

Land Valuation in Land Consolidation

experiences from Sweden

Mats Backman

LANTMÄTERIET

2011-06-15

1

The role of valuation

- *voluntary Land Consolidation*
- *compulsory Land Consolidation*

- ♦ Voluntary Land Consolidation
 - ♦ Values agreed by parties – no valuation needed
- ♦ Compulsory Land Consolidation
 - ♦ Valuation necessary for the compensation order
 - ♦ The compensation order has also to be in accordance with the property formation act

LANTMÄTERIET

2011-06-15

2

Importance of valuation for the participating landowners

Land Consolidation often affects a major part of a landowner's fortune – regardless of if it is a voluntary or compulsory Land Consolidation.

Requirements of valuation

- Accurate, reliable and trust-worthy



2011-06-15

3

The influence of land use on valuation

Fundamental precondition

- The land use which gives the highest value has to be applied.



2011-06-15

4

Which factors influence the value of arable land?

- Type of crop and market prices
- Fertility/yield
- Drainage
- Access to roads
- Size and design of parcels
- Agricultural properties – market situation

2011-06-15

5

LANTMÄTERIET

Field inventory of arable land

Factors which need field inventory

- Type and condition of soil – sand, moraine
- Fertility
- Drainage
- Possible obstacles e.g. electric transmission poles, big rocks, ditches
- Size/design of parcel
- Access to roads

2011-06-15

6

LANTMÄTERIET

Valuation in Forest Land Consolidation

Valuation of forest land

- Photo-interpretation and laser scanning
- Supplementary field inventory
- Inspection by the owners
- Calculation of the value by the BM-method
- Forest properties → market situation

LANTMÄTERIET

2011-06-15

7

Which factors affect the value of forest land

- Amount of growing stock
- Diameter at breast height
- Tree species
- Long-term yield
- Age
- Timber quality
- Timber market
- Access to truck roads
- Topography
- Logging conditions
- Size and design of parcels
- Market situation for forest properties

LANTMÄTERIET

2011-06-15

8

Why laser scanning?

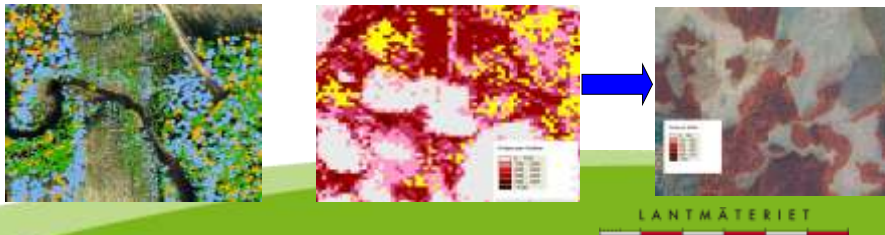
- Lower cost for inventory
- Larger areas accomplished with the same staff
- Avoid subjective valuations and variation between valuers
- Better accuracy for forest data

Data are produced for three levels - trees, squares (15*15 m) or aggregates to stands.

Single Tree®

ForestGrid™

Stand data



2011-06-15

9

Laser scanning - Single Tree® method

Every tree is enumerated!

- Single Tree® is a registered trade mark for FORAN
- The method was established in co-operation between SLU and FOI
- Further development of research-algorithms for application to commercial volumes
- Collects position and properties for the individual trees by pulse intensive laser



2011-06-15

10

Aerial photo interpretation

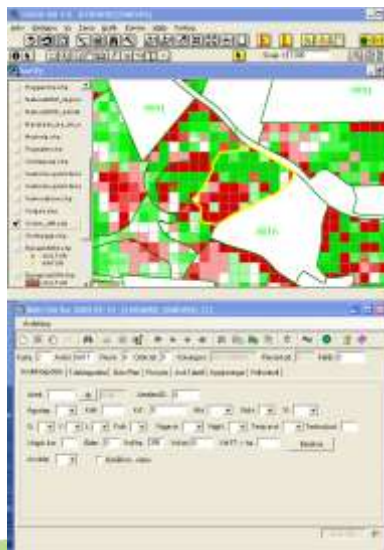


2011-06-15

11

LANTMÄTERIET

Forest Grid



Red squares = volume below the average

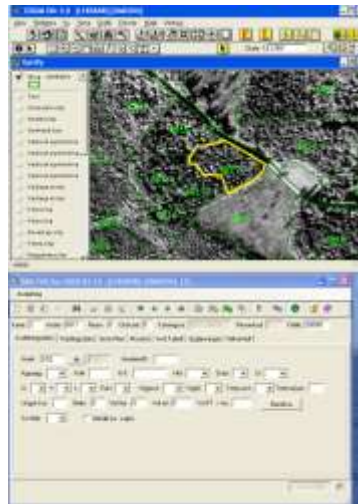
Green squares = volume higher than the average

2011-06-15

12

LANTMÄTERIET

Adjusted boundary for stand nr 6817



Result – more
homogenous stands
nr 6817 and 68171

2011-06-15

13

LANTMÄTERIET

Factors which need supplementary field inventory

- Age
- Long-term yield
- Timber quality
- Topography (occurrence of slopes)
- Logging conditions (drainage, occurrence of swamps and rocks)

2011-06-15

14

LANTMÄTERIET

Calculation of forest values

Valuation with the BM-method all relevant data are used

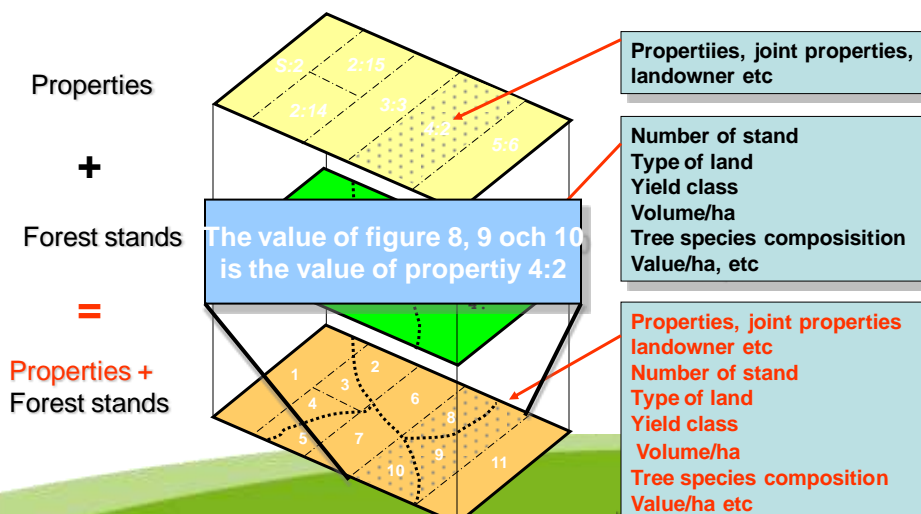
- Calculation of the yield value of each stand
- Aggregation of the values of stands to parcels and properties
- Comparison and possible adjustment to the current market values of forest properties with similar qualities or characteristics, mainly amount of growing stock per hectare

LANTMÄTERIET

2011-06-15

15

Swedish GIS application Overlay technique in forest valuation



2011-06-15

16

Characteristics of market information

Market values depend on

- Geographical region
- Length of vegetation period
- Possible crops, tree species
- Average yield value
- Available forest industries
- Demand of
 - Agricultural products
 - Meat
 - Forest products

LANTMÄTERIET