Baltic ForBio

Baltic ForBio, WP 2, GA 2.4

Information about thinnings demonstrating biofuel and roundwood production (714-244-5)

Information about stand

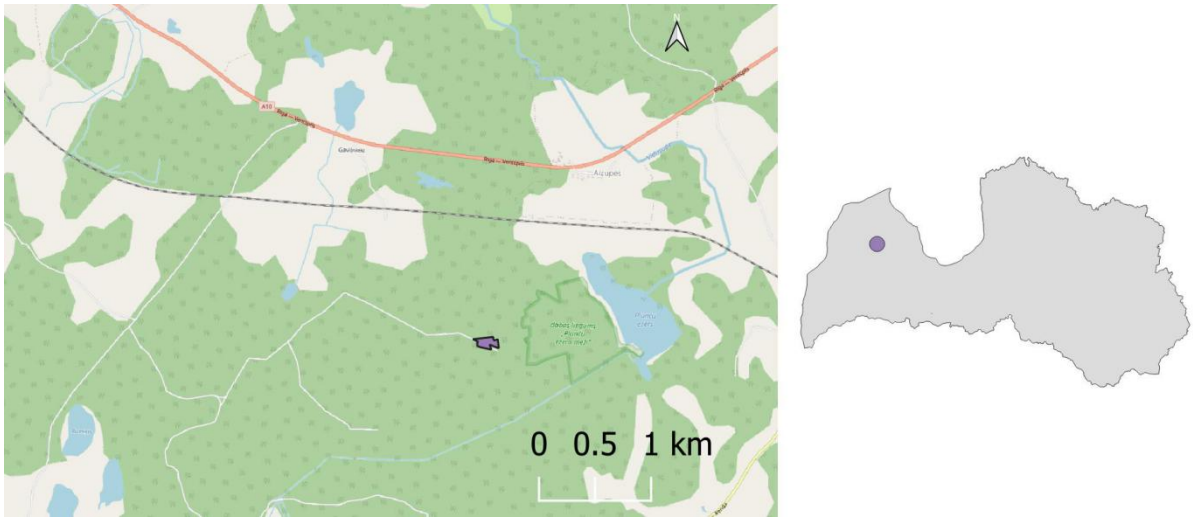
Basic information

State	Latvia
Region	Kurzeme
Stand ID (region - block - compartment)	714-244-5
Area (ha)	1.6
Thinning year / season	2016 / summer
Topic	Commercial tinning, using Vimek 404 T5 aequipped with Keto Forest felling head

Characteristics of work environment and soil bearing capacity

Good logging conditions, logging can be done all year round without the use of tracks and without placing logging residues in technological corridors.

Location of demo site



Coordinates of plot centre: X - 401064 Y - 338207 (LKS92)

Figure 1: Location of compartment[1].

[1] Background map from Google maps and map of Latvia from www.envirotech.lv

Stand characteristics before harvesting

Average DBH (cm)	14
Average height (m)	12
Number of trees (trees per ha^{-1})	1520
Growing stock (m^3 ha^{-1})	119
Stand composition	10P
Stand age during thinning	38
Dominant species	Scots pine
Stand type	Dm (*Hylocomiosa)*

Stand management targets

To increase the value of forest stands by felling damaged and small-sized trees and to provide favourable conditions for the further development of the stand. Logging should be carried out in such a way as to minimize adverse effects on the environment (avoid ruts, prevent mechanical damage to permanent trees and soil compaction). Use small-sized trees for the production of biofuels and roundwood logs (pulpwood and small logs) from larger-sized trees.

Stand characteristics after thinning

Average DBH (cm)	16
Average height (m)	18
Number of trees (trees per ha^{-1})	653
Growing stock (m^3 ha^{-1})	97
Stand composition	6P4E
Dominant species	Scots pine

Figure 2: Stand characteristics after thinning[2].

Mechanical damages due to thinning

Damage to remaining trees does not exceed 3%, no ruts have been detected.

