

Harvest of bioenergy wood and effects on wood living beetles

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Photo: Magnus Larsson



måndag den 16 maj 2011

- 4-6 m³ of dead wood/ha in managed forests
- 25 m³/ha of stump wood above ground on a clear cut
- ==> Stumps and logging residues constitutes a major part of the available breeding substrate in managed forests



- Is there a diverse saproxylic beetle fauna in bioenergy wood?

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I. Stumps compared with logs

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- Are certain types of wood more valuable than others?

3. Tree species /Diameter

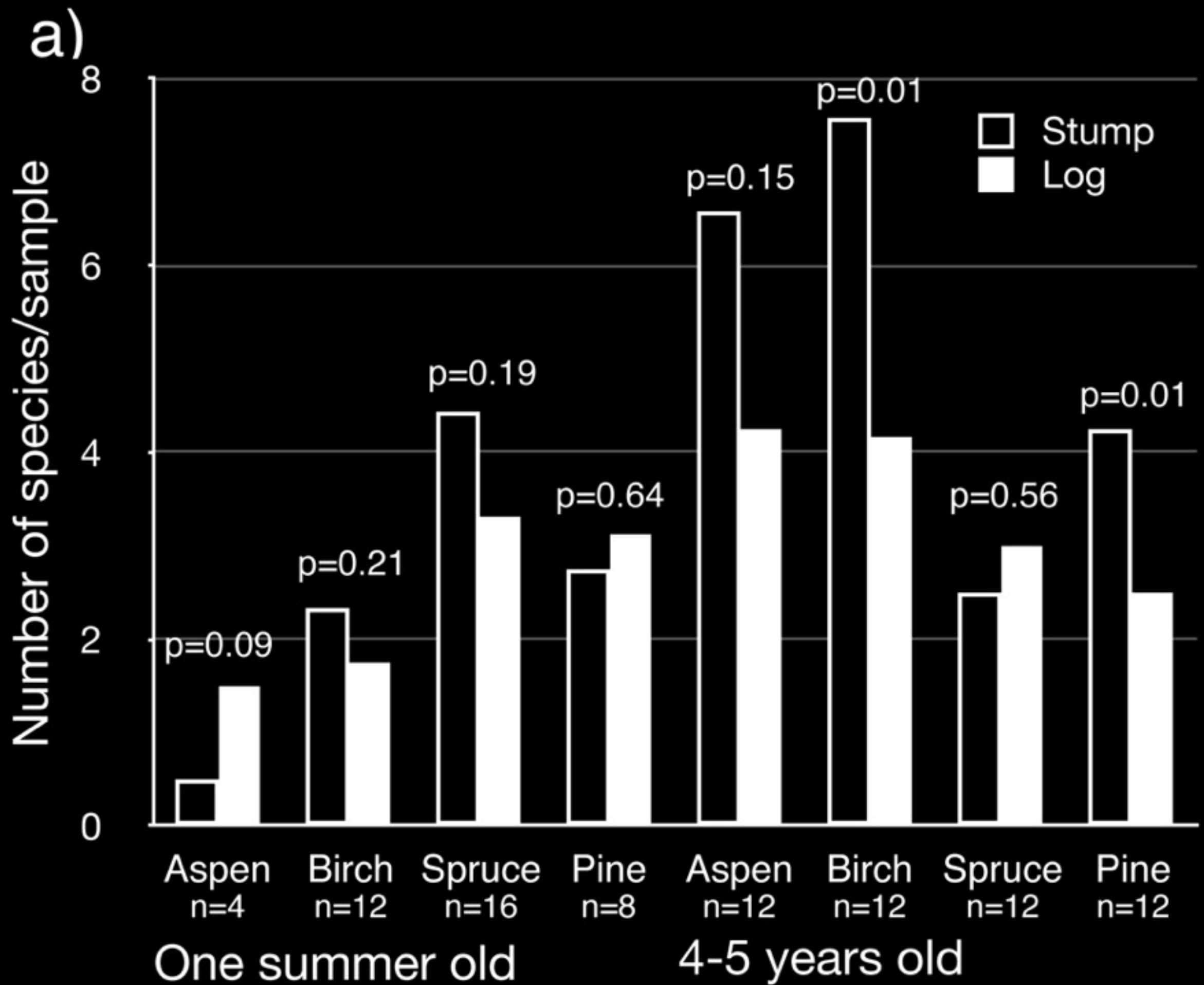
I . Stumps vs logs

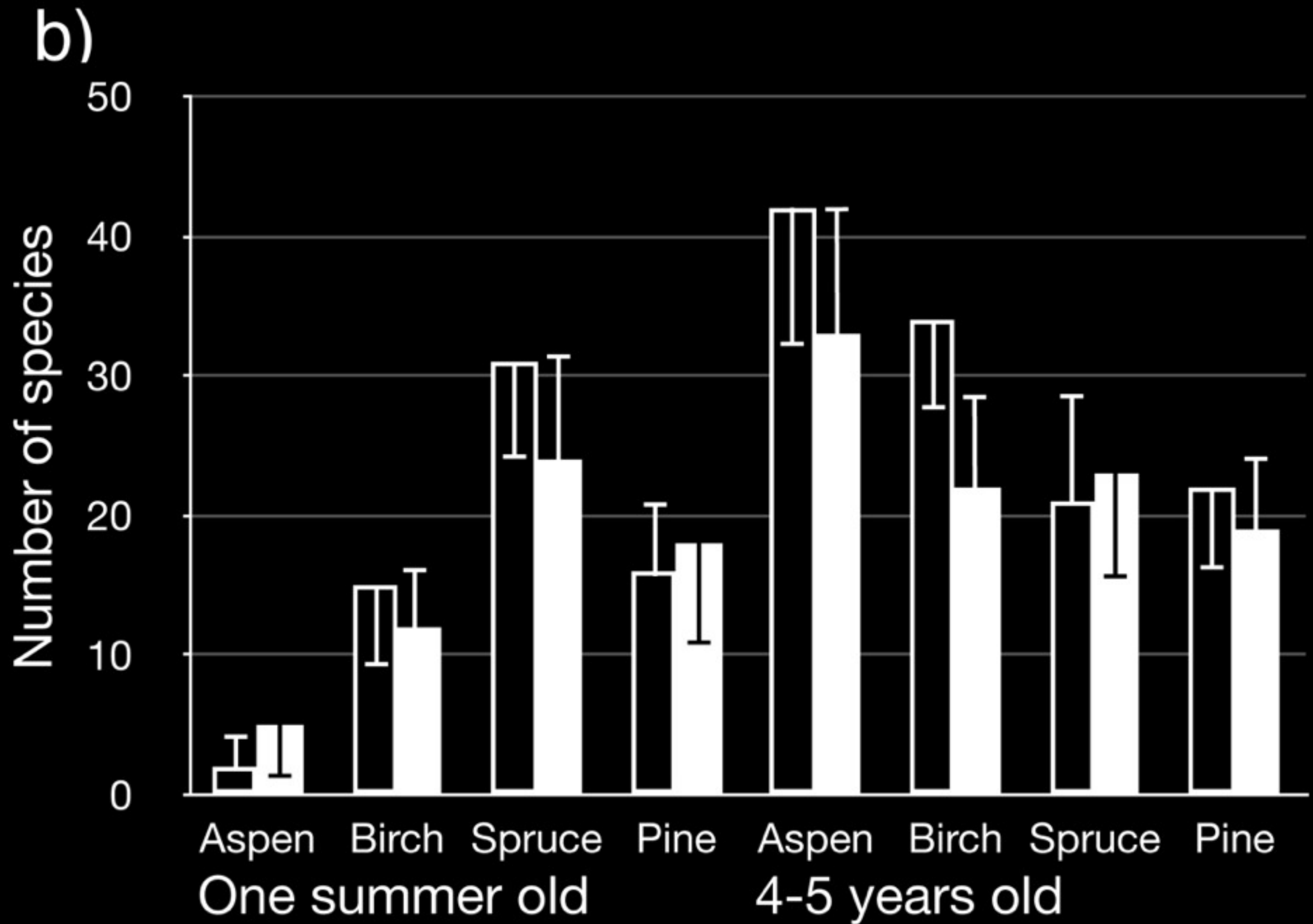




