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Intensifying forestry in NW Russia? - *The roles of landscape history and tree growth*

- Inspired by Fennoscandian forestry, current Russian forest policy advocates intensification to reach higher sustained yields of wood as a base of economic growth.
- This requires knowledge about the consequences of regional forest histories, about the biological opportunities for tree growth, and about society.
- Focusing on a regional logging frontier in the Komi Republic in NW Russia we studied the history of wood use in terms of landscape changes, actors and their ideology.
- Past wood mining resulted in large areas of unmanaged young and middle-aged forests dominated by birch and aspen, and remnants of remotely located older spruce forests.
- To understand if biological conditions in NW Russia limit tree growth, we compared tree growth rates of young Scots pine and Norway spruce trees at different site types and latitudes in NW Russia and Sweden.
- While there was no difference in growth rate of young Scots pine between countries, Norway spruce grew more slowly in NW Russia. However, it was difficult to find young spruce trees growing freely without competition.
- Spatial planning is needed to segregate intensified wood production and forest management that also benefits rural development and biodiversity conservation.
- Ultimately, to succeed with intensification in the context of sustainable forest management also economy and society must be studied.

Policy for higher wood production

During the Soviet period (1921-1991) forestry in today's NW Russia could be described as wood mining. Since 2007 Russia's forestry policy stipulates the need to intensify wood production in already harvested areas. This policy is supported by forest industries. Intensifying forest management means to introduce silvicultural operations aimed at increasing sustained yield wood production per area unit. These may include active regeneration, pre-commercial cleaning and commercial thinning, as well as fertilization and plant breeding.

Forest landscape history

To understand how this policy could be implemented at the regional level, we chose Kortkeros municipality in NW Russia's Komi Republic as a case study. To study how the past history of wood use may affect the future development three aspects were examined for NW Russia and Kortkeros: (1) changes in the natural environments of the past, (2) the technology behind landscape development, (3) values, perception and ideology that supported changes.

Industrial utilization of boreal forest in NW Russia began in the end of 19th century, and attempts to intensify sustained-yield wood production were taken several times during the 20th century. In Kortkeros the major industrial use of boreal forest started in 1927, but took off only after 1965. Today, large areas of unmanaged middle-aged forest dominate accessible areas.

State and private forest companies began industrial logging for export. Wood mining continued during the Soviet period with the state as the only actor. Today, both state and private forest companies harvest wood on leased forest areas.

During the past two centuries the forest use ideology swung between market and planned economy. The first industrial interest in wood was military and trade. During the Soviet period forest industry enterprises and forest management units were integrated to increase wood harvest. After the collapse of the Soviet Union in end of 1991, the Russian federation's government changed its course to market economy again.

