Enhancing Productivity in Southern Forests

An industry perspective

What we are about…

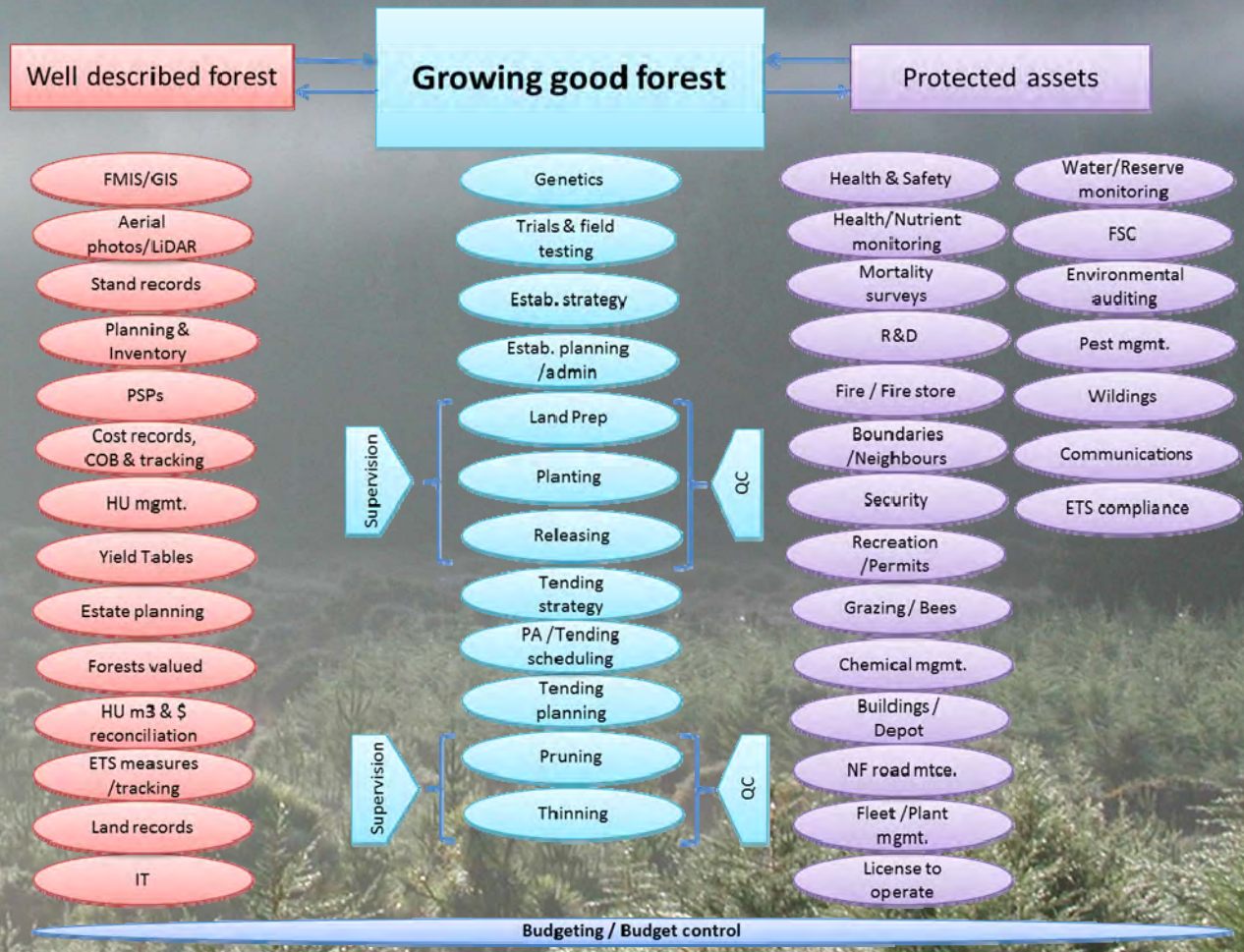
- A brief history of City Forests

- City Forests' core functions today:

  - To optimise the economic return from the Company's activities for the long-term benefit of the Company's Shareholder.
  - To manage the forest asset and other resources in such a way as to ensure their long-term economic, social and environmental sustainability.

- The Forest Assets' section's core role in the delivery of the company's functions is to maximise the productive potential of the company's land in order to provide a fit for purpose and sustainably managed forest resource.

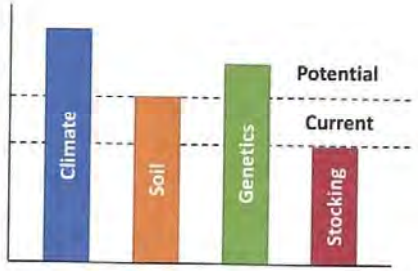
It's complicated…



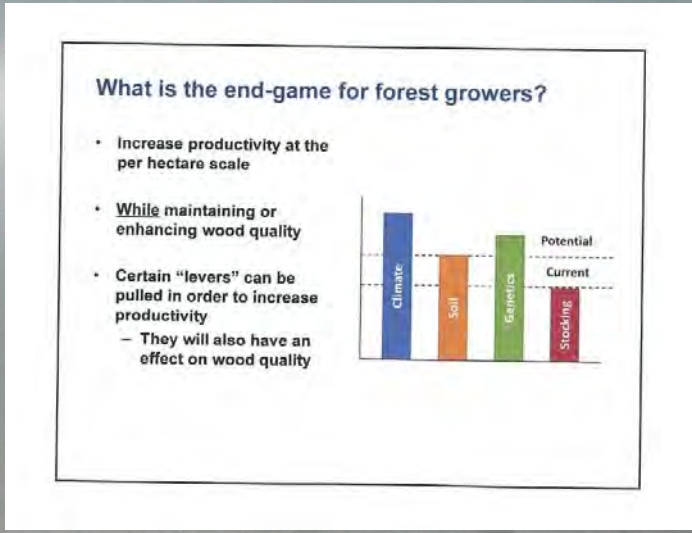
Sources of productivity… for the researcher

What is the end-game for forest growers?

- Increase productivity at the per hectare scale
- <u>While</u> maintaining or enhancing wood quality
- Certain "levers" can be pulled in order to increase productivity
  - They will also have an effect on wood quality



Sources of productivity… for the forester



All of this plus…

- Getting the right tree on the right site
- Effective establishment – no holes
- Utilising the PPA
- Minimising fallow ground
- Balancing harvesting constraints with physical productivity and market opportunity
- Balancing financial and physical potential and opportunity (they're not always the same!)