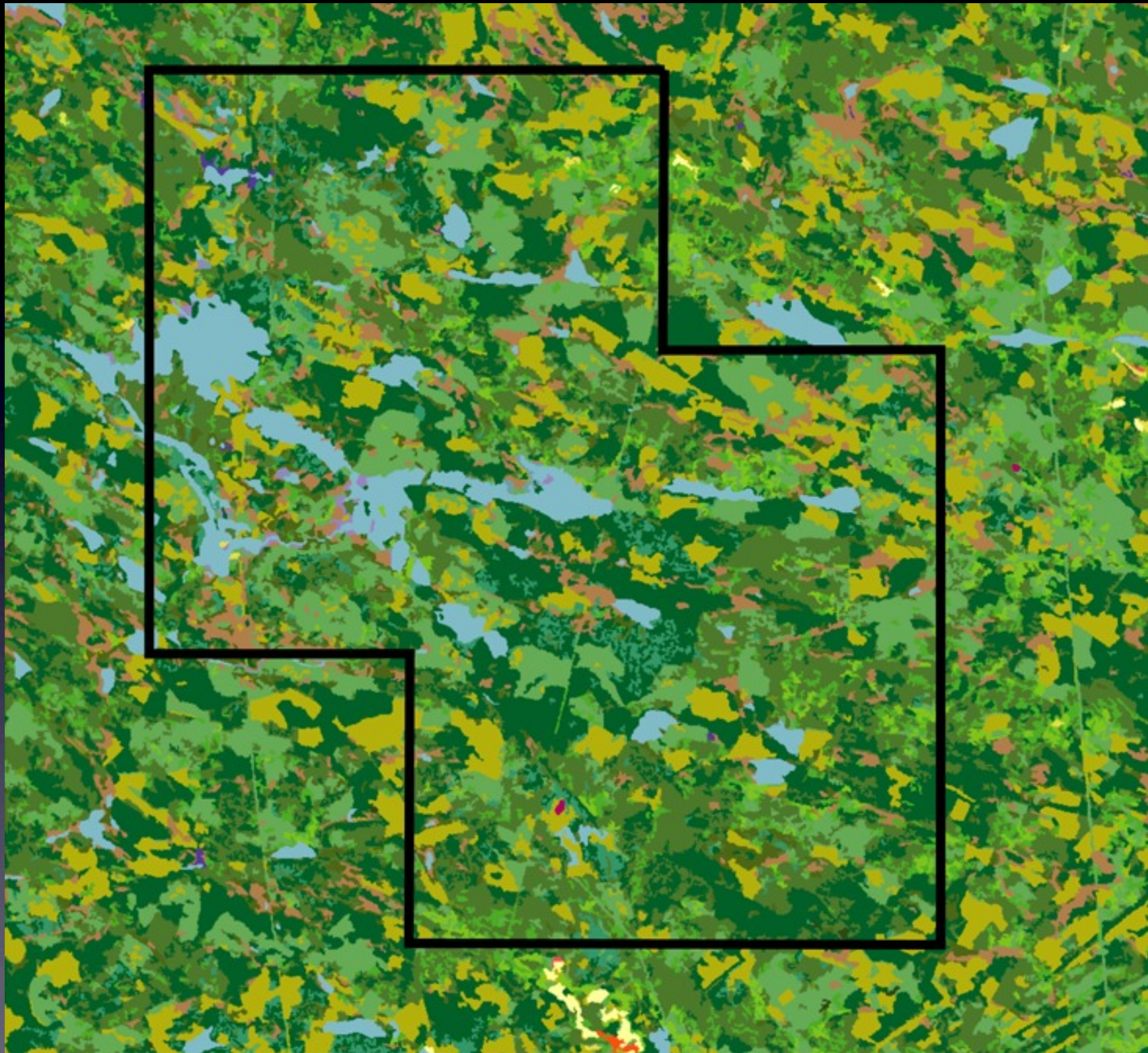
Foto: Magnus Larsson

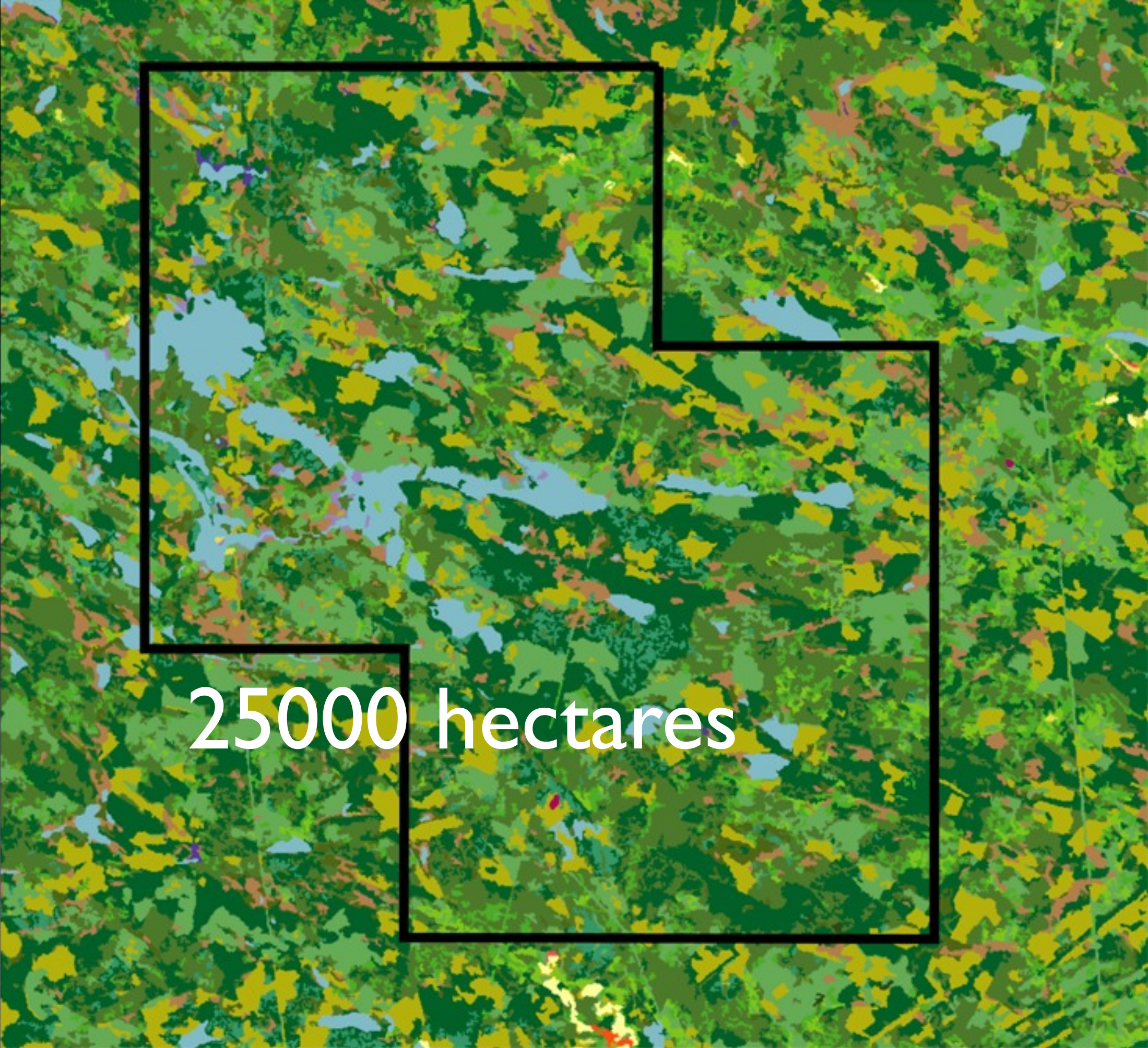
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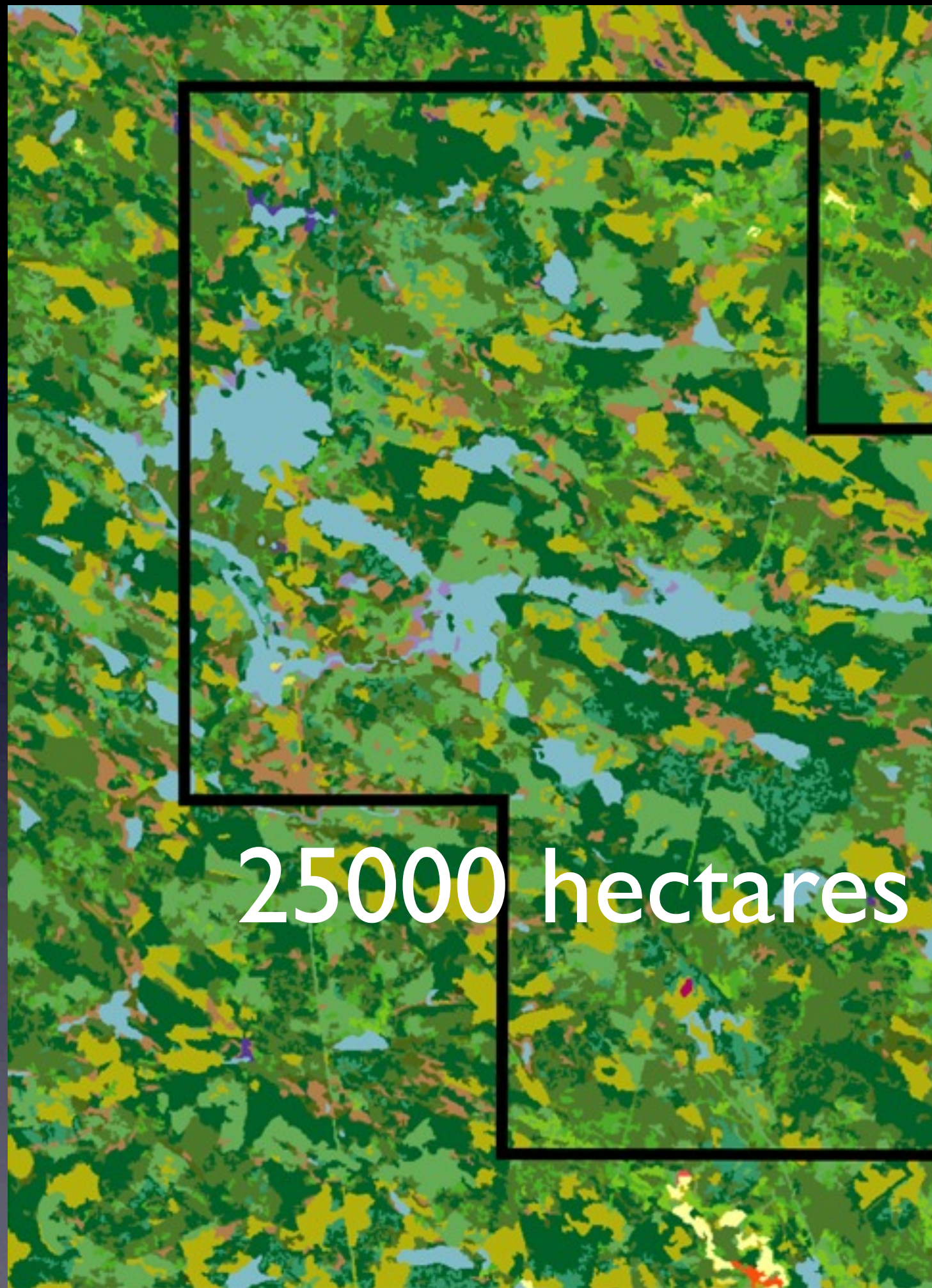