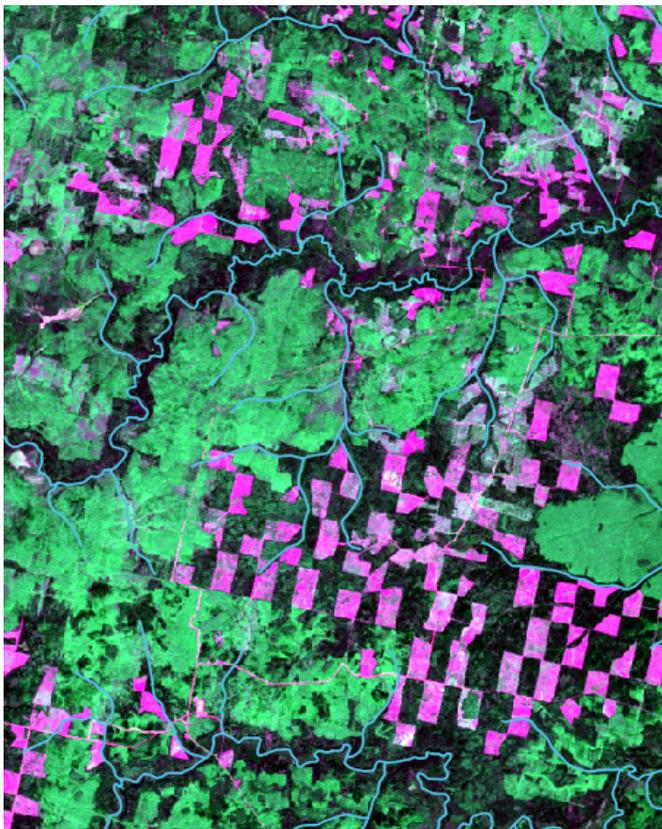


Image by Vladimir Naumov, based on data from US Geological Survey

Satellite image of Kortkeros showing younger forest after clear-cutting made 1965-1990 (light green; top right), protection zones with old and old-growth forests along rivers (dark green; bottom right) and checkerboard of clear-cuts (up to 500 by 1000 m) in the remaining but unprotected forest created 2010-2013.



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Measurements of tree growth was made in three different site types. Poor site type with lichens and heather (left), mesic site type with dwarf shrubs and grasses (centre), and rich site type with tall herbs (right).

Tree growth rates

Are growth rates of young coniferous trees on different site types across latitudes in NW Russia and Sweden the same? To find out, we visited 10 randomly selected stands in poor, mesic and rich site types at latitudes 64, 62 and 60 N in both countries, and measured 5 long shoots of 30 young Scots pines and Norway spruces.

Young Scots pine long-shoot lengths did not differ, and should thus, if managed in the same way, produce the same amount of wood in the long term. However, for Norway spruce we found that growth rates were higher in Sweden than in Russia. However, finding stands with young Norway spruce trees growing without competition for light in Russia was difficult. The reason is that spruce regeneration is encouraged by leaving suppressed understorey trees during clear-felling. By contrast, in Sweden it was easy to find stands where spruce was planted and pre-commercially cleaned, and hence grew with little intra- and inter-specific competition.

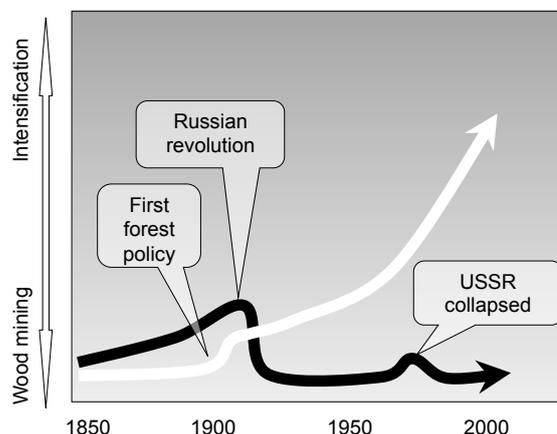
Next steps towards intensification

The tree growth results indicate that there are no biophysical obstacles to increase wood production in NW Russia. Instead, there are several obstacles that hinder changes in forestry on the ground. For example, introducing pre-commercial thinning and a functional road network are prerequisites for intensified wood production. However, from the perspective of tree growth rates, the main focus of intensification in NW Russia in the long term ought to be concentrated to southern regions where growth rates are higher. Additionally, there is a need to consider both human well-being in rural areas, and ecological integrity at landscape level.

Thus, to satisfy economic, ecological and social dimensions of sustainable forest management policy, spatial planning of landscapes and regions is needed. Past Russian and Soviet legacies of landscapes zoning with different profiles of benefits from forests should thus be maintained. Ultimately, however, improving silviculture and transport infrastructure are insufficient measures to achieve higher wood yields. In addition, experiences from Canadian provinces should be evaluated. Finally, stable institutions and secured rights are needed to make necessary investments for intensification.



Above: Sites where tree growth was measured. Right: Russia (black line) and Sweden (white line) have different trajectories of forestry development. In Russia intensification occurred already before the Russian revolution, and then in the 1970s. Sweden developed intensive forest management system gradually.



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Read more

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Layout: Mikael.Angelstam@slu.se | Forest-Landscape-Society Research Network,

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ISSN: 2001-5801

www.pub.epsilon.slu.se and www.euroscapes.org

