

The Use of LSP with Satellite or Aerial Super High Resolution Imagery to Project and Track Stand Development

Forest Ecosystem Science Co-op
Science Day
April 4, 2007

Project Objectives

- It should be possible to use high resolution imagery and individual tree crown (ITC) techniques to determine density (stems per ha) and other tree attributes (i.e DBH, height, species).
- This information will be used to determine more precise yields based on values derived from the analysis of managed forest stands with height diameter models and density management diagrams.

Project Description

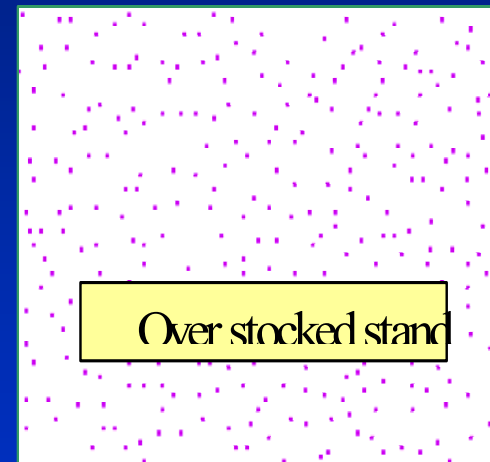
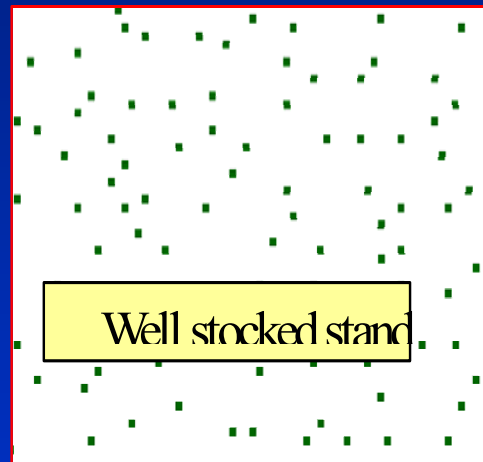
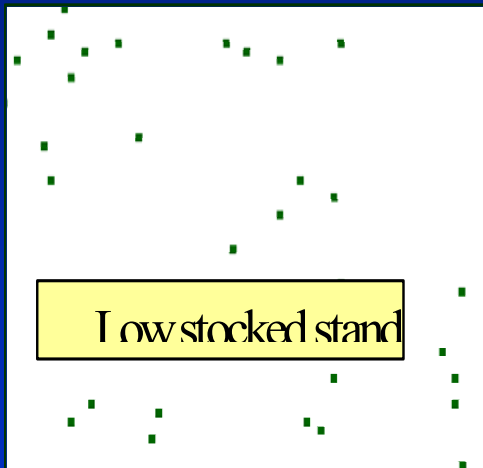
This project involves:

- Push broom digital imagery would be used to create the inventory (40-60 cm resolution);
- Applied to stands over 2 metres tall
- Field sampling of regenerating areas, including plantations and thinned stands to determine base data;

Project Description – cont'd

- Large Scale Photography (LSP) would then be used to develop SPP, ES, SC, density, ITC equations;
- LIDAR or IFSAR data to accurately measure height for development of site indices;
- Inventory value applied to SDMD and other algorithms to predict what “managed curve” the stand is developing on.

