

A QGIS Plugin for optimized cable road layout planning

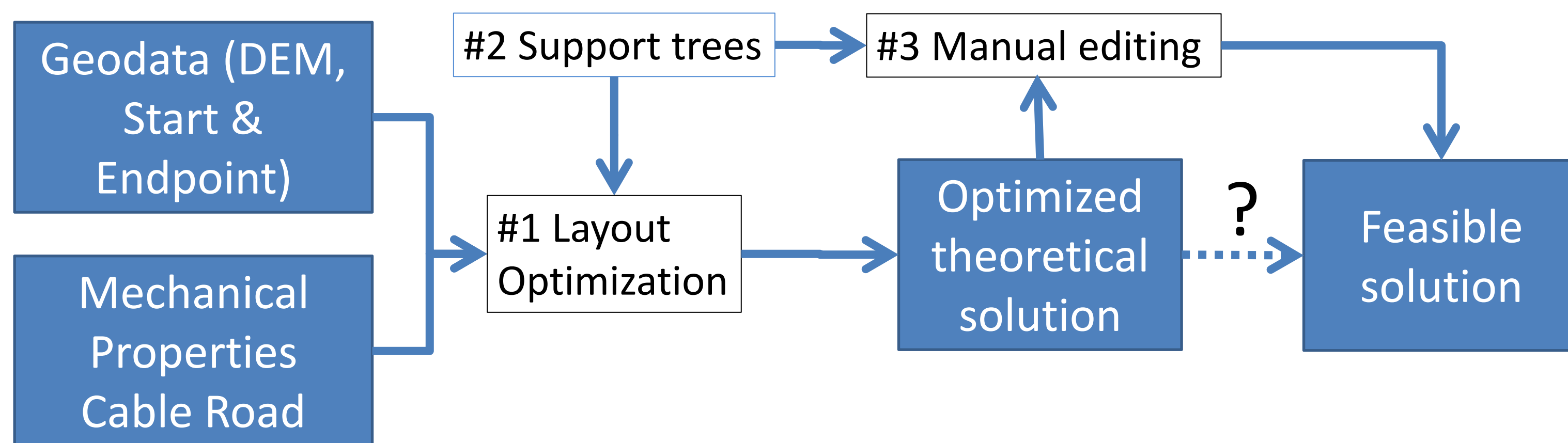
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Context / Problem

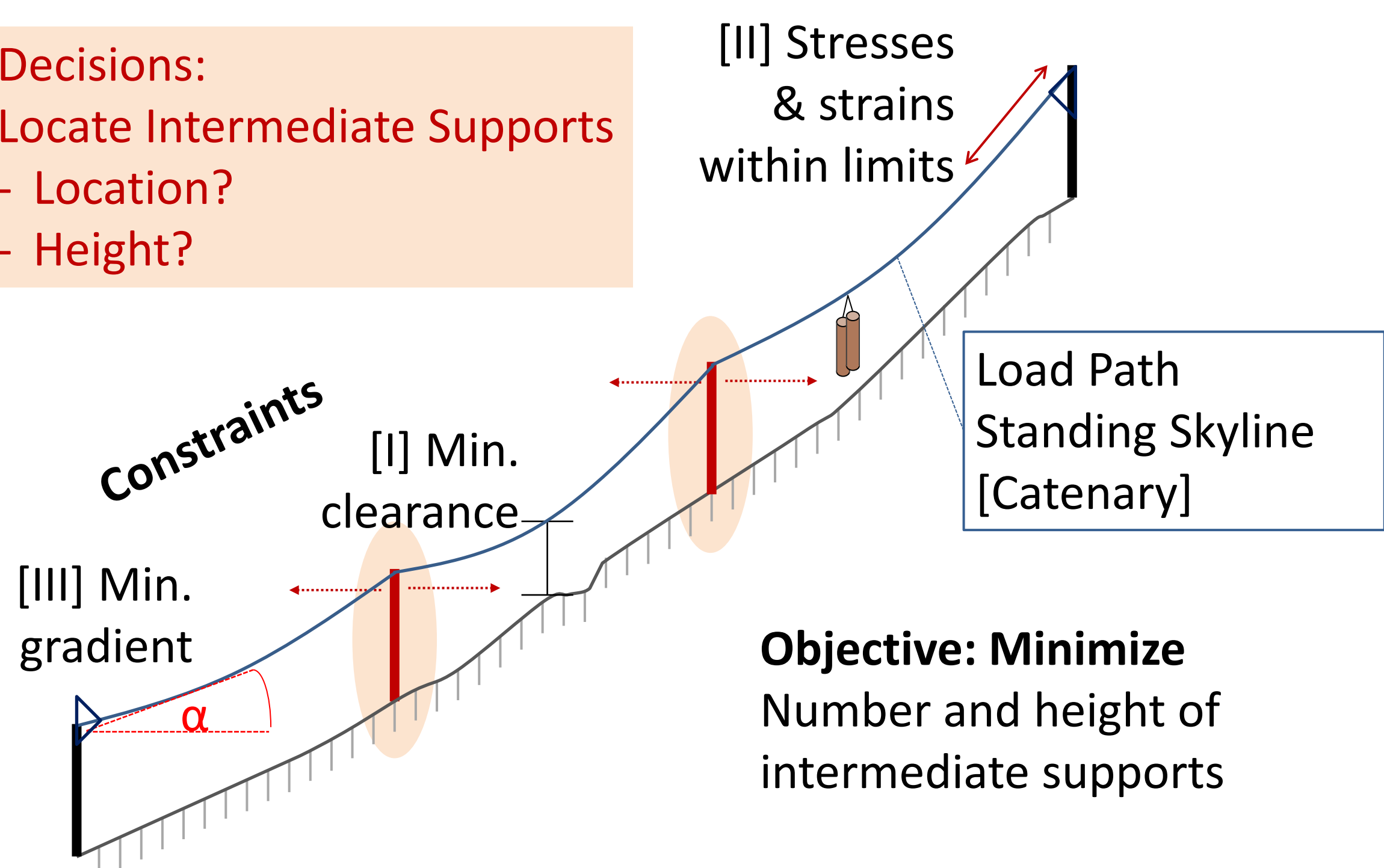
- Planning of a cable road is a complex task
- Available planning tools do not fulfil the requirements of the practice (wrong or unknown method to compute skyline properties / not integrated in a GIS / do not optimize the solution)
- Solution may not be feasible as not matched with existing trees (for supports)
- **Our solution:** User friendly QGIS plugin (Open source), based on catenary, containing an optimization algorithm and with detection of anchor and support trees

