

## **FLOATING – THE TRADITIONAL WAY TO TRANSPORT TIMBER IN FINLAND**

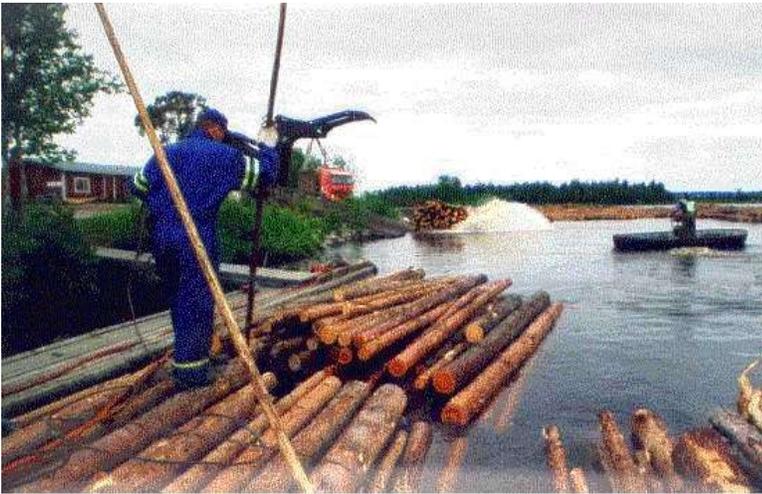
*Floating was once of vital importance for getting timber from remote forests to the mills. Almost all lakes, rivers and even burns in Finland have carried timber at some point. The volumes transported by floating were highest at the beginning of the 1960's, but have since then declined gradually. Some years ago many people even predicted death of floating. However, systematic improvements have increased the compatibility of the mode and, for the time being, the outlook for floating is actually quite good.*

Free floating was long the dominant form of floating. Untied logs moved down the river with the stream. On open lakes they were circled by booms and towed in rafts. Free floating in small waters disappeared gradually with the development of the road network and timber lorries. The last active free-floating routes were the River Ii and River Kemi in Northern Finland. Free-floating on the River Kemi ended as late as 1992, when the activity was replaced by a rail shuttle. Since then only bundle floating has been used. The bundle floating has been mainly located on the big lakes in the central and eastern parts of the country.

The volumes were highest at the beginning of 1960s, when almost 14 million cubic meters of timber arrived annually by floating to the mills. This was about 40% of the contemporary industrial consumption of domestic wood. Since then, the volumes have gradually gone down due to the development in road transport and the mechanisation of timber harvesting. In recent years, around 1.3 million cubic meters (1.1 million tonnes) or 2.6% of the domestic timber volumes have been transported to the mills by floating. The average distance has been around 240 km (150 miles) and the costs, without pre-transportation, 21 Fim[Finnish Marks]/m<sup>3</sup> (£2.5 per tonne). This is equivalent to 0.087 Fim/m<sup>3</sup>-km (£0.016 per tonne-mile). The rule of thumb has been that floating is the cheapest mode of transport for distances over 100 km (62 miles).

### **Technology and operations**

Bundle floating requires facilities for making the bundles and putting them into the water, as well as picking up and dismantling them at the mill. Also, moving the timber in the water requires its own technology. The traditional way to make bundles and dump them into the water has been to wrap the timber with two steel wires while still on the lorry. To ensure that the bundles do not break up when dropping them into the water, each bundle was secured with a strong self-releasing dumping chain. The dumping site was normally leaning towards the water. Alternatively, the lorry was tilted by driving one side up on chocks. The uprights were released and the bundle glided along tracks into the water. Once floating, the dumping chain was released. Some lorries had a side tipper to support dumping. The same dumping technique was used when unloading timber on ice in the winter. Leaning the vehicle and release of the uprights has now almost disappeared. The bundles are normally lifted off the lorry and moved into the water by mobile loaders. Mobile bundling pontoons, directly accessible by the forwarder, have been used for years when operating on islands.