Applied work method in thinning

The distance between the technological corridors is 20 m, in the middle between the technological corridors forming "ghost roads", along which the harvester moves during thinning.

Timber is placed along technological corridors.

Undergrowth is not cut before thinning.

The applied work method considers leaving of small dimension trees (including technologic corridors if their $D_{1.3} < 6$ cm, if they are not hampering harvesting operations, but, if such small tree is harvested (cut down) it should be dropped without delimbing in area where it is not becoming an obstacle to harvesting and forwarding operations

Harvesting is done using compact class harvester Vimek 404 T5 a equipped with Keto Forest felling head (2. Fig.). Harvester is equipped with CAT C2.2T engine[3] (44 kW, 2700 RPM,); harvester width 1.8 m (with large tyres – 2.15 m), length – 3.35 m; tyre size 405/70-24; MOWI 2046 crane reach distance 4.6 m, weight 400 kg; clearance – 40 cm; harvester weight – 4400 kg; fuel consumption – 4 L per hour; control system – Motomit IT.

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2 Photo G. Spalva.
3 In previous models Kubota V2003T engine

Forwarding is done using compact class machine Logbear F4000.

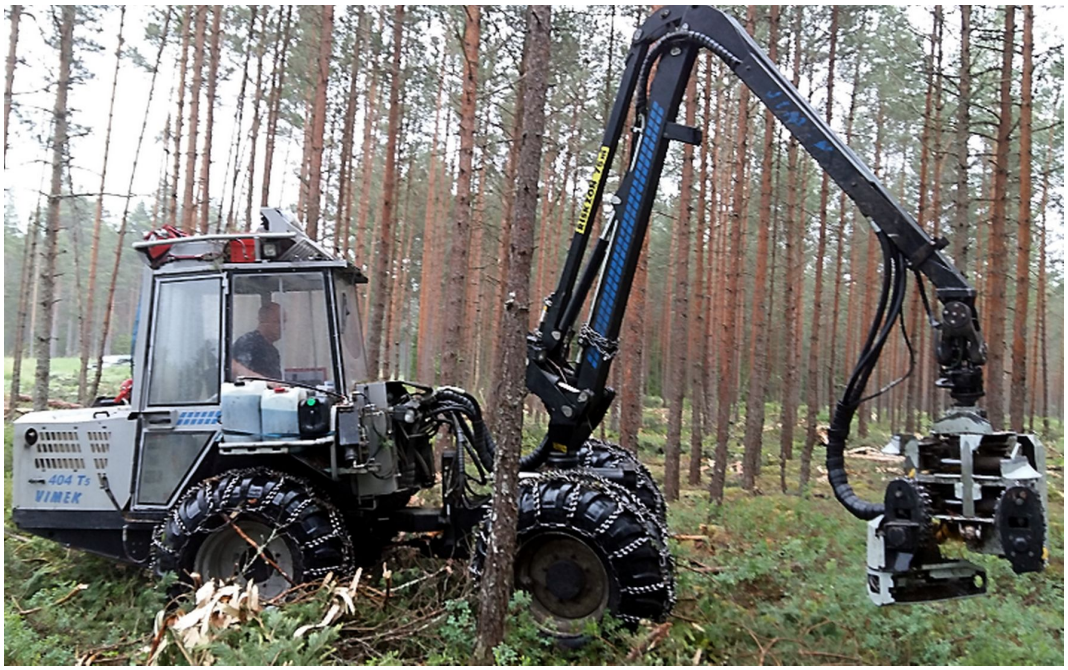

Figure 3: Harvester Vimek 404 T5[4].

Figure 4: Logbear F 4000 forwarder[5].

Harvesting productivity

When preparing biofuel in young stands in thinning (average sawn wood $D_{1.3}$ 9 cm or 0.04 m^3),

[4] Photo: G. Spalva.
[5] Photo: P.O. Johansson.