Sources of productivity… getting the right tree on the right site

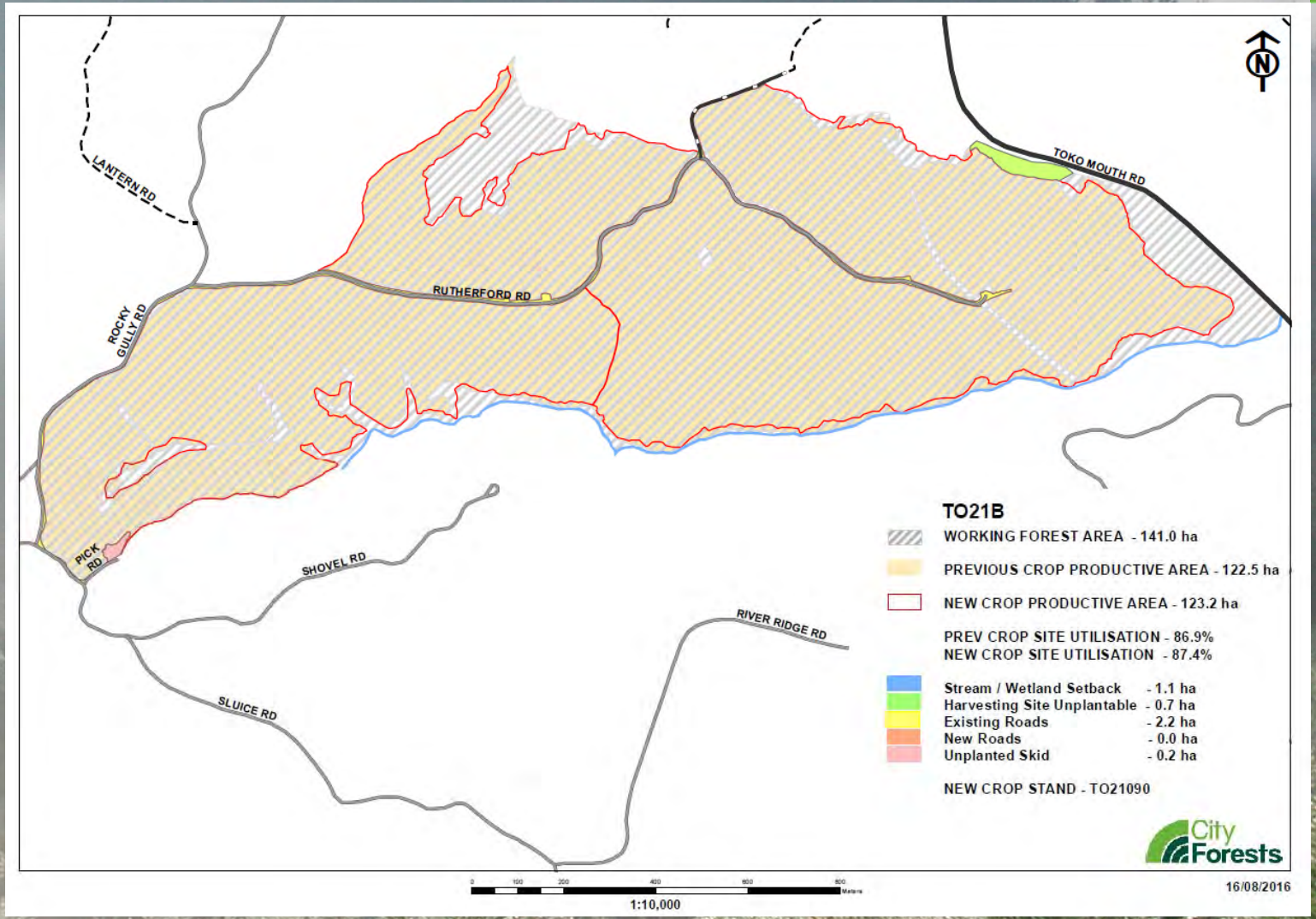
Hybrids growing at high altitude on an exposed site

Sources of productivity… good establishment is essential

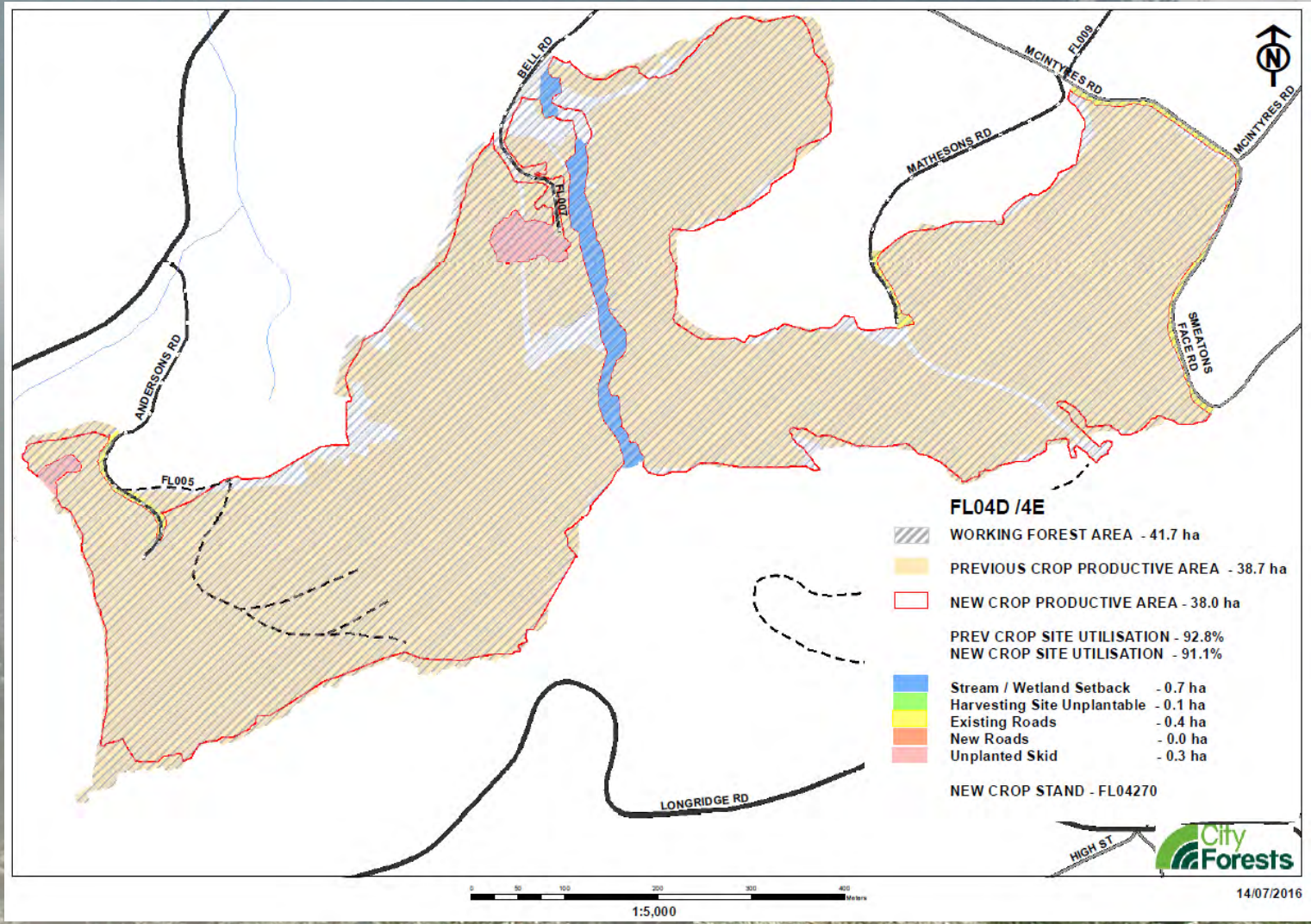
Sources of productivity… utilising the PPA

