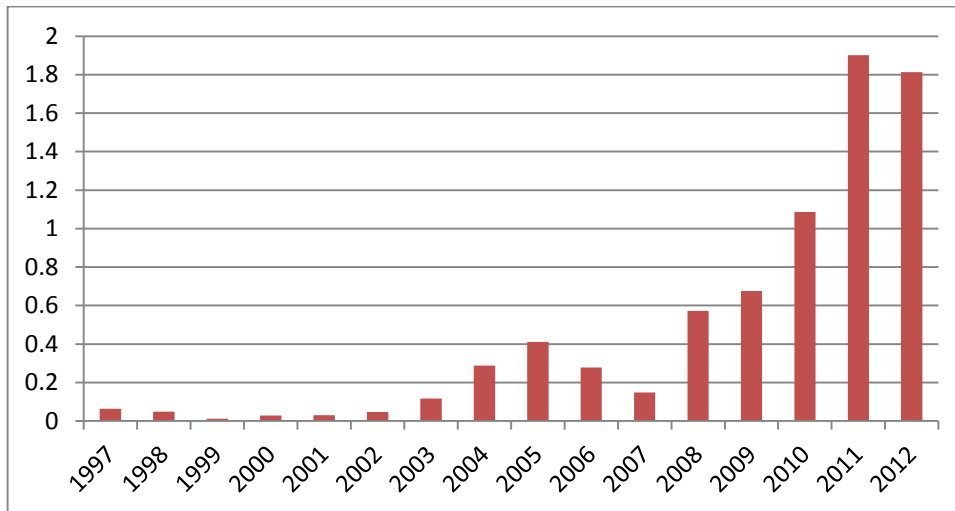


Figure 15 : Timber logs exports from USA to China (1997-2012)
(source : FOAstat)

6. Conclusion

The analysis of the wood market in the North West states of the USA, shows that the decrease of the harvests has started much earlier than in the South-East states, as soon as the early 1990ies and for other reasons:

- policy change in the management of National Forest, radically reducing the clear cuts and the harvested volumes, in an unsuccessful and controversial effort to protect some threatened species (especially Spotted owl),
- decrease of the demand in Japan, which used to be a major market for North West USA between the 1970ies and the late 1980ies,
- difficult competition on the sawnwood market, because of very low price of timber from Canadian public forests, available to Canadian sawmills and not to US sawmills (this presumably affected more immediately the North West states with a border with Canada, than South East USA).

The decrease in round wood availability, together with cheap imports of lumber from Canada, resulted in a reduction of the number of sawmills, as well as reduced activity levels for the remained mills. This took place at a time when the demand for wood for construction in the USA was still very high, and obviously did not get any better when the demand collapsed with the start of the Subprime Mortgage Crisis and recession in the building sector.

Since 2007, the rising demand for wood from China resulted in a very quick growth of the exports from Western USA (including North West, California and Alaska). In 2012, the round wood exports from USA to China were 2 billion board feet, which is nearly equivalent to the yearly roundwood production in Montana and Idaho put together. Unlike the exports from Canada to China, the exports from USA to China are mostly roundwood, which means less large diameter round wood available and higher prices of raw material for the domestic sawmills in the North West.

The prices of pulp wood in the North-West remained rather stable during the economic recession in the period 2005-2010. The pulp market is not affected by the rising demand for export to China, as it concerns another category of timber (especially smaller diameters).

The prices of sawmill residues have followed the same evolution as sawnwood, to some extent, with an increase observed in recent years, presumably because less and less timber is being processed in local sawmills.

With the increase of wildfire frequency and seriousness in the North West over recent years, actions are undertaken to reduce the wood fuel on the land, in an effort to prevent the propagation of wildfires. It involves in particular the removal of fire fuel in forest understory and a reduction of trees density. As a result more and more small diameter timber is being harvested (thinings), which are not

suitable in sawmill production, but constitute valuable resources for panels, pulp and paper and biomass sectors.⁸

More and more forests in North West USA are affected by the mountain pine beetle outbreak. The diseased and dead trees have to be removed, but are often not suitable for the sawmill industry any longer. It is however reported that such trees can meet the needs of the Chinese importers, whose major activity is the production of formwork for the building industry. The biomass industry (local uses and export) is also a major option for the use of the wood from forests affected by beetles.

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⁸ Policy Analysis Group - College of Natural Resources , 2006, Idaho's Forest Products Business Sector: Contributions, Challenges, and Opportunities. Contributions, Challenges, and Opportunities.