Examples of different stocking levels for regenerating stands



Source: Bowater-MNR Pilot Project

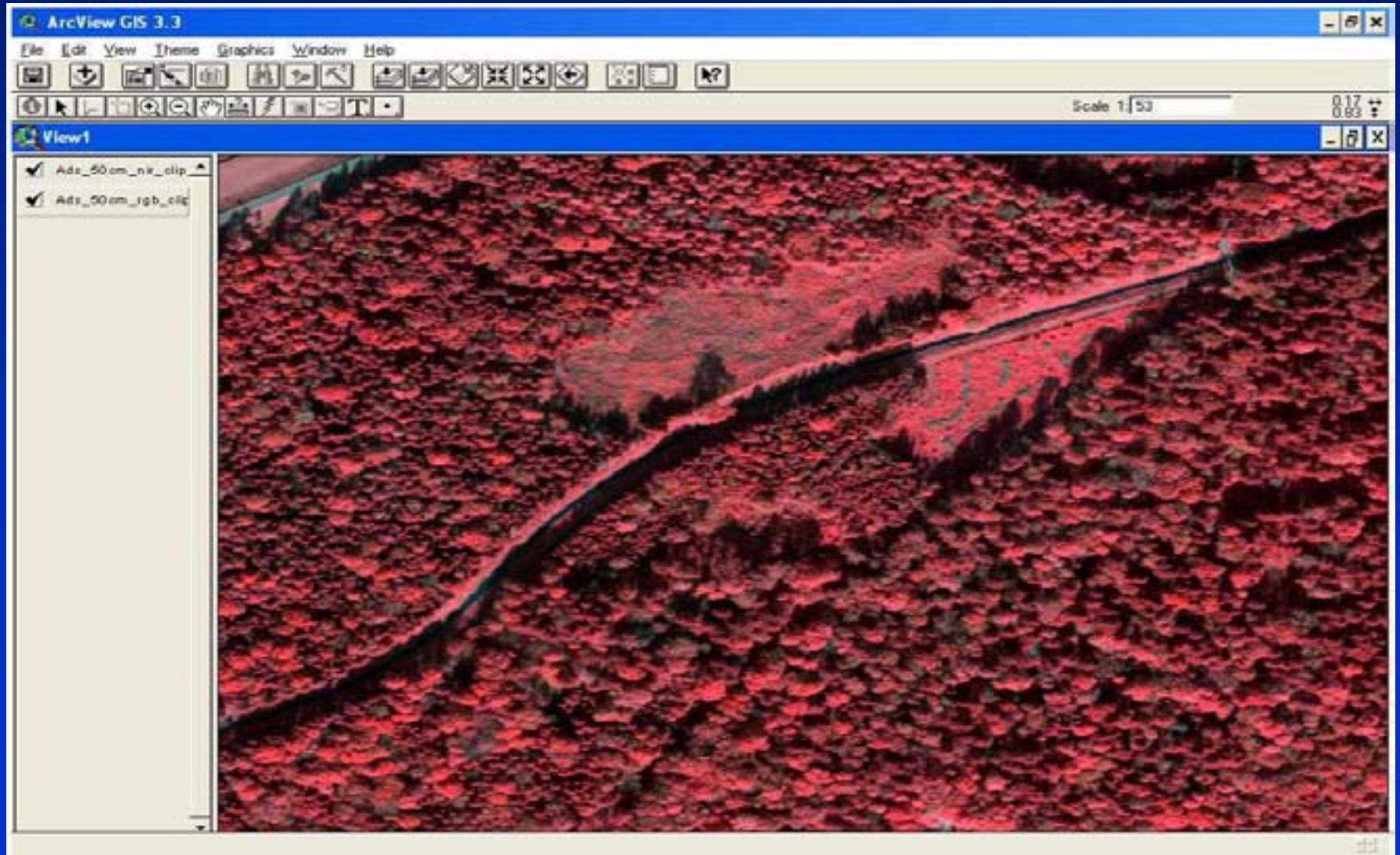
Other uses

- Identify stands that need remediation (e.g. fill plant or thin) to achieve the desired density or commercial thinning opportunities
- Identify the species composition of the block to aid in planning competition control
- Statistically valid effectiveness monitoring can be developed in a cost effective manner
- Early stand development information