Planted estate changes		
OPENING PLANTED ESTATE (30 June 2015)		**15605.9**
Includes Amenity Species		**24.6**
Additions	Planting since 30 June 2015 (restocking and new planting)	**486.7**
Additions	Acquisitions	**155.9**
Adjustments	Mapping changes (& cutover unestablished)	**-28.5**
Deletions	Clearfelling (*enter as -ve*)	**-526.5**
CLOSING PLANTED ESTATE (30 June 2016)		**15693.5**
Includes Amenity Species		**33.7**
Valuation Area (excludes Amenity)		**15659.8**
Reconciliation with Area database (including productive unstocked)		**16469.2**
Difference = productive unstocked		**775.7**
Area Reconciliation at period end		
CLOSING LAND AREA		**20463.6**
CLOSING PLANTED ESTATE		**15693.5**
	Land awaiting restocking	**751.8**
	Land Bank	**23.9**
	Unproductive area	**3994.4**
Summary Statistics		
Projected fully stocked estate (ha)		**16469.2**
% land holdings unstockable		**20%**

Sources of productivity… utilising the PPA



Sources of productivity… utilising the PPA



Sources of productivity… minimising fallow ground

Sources of productivity… optimising the harvesting decision

Sources of productivity… balancing financial vs physical potential

Making use of the research

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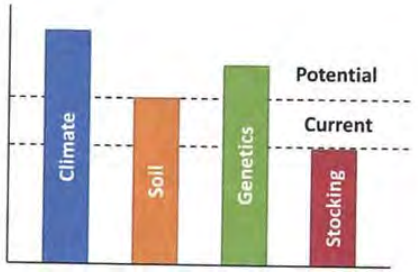
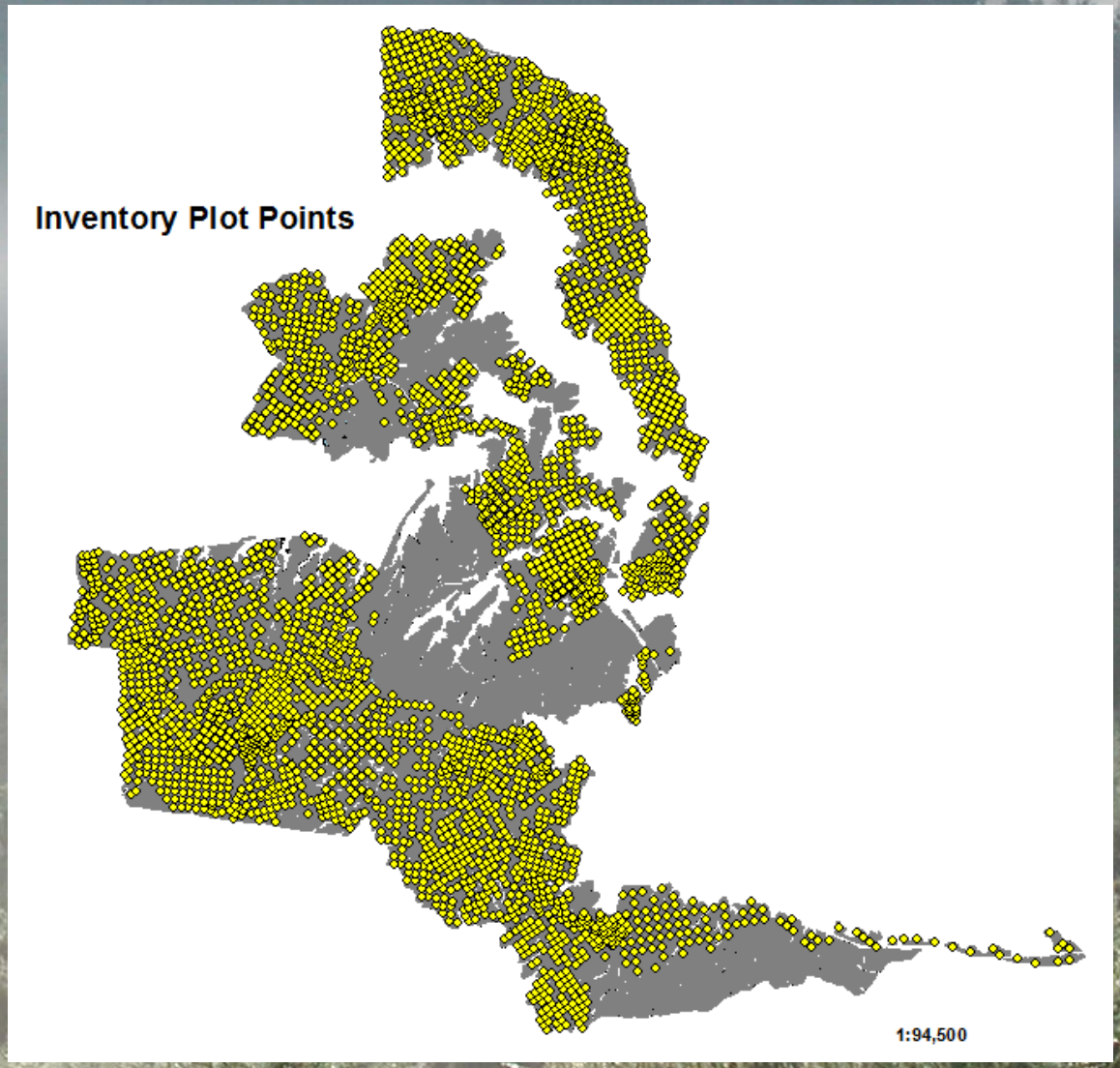
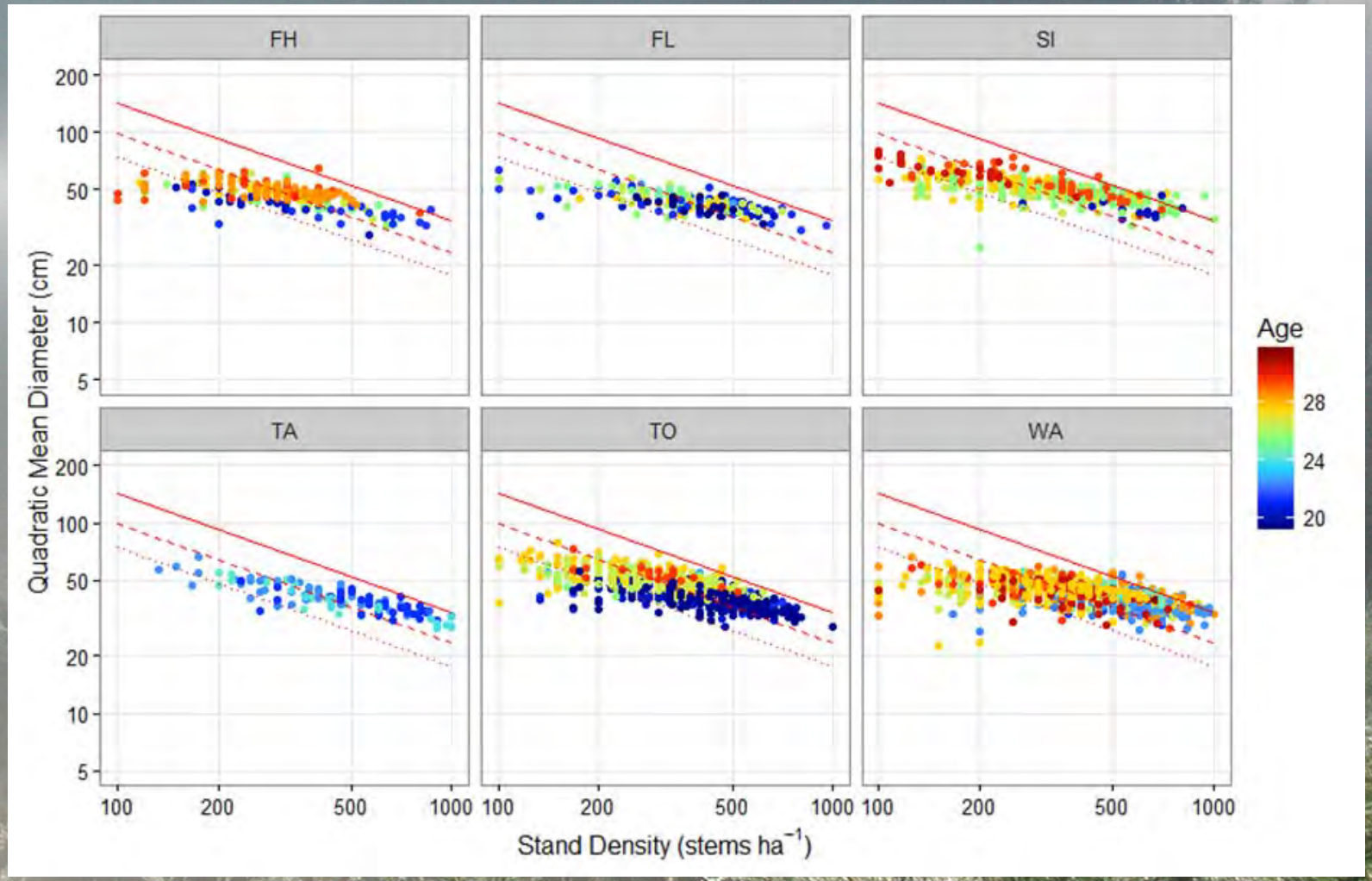


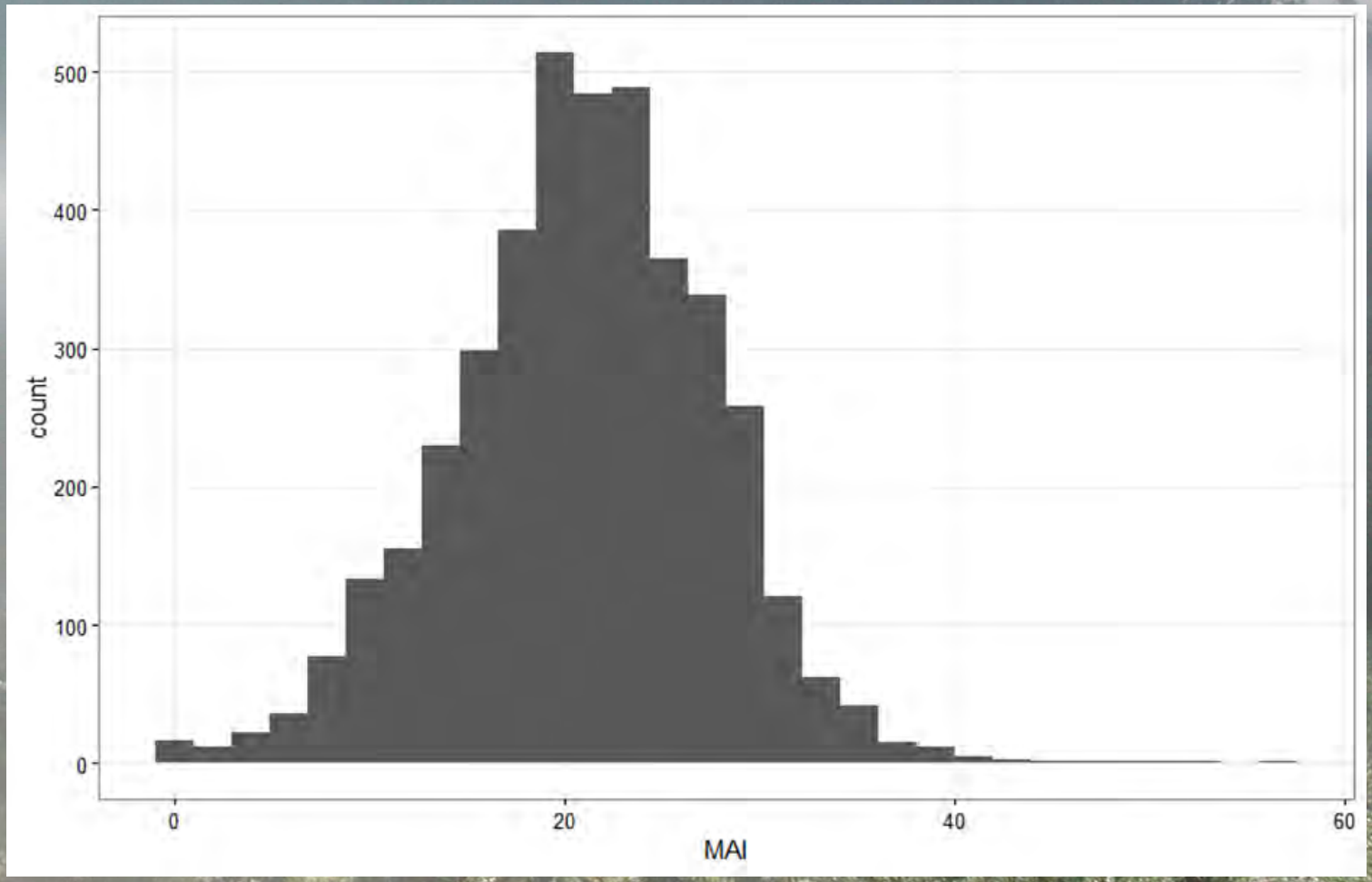
Making use of the research with existing Inventory data