Workflow in QGIS



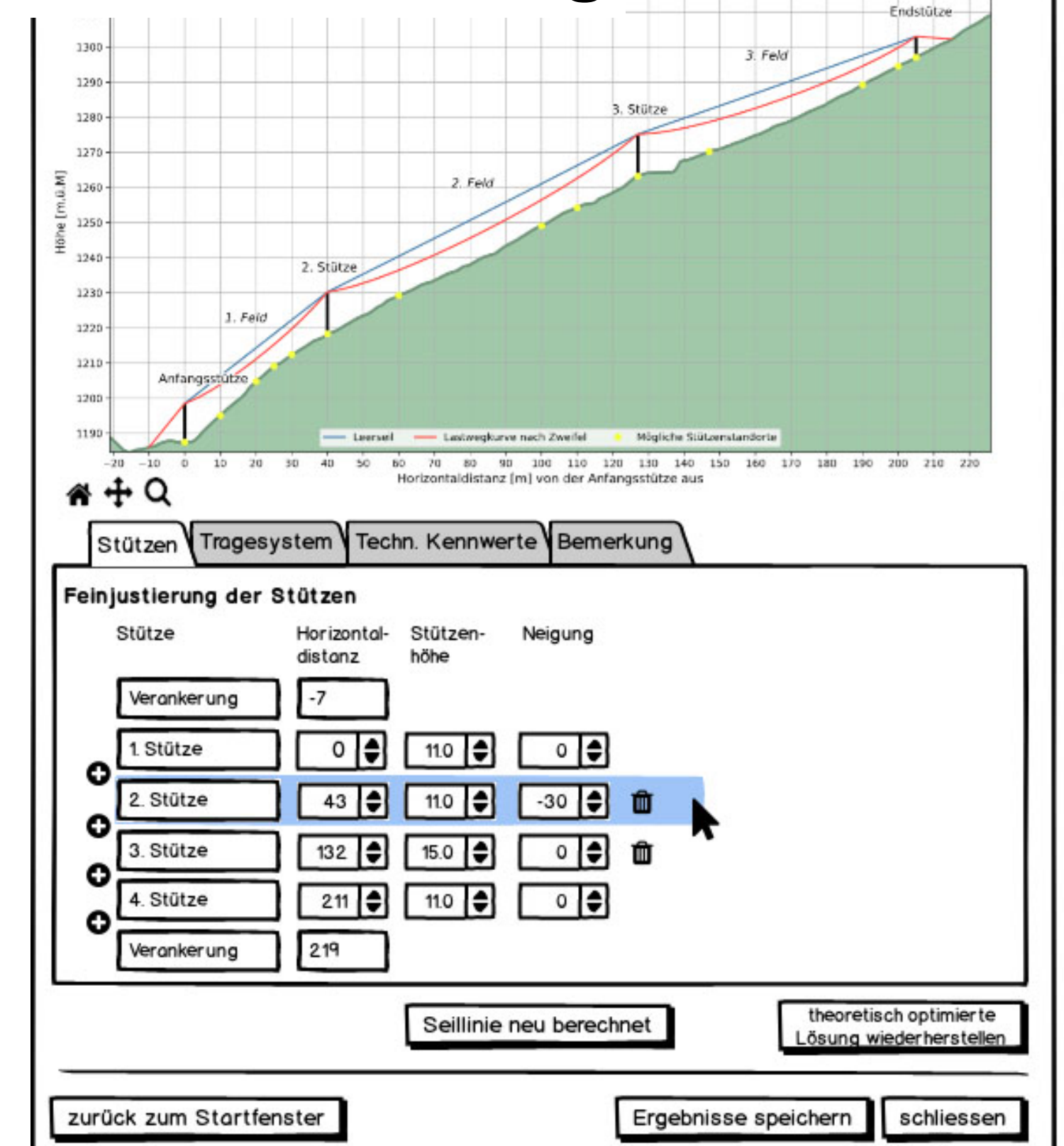
#1 Optimize cable road layout

Decisions:
Locate Intermediate Supports
- Location?
- Height?