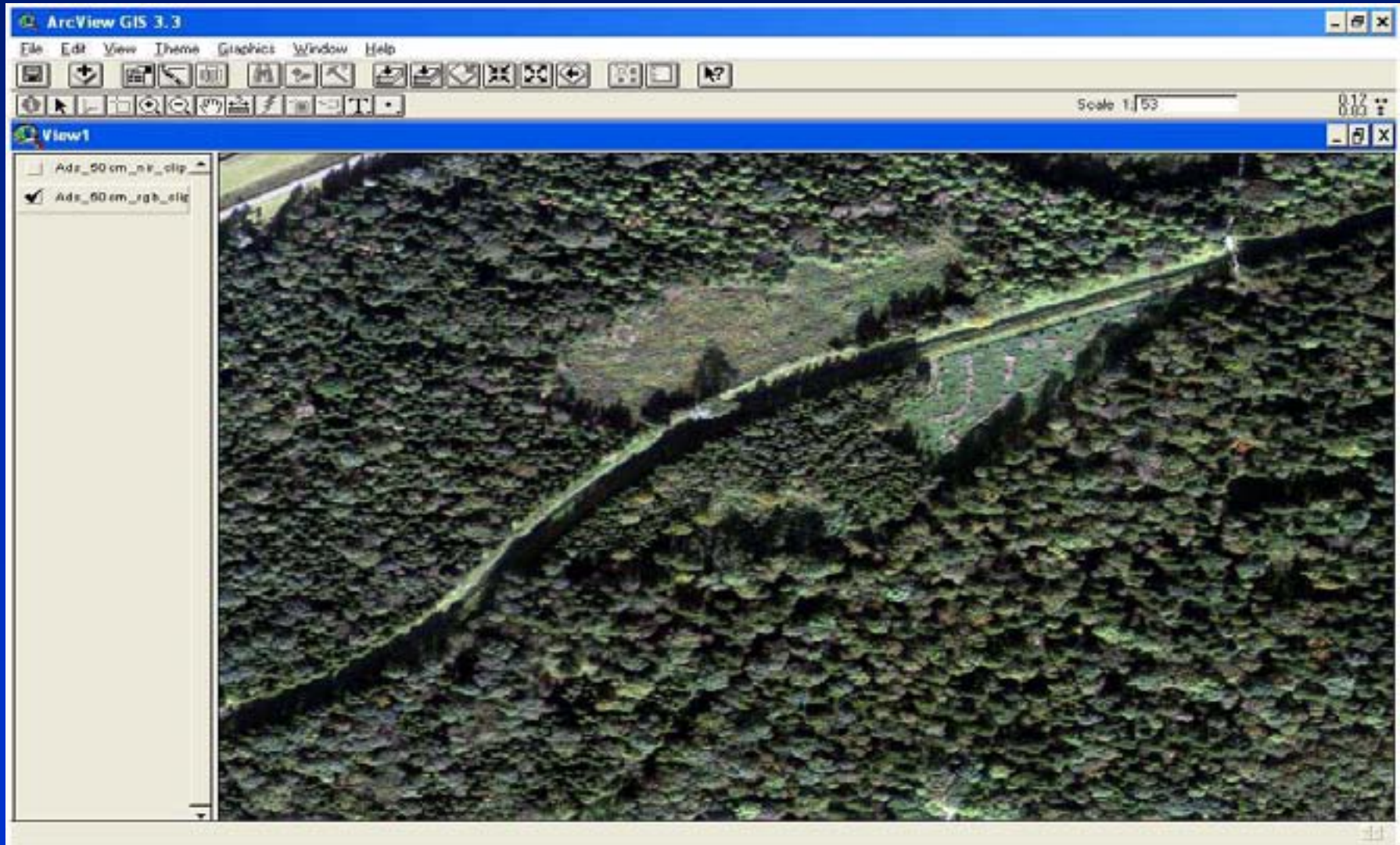
Progress to Date

- Task 1 - Digital Imagery Capture & Ortho to Legacy DEM
- Task 2 - Digital Imagery Mosaics in Pan, Color & False Color
- Task 3 – Photo Plots with LSP
- Task 4 - Eco-region Tree Crown DBH/BA Regression
- Task 5 - Delineate ITCs & TTs as Bitmaps
- Task 6 – Develop Stand Density Management Information