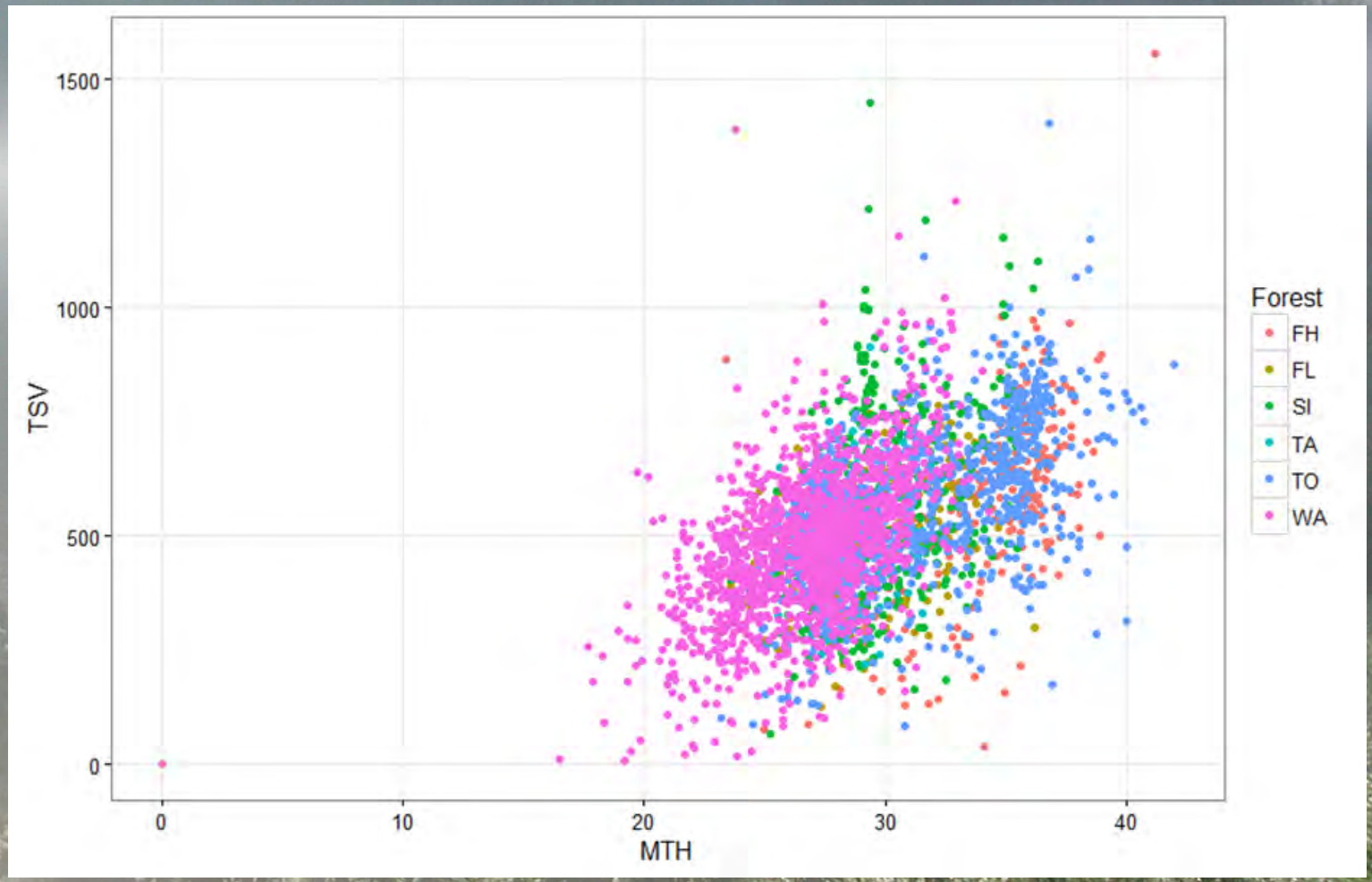
Assessing Stand Density Indexes



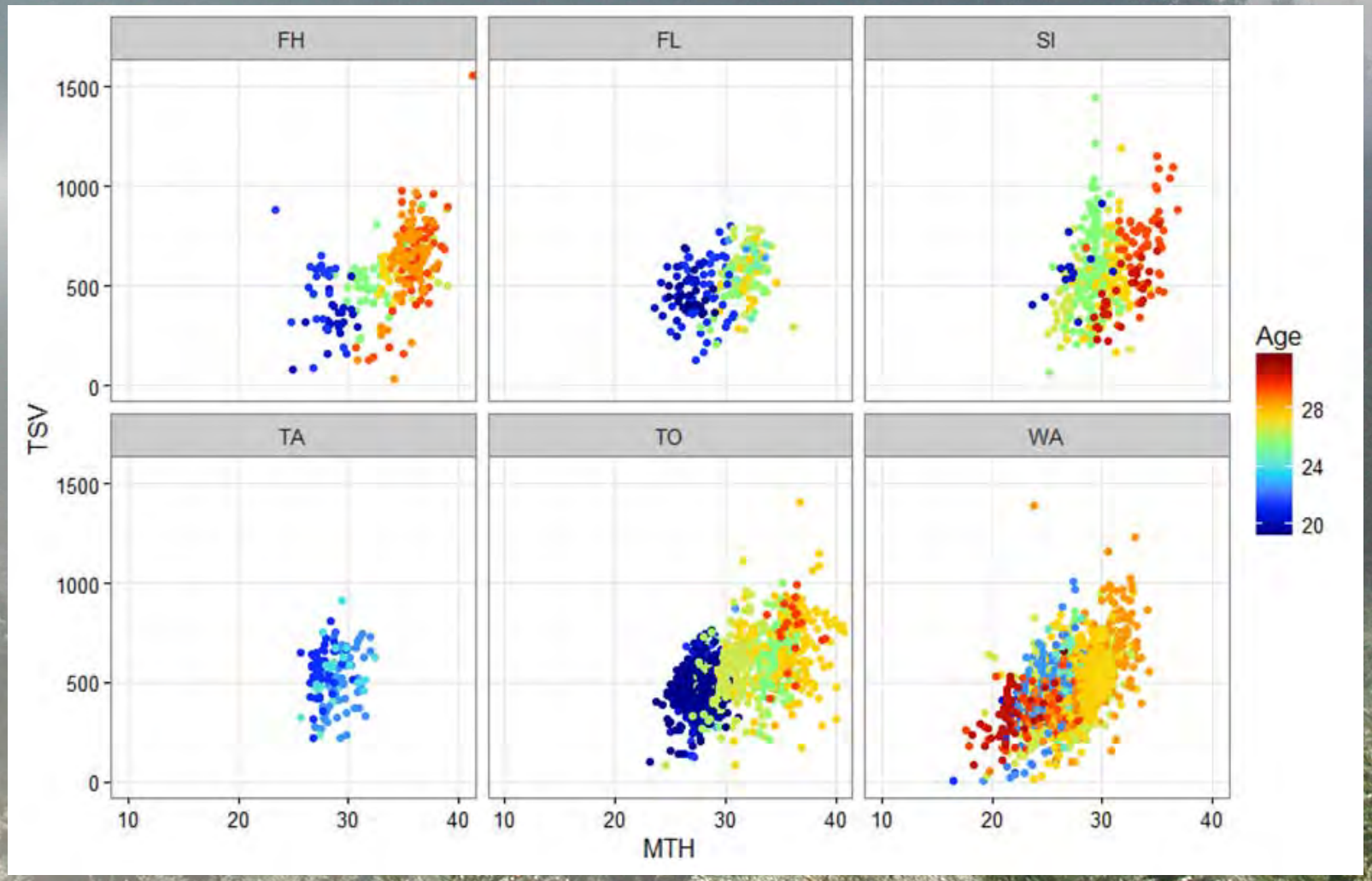
Calculating average MAI



Total Stem Volume vs Height – all Forests



Total Stem Volume vs Height – by Forest



Total Stem Volume vs Height at 600m+

39 year old radiata (Hybrids growing to right)

