**State of the crown measurements as of 31.8.2016**

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The first measurement round (of the whole tree set in file IK\_PUUT.csv) was finished in 13.8.2016. The produced file is mittaukset.txt. It has 21690 records, and may miss some trees of the IK\_Puut.csv file, and may have some duplicates.

The input file was IK\_Puut.csv, into which the (since 2013 established) field plots of 2015 were added by RH in the summer of 2016. It has 21705 records.

The measurement work was divided between IK (1-10281 and 12866-13548) and RH (10282-12865, 13549-21705). The numbers refer to lines/records in IK\_PUUT.csv. N.B. the program evolved during the project that began in 2014.

When the first measurement round (2014-August 10, 2016) was complete, the "notes" column was harmonized as it had far too many descriptions of the status of the crown. The resulting file, mittaukset.txt had the following notions for a tree in the last column.

- ok

- Not Visible

- No model [too few lidar echoes]

- No lidar [Stand cut or tree vanished/fallen before LiDAR of 2012 or 2013]

- Not located [tree may exist, but the correct crown was not discerned by the operator]

- Poor model [Poor distribution of lidar echoes OR very deformed crown, poor visual fit]

- Doubtful [May or may not be a tree, a correct tree, or correct location within the tree, only visible in LiDAR for example]

- Dead but measured [see below, \*\*]

- Alive [3 occurrences... was marked dead in the field in 2015, but still alive in 2012 CIR imagery]

- 14 (slanted tree)

- 21 [The status had changed to dead standing]

- 22 [The status had changed into broken dead trunk]

- 23 [The status had changed into fallen trunk, when visible]

- 31 [Cut, most likely occur only in field plot marv1\_131. Some

- 12a3 [tree clearly has an exceptionally short crown]

- 12a4 [top broken, living]

- 12a5 [dry/dead top]

- SpErr # # [Wrong species, # refer to original and new species]

(See classes in http://www.helsinki.fi/~korpela/MARV1\_2015/Suuntakorjaus.docx)

\*\* All "Dead but measured" cases from the measurement round #1, were checked in round #2, and classified according to the visual appearance and the status information from field. Only the changes in the status were recorded, e.g. if the tree was doomed "21" in the field, and appeared "21" in the image/LiDAR data, the status recorded was ok.

N.B. Two DEMs were applied during the measurement round #1, which influences the butt-elevation-estimate.

---- Q/C Analysis ---------

In August 2016, the measurements we checked for gross errors, especially as the program had evolved during the course of the work, i.e. measurement round #1.

A separate version of KUVAMITT was written to support the task. It is in the folder: \Kuvamitt\_latvustenmittaus\_tarkastusversio

The input files were the original IK\_PUUT.csv and the output of round 1, mittaukset.txt. The program outputted into changes.txt in cases where there was something to correct.

The work was done as follows:

Lines 1-5000 in IK\_PUUT.csv were checked.

Lines 4558-4774 were omitted, because LiDAR data was not retrieved for the area **(TBD**!)

All changed measurements were saved to file changes.txt, which has the same format as mittaukset.txt.

In case of multiple instances of the same tree in mittaukset.txt, the program suggested the checking of the last. The duplicates were removed.

The program also warned, if mittaukset.txt did not have an observation for a tree. These were measured and added back to the mittaukset.txt.

If last column of mittaukset.txt had "21", but StatusOld or Status13 already had the same "21", the last column was changed into ok. NB.

Majority of changes were a slight expansion of the previous model. Also some were slimmed. More of both could have been done, but it was decided that about ok was good enough, in order not to change too many trees and to reach more of the worst cases. In some cases, the location of the top was also moved, when the laser points indicated a better location. A few trees were completely wrong trees (< 5?) and a few seemed to be not visible. Doubtful was added into several cases.

In some cases it was only indicated that the model was poor. If nothing else was done to the model (e.g. F4, restore), the new KUVAMITT copied the model parameters from the previous changed tree. Although known, this erroneously happened in several cases within the field plot with small pines containing plenty of poor models (MARV10\_6A and 6B). To correct, the rows were later copied from mittaukset.txt (+Poor model added). This is mentioned here, bcs the ground elevation in the copied rows is then also the same used by IK, so there are 2 differing ground elevation sources in the changes.txt.

Then, it was jumped into the row 13549, where RH started her measurements in the spring 2016, as the beginning was the most suspicious due to lack of experience. Rows 13549-14604 were checked and same actions were taken as described above.

Note: the 2nd round automatically excluded the following cases:

Not Visible, Not located, 22, 23, 31.

**FILES**

changes.txt

IK\_Puut.csv = IK\_Puut\_Reija.csv

MARV1\_2015\_all-RHnaslund.xlsx (2015 pienten puiden pituudet)

mittaukset.txt (ensimmäisen kierroksen mittaukset, duplikaatit ja puuttuvat huomioitu tarkastetulta osalta)

R-for-Naslund.docx (r-skripti)

State-of-crown-measurements-Aug2016.docx (tämä dokumentti)

\*\*\*\*\* MITÄ PITÄÄ TEHDÄ JOTTA HOMMA VIEDÄÄ MAALIIN

Mene riville 4558, ja tarkista puut, jotka tn. näkyvät 2012 laserilla.

Mene riville 5001, jatka riville 13548

Mene riville 14605 ja tee loppuun.

Suhtaudu Pehkusuon muutoksiin epäillen.

Varo, jos et tee mallia F4:lla, saat tiedostoon edellisen mittauksen (F4) arvot. Restoren painaminen pitää muistaa.

Tee ohjelmaan parannus, joka huomioi puulle jo annetun huomion, ja pitää sen mukana ehdotuksessa (Save). Reija huolehti tästä käsin jo tehtyjen rivien osalta.

Tahti on noin 100 puuta tunnissa eli jäljellä on tarkastustyötä noin kolmeksi viikoksi.