[Bont and Heinimann 2012]

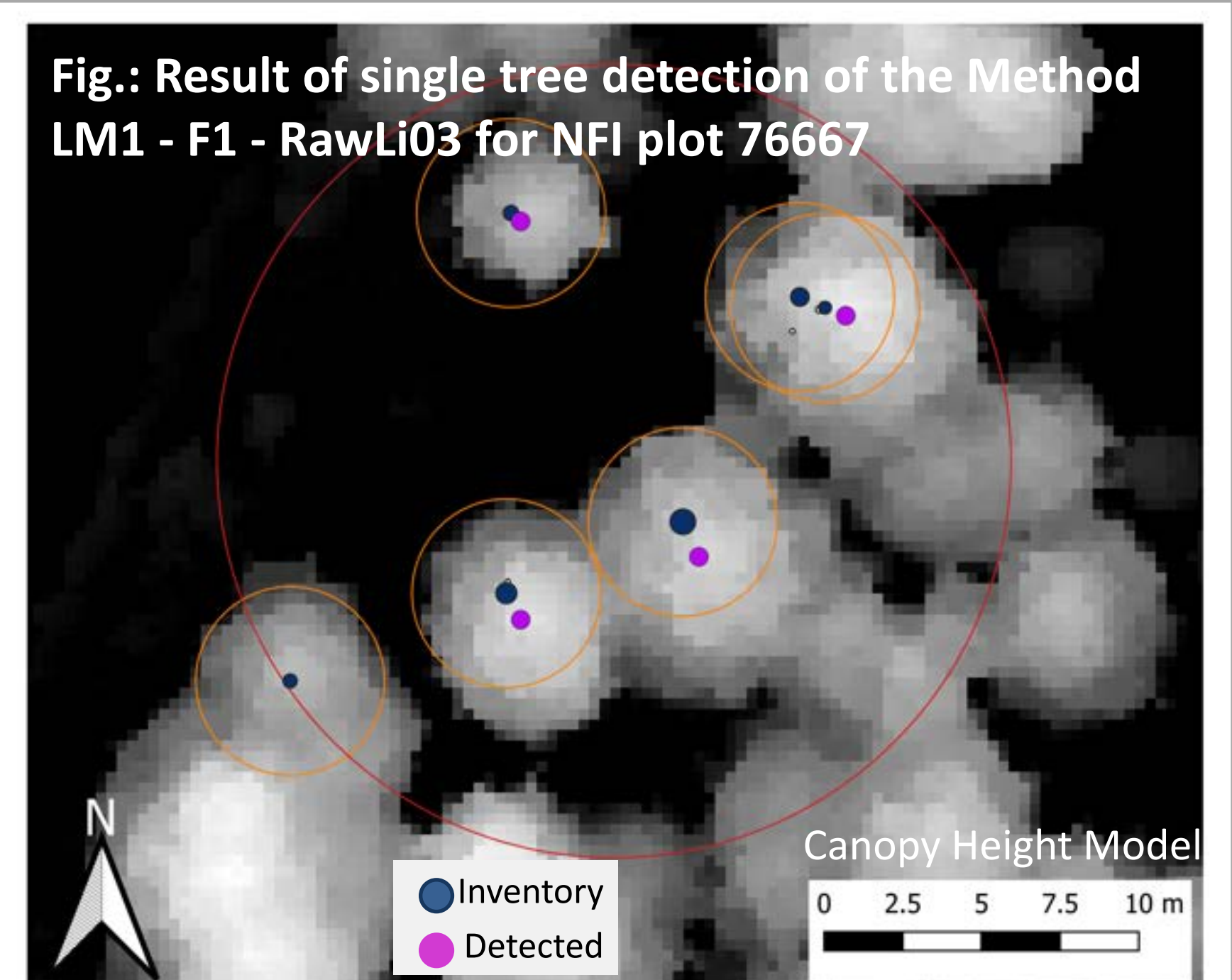
#3 Manual Editing



#2 Identifying support and anchor trees from remote sensing data

- Objective: Predicting Tree Height and DBH from available Remote Sensing data
- 72 method combinations were evaluated (3 Types of CHM x 8 Filter Methods x 3 Tree detection algorithms)
- Best results were achieved based on ALS Data - resolution dependent Gauss Filter - local maxima tree detection algorithm
- Tree position and tree height of the correctly detected trees show useful accuracies for cable line planning.

Fig.: Result of single tree detection of the Method LM1 - F1 - RawLi03 for NFI plot 76667



Conclusions & Outlook

- Simplifies Cable Road planning & more efficient solutions
- Prototype currently under evaluation
- Ability for manual editing remains necessary