2. Proportion of populations in stumps cf. other wood in a landscape

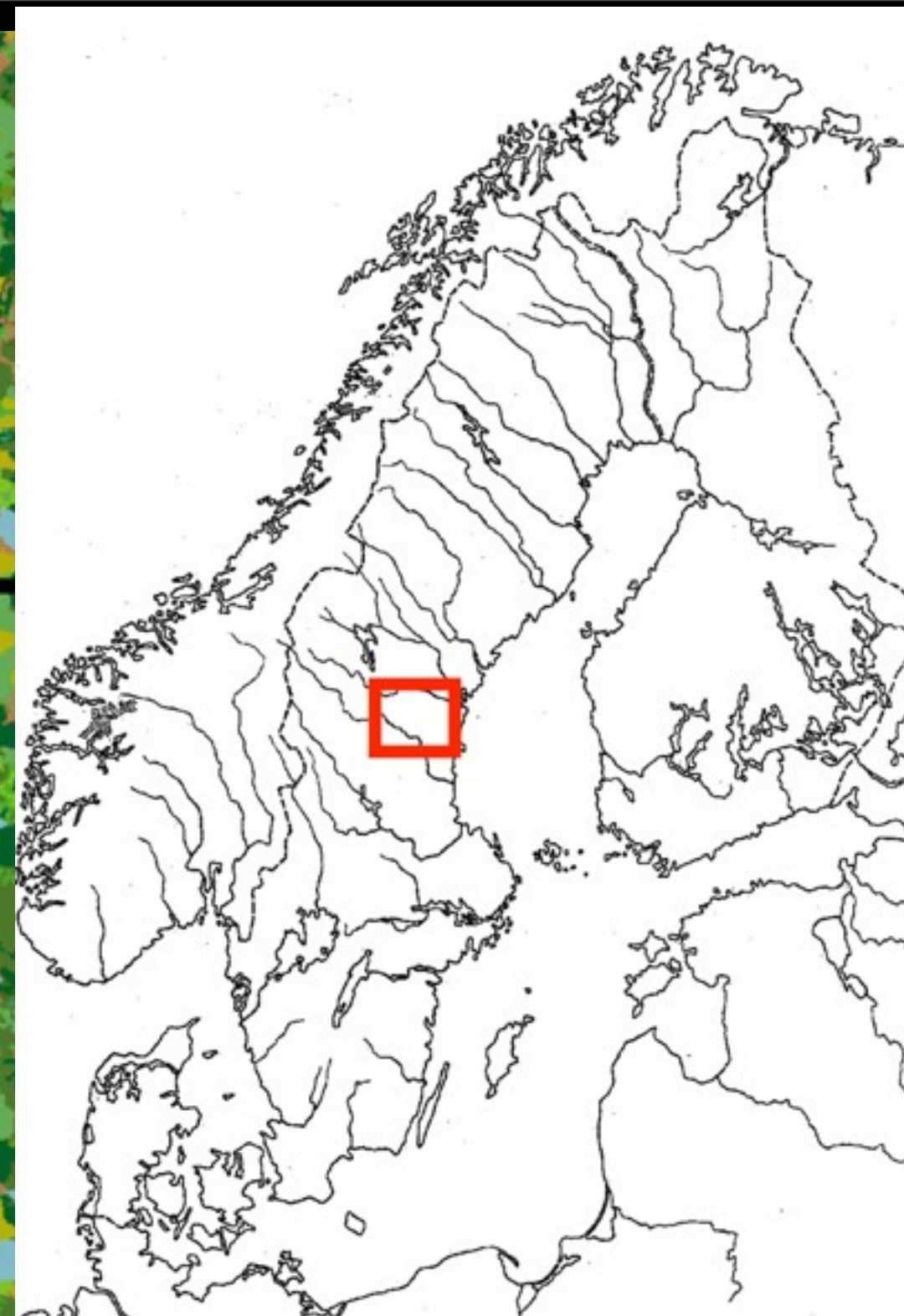


An aerial photograph of a forest with a mix of green, yellow, and brown foliage. A black outline is drawn on the image, enclosing a large, irregularly shaped area. The text "25000 hectares" is overlaid in white on the lower-left portion of this outlined area.