NIR sample



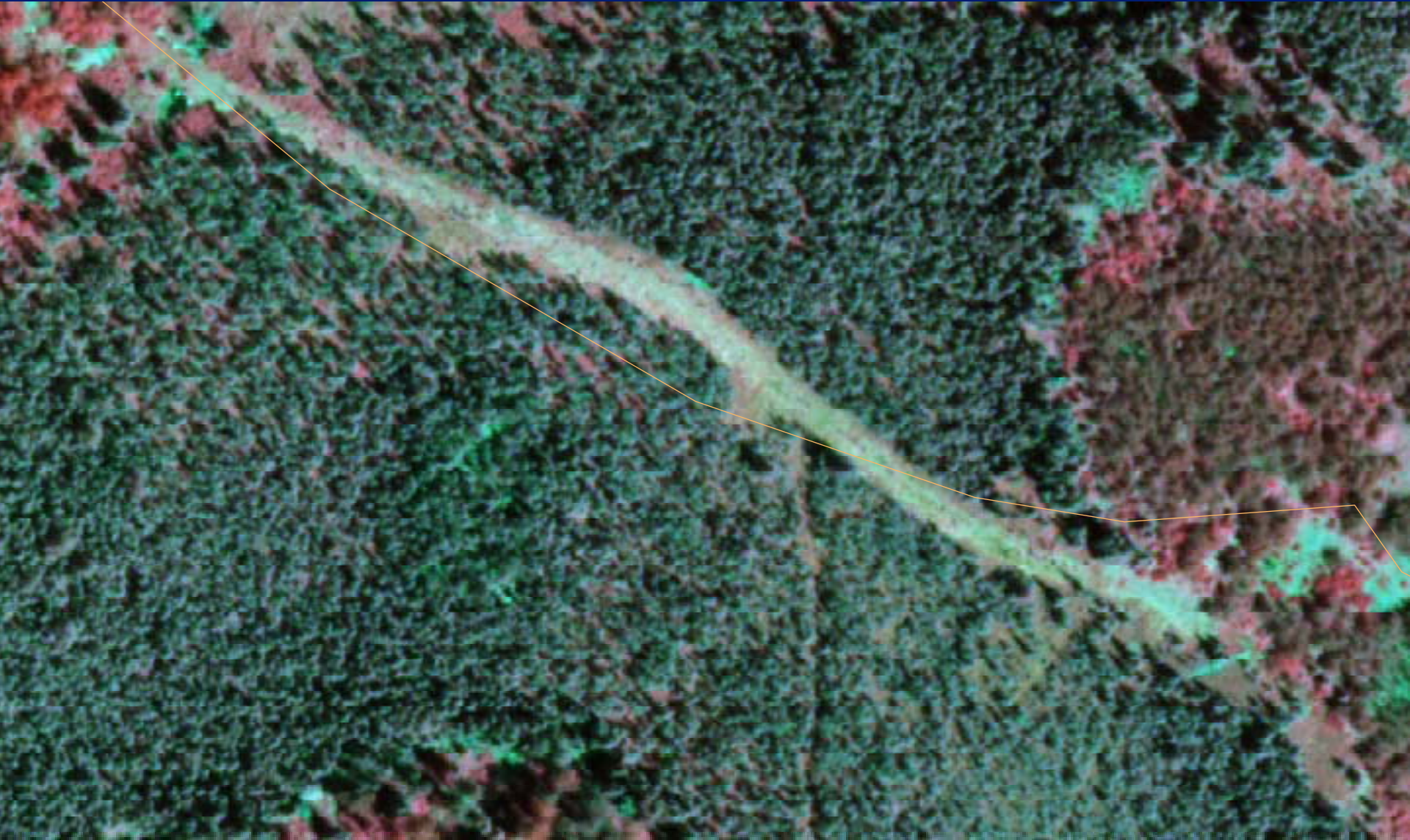
Colour Sample

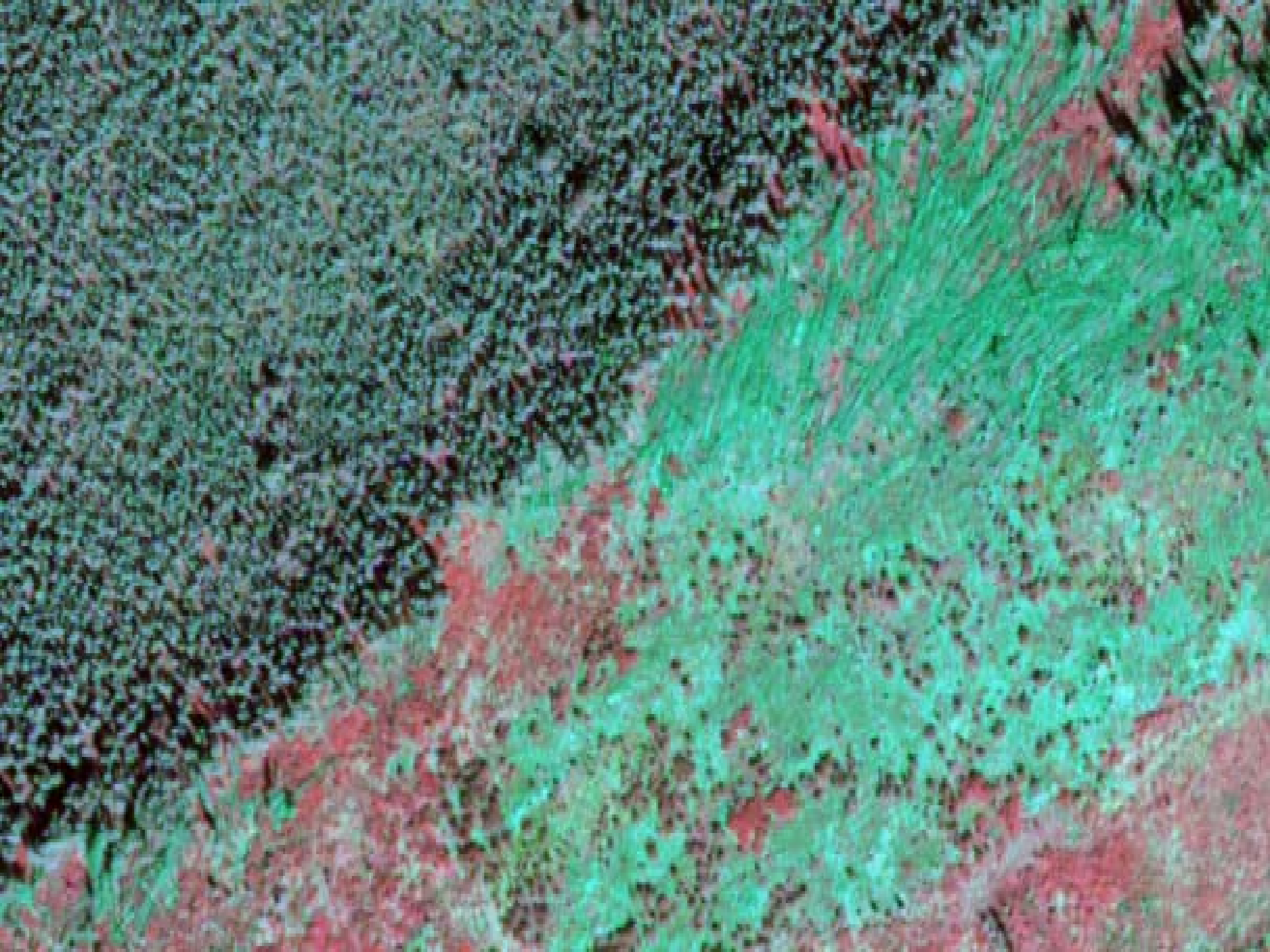


False Colour Sample



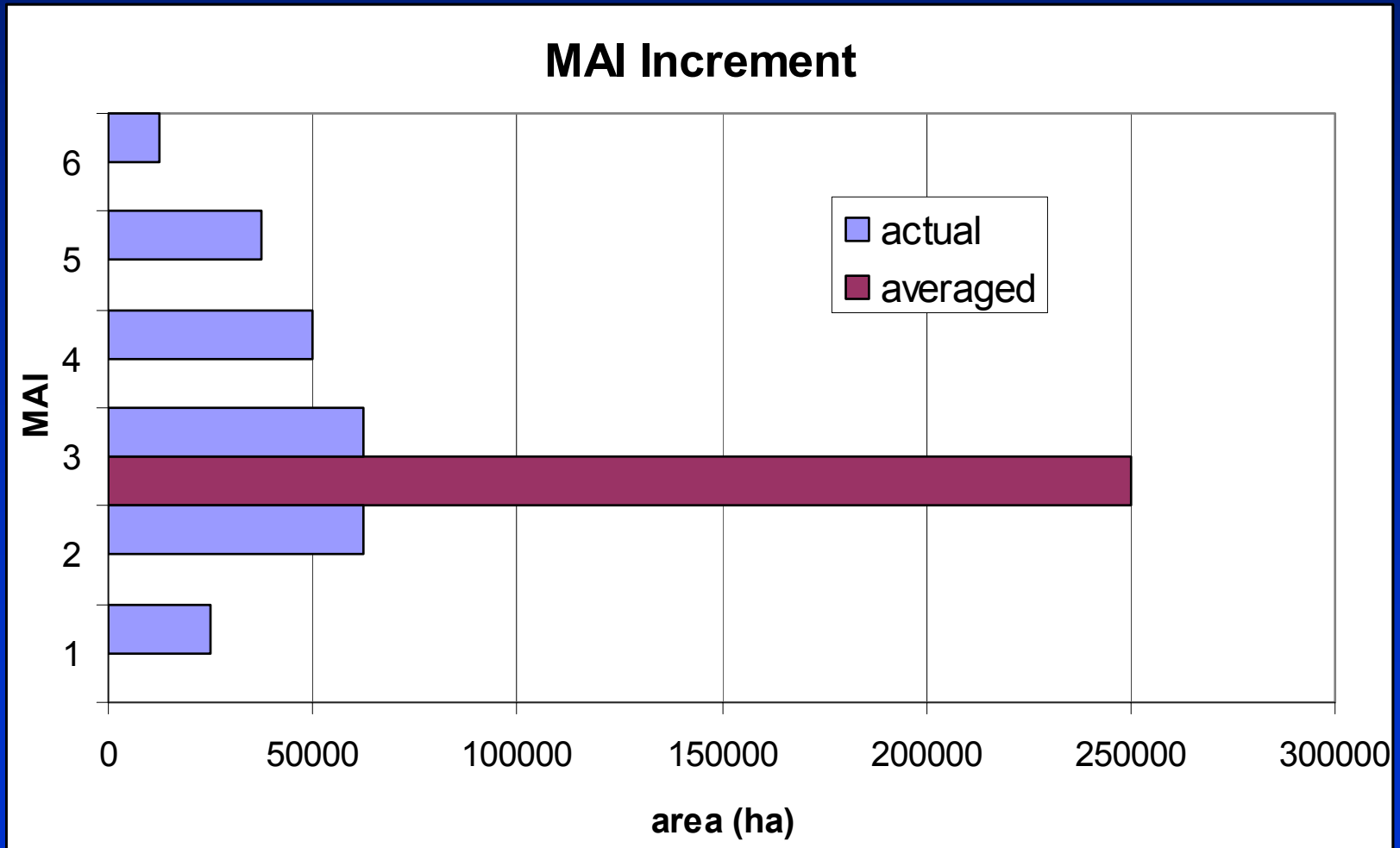
Young Pj Sample





Special Thanks to Forestry
Futures Trust Fund

Compare Actual MAI's vs. Averages Used in Wood Supply Modelling



Impact on Management

- More accurate forest classification and yield predictions from the enhanced inventory should lessen the dependency on averaged (conservative) growth models.

