

1 Supplementary Information to "Human impact on forests of early 20th century Finland"
2 submitted to Landscape Ecology, by: Tuomas Aakala, Niko Kulha, and Timo Kuuluvainen.
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7 **Supplementary Information 1: locating the sample plots.**

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9 To locate the plots and to assess the uncertainty in this location information, we devised the
10 following procedure:

- 11
12 1. The approximate location of each inventory line was digitized from the map in (Ilvessalo
13 1927).
- 14
15 2. Inventory lines were not completed one at a time, but in shorter parts; some from SW to NE,
16 some from NE to SW. As each compartment also contained information on the parish in which it
17 was located, we then digitized the parishes from the Atlas of Finland 1925 (Witting 1928).
18
- 19 3. We located each compartment along the inventory line using the recorded distance from the
20 line beginning, and examined how well the parish information fitted the digitized locations
21 within each parish.
22
- 23 4. Using this information, we determined the line parts that were running from SW to NE, and
24 lines running from NE to SW.
25
- 26 5. Some parts of the lines ended and started at parish borders, which made it easy to decipher the
27 correct order. However, some parts did not. We then realized that the line parts that these later
28 cases were located along railroads (railroads were one compartment type recorded in the data).
29 We thus digitized the railroads from the Atlas of Finland 1925 (Fig. 1, Witting 1928).
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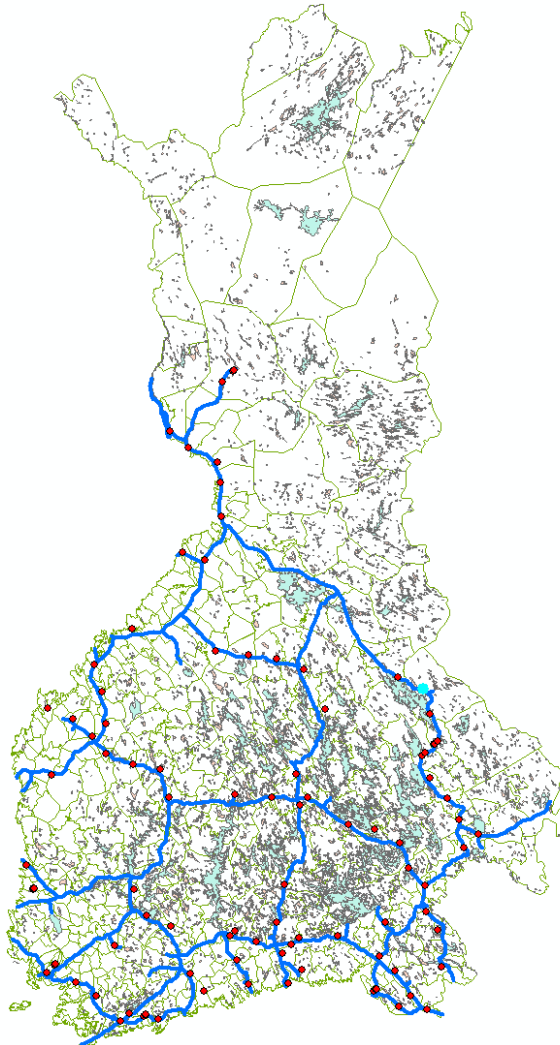


Fig. 1. Parishes, railroads (blue lines), and compartments along the inventory lines that were assigned into class “railroads”.

6. Using parish borders and railroads, we then placed each compartment on the map. The railroad information was at this point used only to determine the direction in which the inventory crew was moving at a specific part of a line. We did not use this data to make any location adjustments, but retained it as “independent” data to verify the location procedure (see below).

7. As some compartments fell on water bodies, we moved each compartment to the next stretch of dry land along the line. Water bodies were obtained from the GLWD-database (Lehner and Döll 2004).

46 8. From these compartments, we then compared the recorded parish information to the digitized
47 parish map, and calculated the percentage of compartments falling into the correct parish.
48

49 9. To make small adjustments to the exact line location, we moved each line origin at 500 m
50 intervals up to 3 km NW and SE directions (i.e. 500 m, 1000 m, 1500 m, 2000 m, 2500 m and
51 3000 m) and re-calculated the proportion of compartments falling into the correct parish. We
52 selected the option with the most correct parishes as the location of the lines for locating the
53 plots. As we have no information on the exact origin of the lines, nor the small changes in the
54 direction along the line, this procedure was an attempt to improve the location estimate, but it
55 should be noted that it is by no means assumed as the exact location (see below).
56

57 10. As the last compartments along each line fell short of the line on the map, we then divided
58 the missing distance equally to all compartment along the line.
59

60 11. To assess the uncertainty related to the locations independently, we compared the locations
61 of compartments recorded as railroads to the nearest railroad. Assuming that the minimum
62 distance represents the error associated with the locations, 90% of the compartments fell within 8
63 km of their true location (Fig. 2), which we deemed sufficient for our analyses. In addition, there
64 were a few outliers in the data that were located in parishes that did not have railroads in the
65 Atlas of 1925. We suspect that these may have been either small stretches of railroad related to
66 industrial activities, or recording errors, not errors due to our location procedure, so the true
67 location error is likely to be smaller than the 90% / 8 km in the southern part of the country.
68

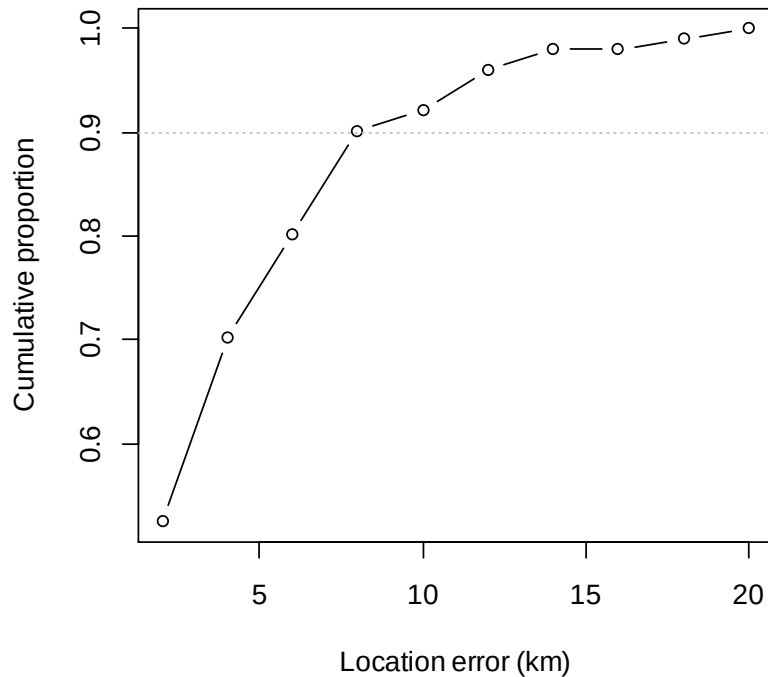


Fig. 2. The cumulative proportion of railroad compartments and their minimum distance to the nearest railroad, as digitized from the Atlas of Finland 1925.

11. Once the compartments were located, we located the sample plots by matching the line and compartment information that was recorded for each plot. In cases in which there were multiple sample plots located in the same compartment, we distributed the plots to 1 km distance from one another along the line, in the direction the line had been measured.

References

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