

5th Forest Engineering Conference

Contribution 181 in session "Forest operations: environmental concerns and natural hazards"

Reducing land damages using optimization for efficient logging planning

Authors: Westlund Karin, Jönsson Petrus, Andersson Gert, Flisberg Patrik, Rönqvist Mikael

Skogforsk, Sweden, karin.westlund@skogforsk.se

Keywords: optimized logging trails, land damages, logging operations

Minimizing the terrain transportation is important in order to reduce rutting and fuel consumption and render overall logging more effective. Due to the climate change, with more rain and higher temperatures during winter time, the need and interest of a planning tool for logging operations is of great interest in Sweden.

Today logging planning is mostly done manually with traditional data sources. The presented planning tool uses LIDAR (low or high resolution) together with soil and water maps presenting ground water levels, to calculate effective logging routes with given main and strip roads. The LIDAR cluster tree information to 3x3 meters of trees to simulate bucking patterns, output volumes and assortments, as well as very precise geographical information of the terrain model in three dimensions.

Planning a site, one must pay attention to more than one factor such as avoiding logging close to ditches or streams, peatland, conservation areas and historical sites, information today available in shape files. The trails must also be technical functional and cost effective for the logging machines and consider the volumes at the site, e.g. how many times the forwarder must pass a trail.

The road network given from this planning tool, taking into account all above input data, will suit both harvester and forwarder with respect to cost and land impact. Since most harvesters and forwarders in Sweden today have onboard computers to follow production and location, the optimized road network is today possible to show and follow on the screen using Google Maps.