41 year old radiata at an exposed site

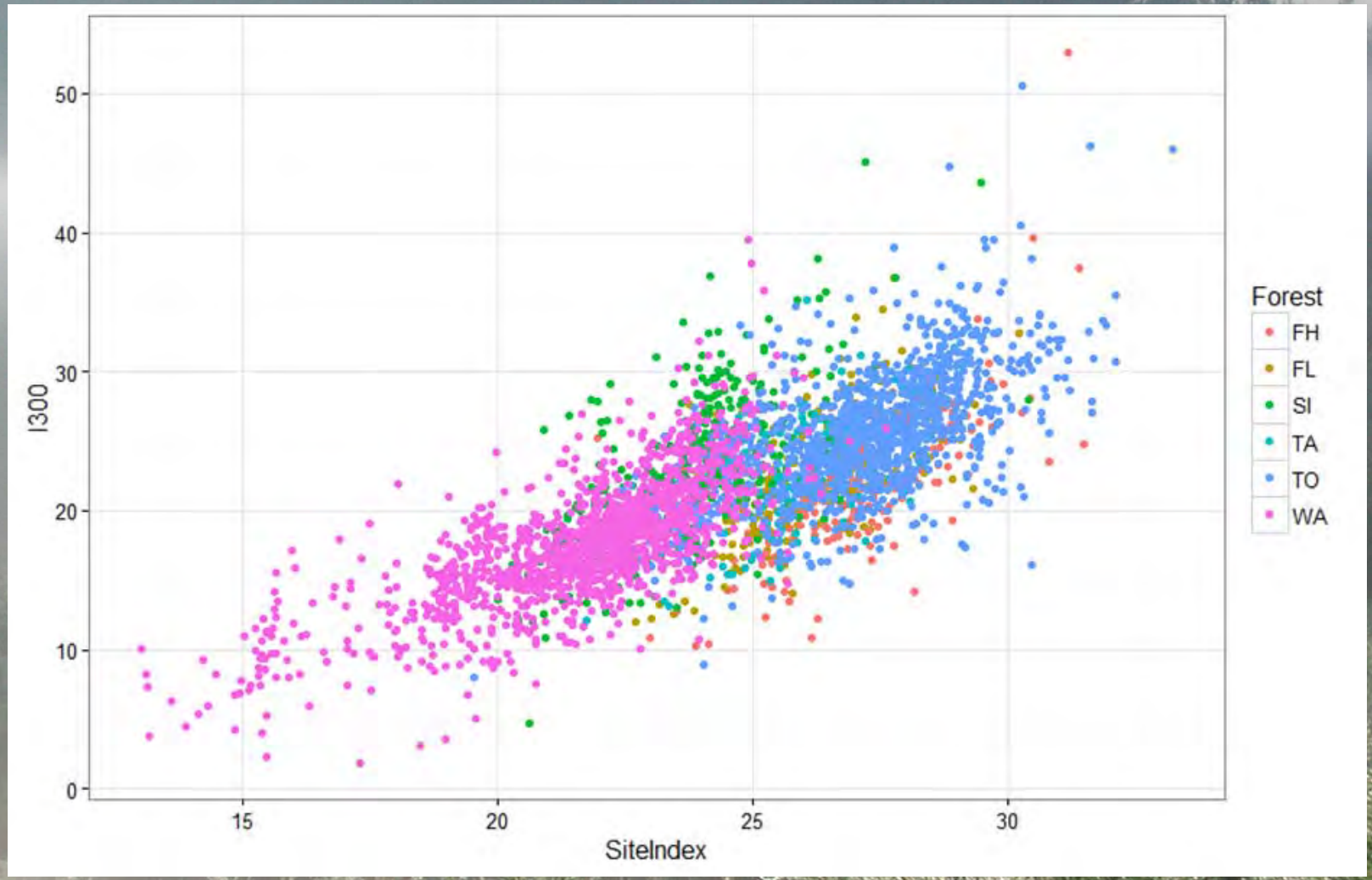
A large “E” factor

Total Stem Volume vs Height at 150m

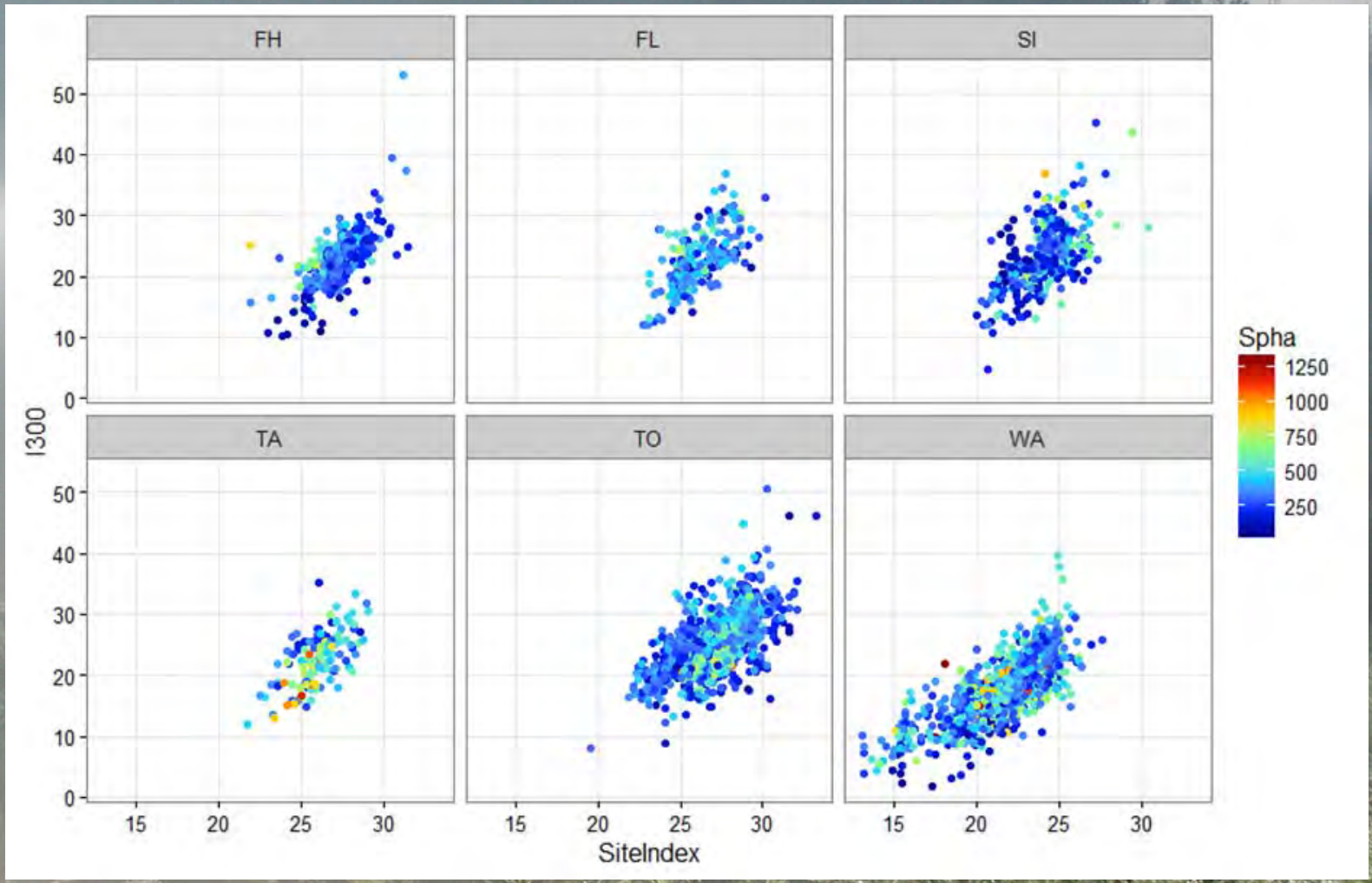
28 year old radiata

A best practices trial on a highly productive site

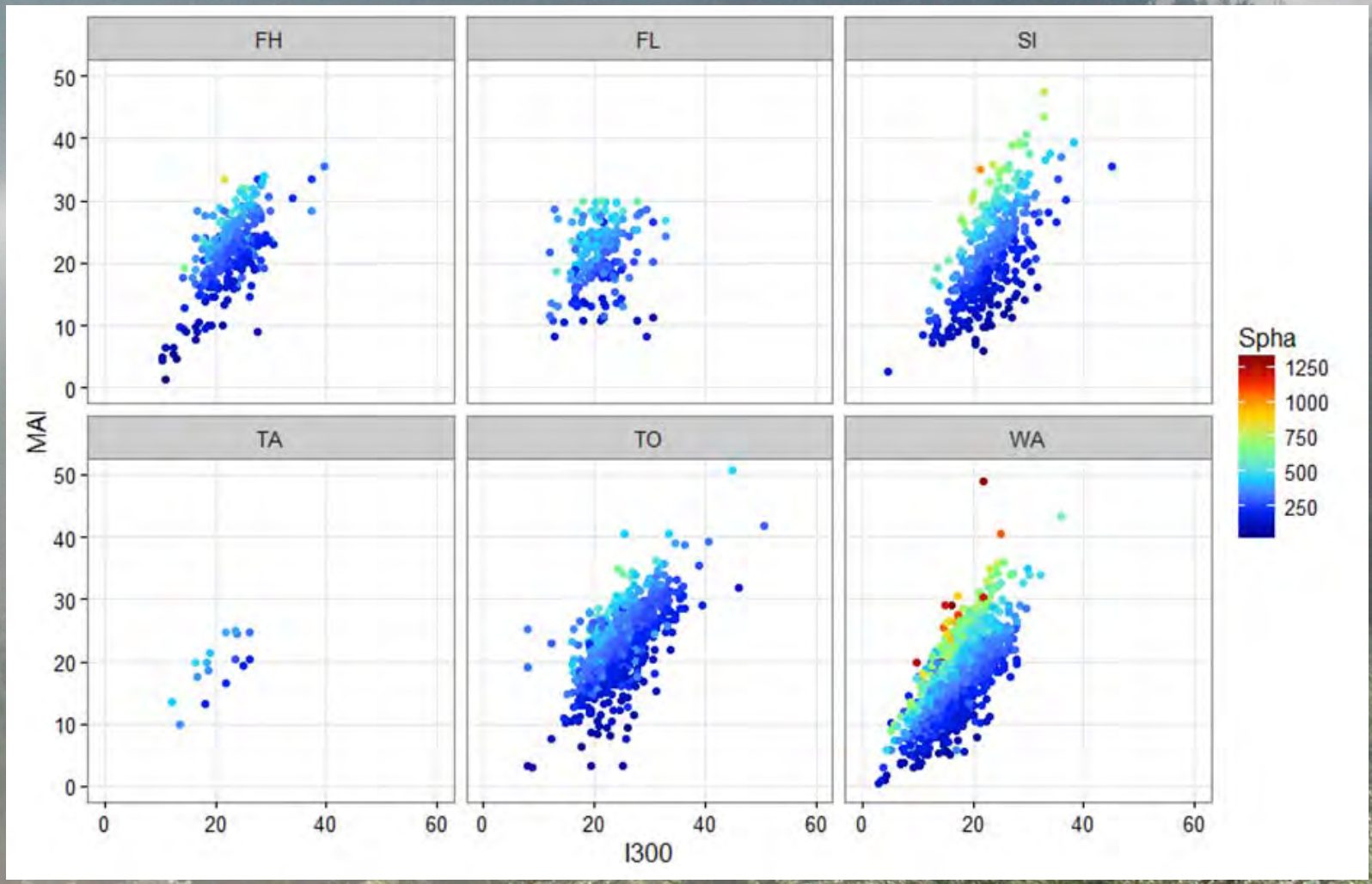