**Figure 1.** Dumping bundles and assembling a raft (Photo: Pohjois-Savon ympäristökeskus)

In the water, wire straps are used to link the bundles together to form a raft. For timber unloaded on ice, this operation is carried out while the ice is still bearing. Each bundle is clearly labelled and the raft is formed in such a way as to facilitate separation for multiple drops on the way downstream. Each bundle contains about 17 m<sup>3</sup> of timber. Each raft is often composed of 10 rows of 100-120 bundles, giving raft volumes of 17,000-20,000 m<sup>3</sup>, equivalent to 400-500 Finnish or 600-700 British lorry loads. A tug of 300-400 kW pulls the raft, while smaller tugs are used for steering and guidance. During the floating season - from mid-May to mid-November - the pulling tug operates 24 hours a day, seven days a week.

Downstream, closer to the mills, the loads are split up and the timber delivered to appropriate mills. At the mill, the bundles are disconnected from the strings, picked up, and loaded directly on to a lorry or a farm tractor-trailer, where they are dismantled from the steel wires. The transport from the port to the mill gate is often a short internal haul.

Floating has largely been organised as “joint floating” carried out by floating associations on behalf of their associates. Forest industry and timber supply companies have also directly managed “private floating”. In recent years, private floating activities have been largely transferred to the associations. The floating associations have also merged, so there is only one left: The Floating Association of Lake Finland. Another development has been the outsourcing of the companies’ or associations’ towing activities to private subcontractors.

### **Green quality deliveries Just In Time**

The nature of floating has changed. Earlier floating was slow and based on building up a large stock in the winter. With the development of the timber supply chain, this became a burden for floating, and increasing volumes turned to direct road transport. However, much has been done to improve the competitiveness of floating. The operations have been speeded up and there are strict timetables for the activities. Sawlogs are transported to some sawmills as scheduled deliveries. Despite good scheduling when operating, floating is still seasonal. The winter break is a hard nut to crack.

Quality issues were another threat for floating. Some years ago there were serious discussions about sawlogs turning dark in the water. Fast scheduled transports have also helped here a lot. Actually, the observed problems with darkening saw logs was more due to the practice of the mills having bundles lying in the water than to the transport method itself. To prevent the upper side of the bundles from drying, timber for mechanical pulp is sometimes sprinkled all the way from the dumping bridge to the mill. Fast transport is also good from an environmental point of view: it prevents bark and other particles from loosening as well as chemical substances from dissolving in the water, though this has never been a problem in Finnish conditions.



Figure 2. A raft gliding along a narrow water on its way to the mills (Photo: Laitaatsiltayhtiöt).

Floating is the best timber transport alternative with regard to fuel consumption and carbon dioxide emissions. Referring to calculations by the Floating Association of Lake Finland, fuel consumption for floating is only 0.0033 litre/m<sup>3</sup> km. The proportions for the different modes are as follows: floating 100, ship 125, train 400 and lorry 1,200. Water does not wear down due to the movement of goods as roads and railroads either.

### **Floating – an option for the future?**

Floating is the cheapest mode of transportation for distances over 100 km and floating has some significant environmental benefits as well. The problem has been the inability of the mode to fill the requirements of a modern timber supply chain with regard to timing, speed and quality. However, a lot of work has been done to remove these disadvantages and the results are promising. It is expected that floating will remain as a significant transport mode in the future. Some people even believe in significantly increasing volumes due to environmental benefits.

Bundle floating is probably not a method of transport that could be introduced in Britain. Strong wind and poorly floating timber are potential problems. However, there may be conditions where floating is a real alternative. The biggest problem for floating in Finland - seasonal activity due to frozen waters - does not exist here. The bundle “philosophy” is interesting in its own right. Bundles are easy to prepare, handle and dismantle. They also contain far less steel and much more timber than the freight containers which, it has been suggested, could be used in Britain.

Sources:

Laitatsiltayhtiöt. Web site ([www.laitaatsilta.fi](http://www.laitaatsilta.fi))

Purhonen, Ilkka. 2001. Uitto tänä päivänä Suomessa ja erityisesti Kallaveden alueella. Ympäristöhallinto. Ympäristöpalvelut. Web site ([www.vyh.fi](http://www.vyh.fi)).

Timber harvesting and transport cost statistics for 1998, 1999 and 2000. Collected by Metsäteho Oy