300 Index vs Site Index – all Forests



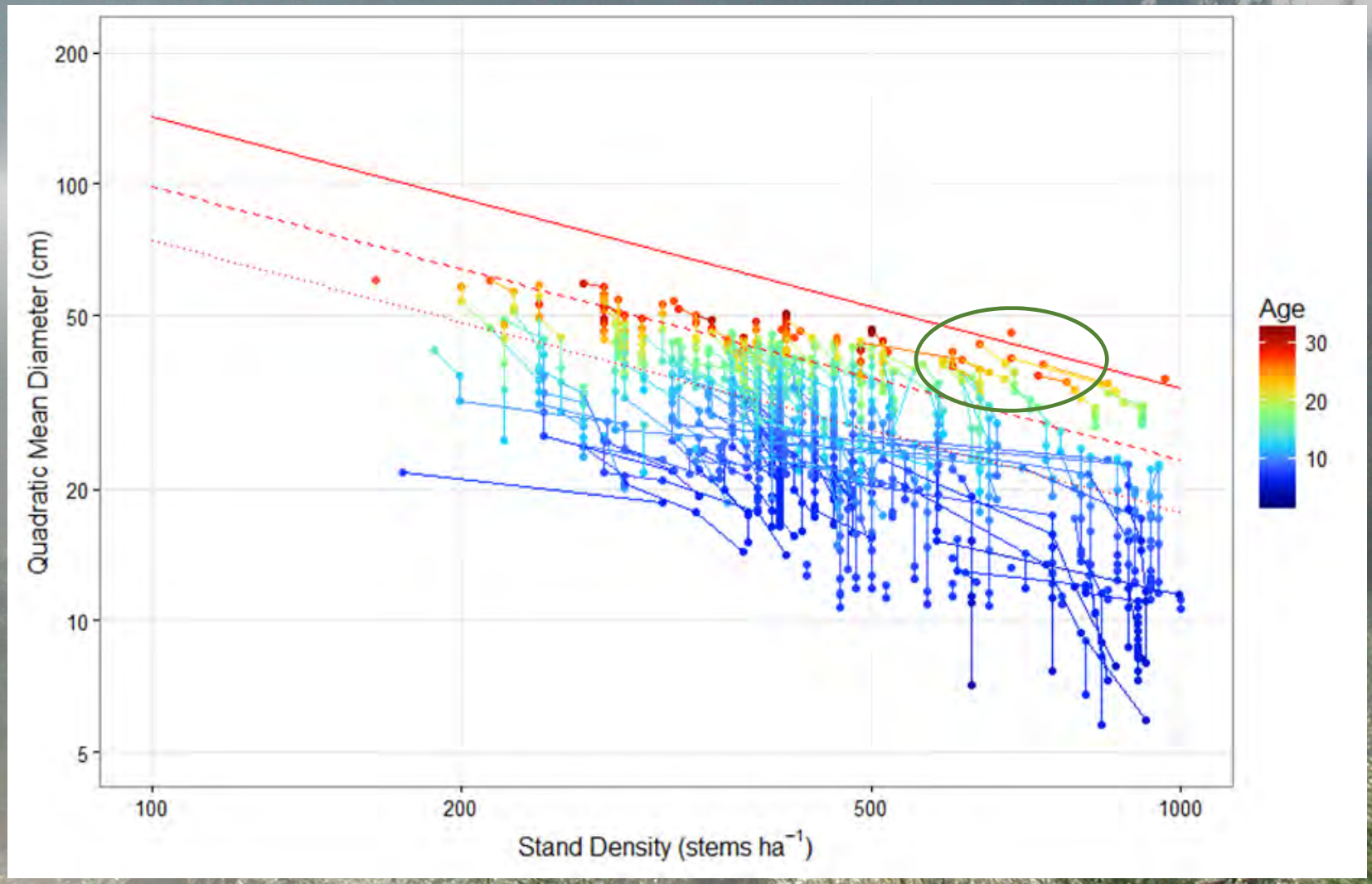
300 Index vs Site Index – by Forest



MAI vs 300 Index - by Forest



Density Management Analysis using PSP data



In summary…

There are critical productivity decision points at various stages of our forest growing process:

1. Planning of site preparation activity
2. Selection of species to plant
3. Selection of genetics
4. Selection of stock types
5. Selection of tending regimes
6. Assessing the potential for future crop acceleration activities
7. Getting the when and where to harvest decision right, within other constraints