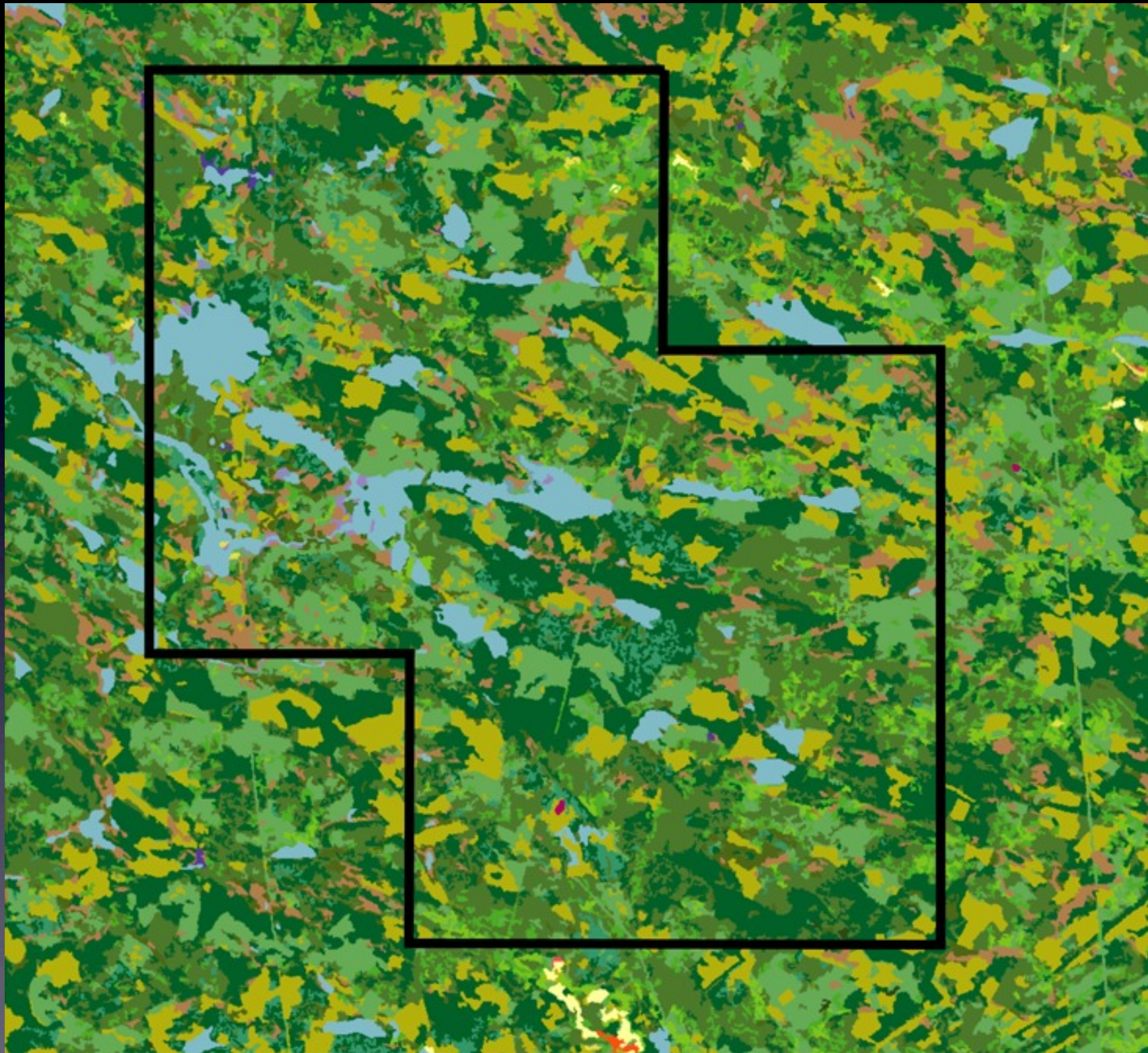
25000 hectares



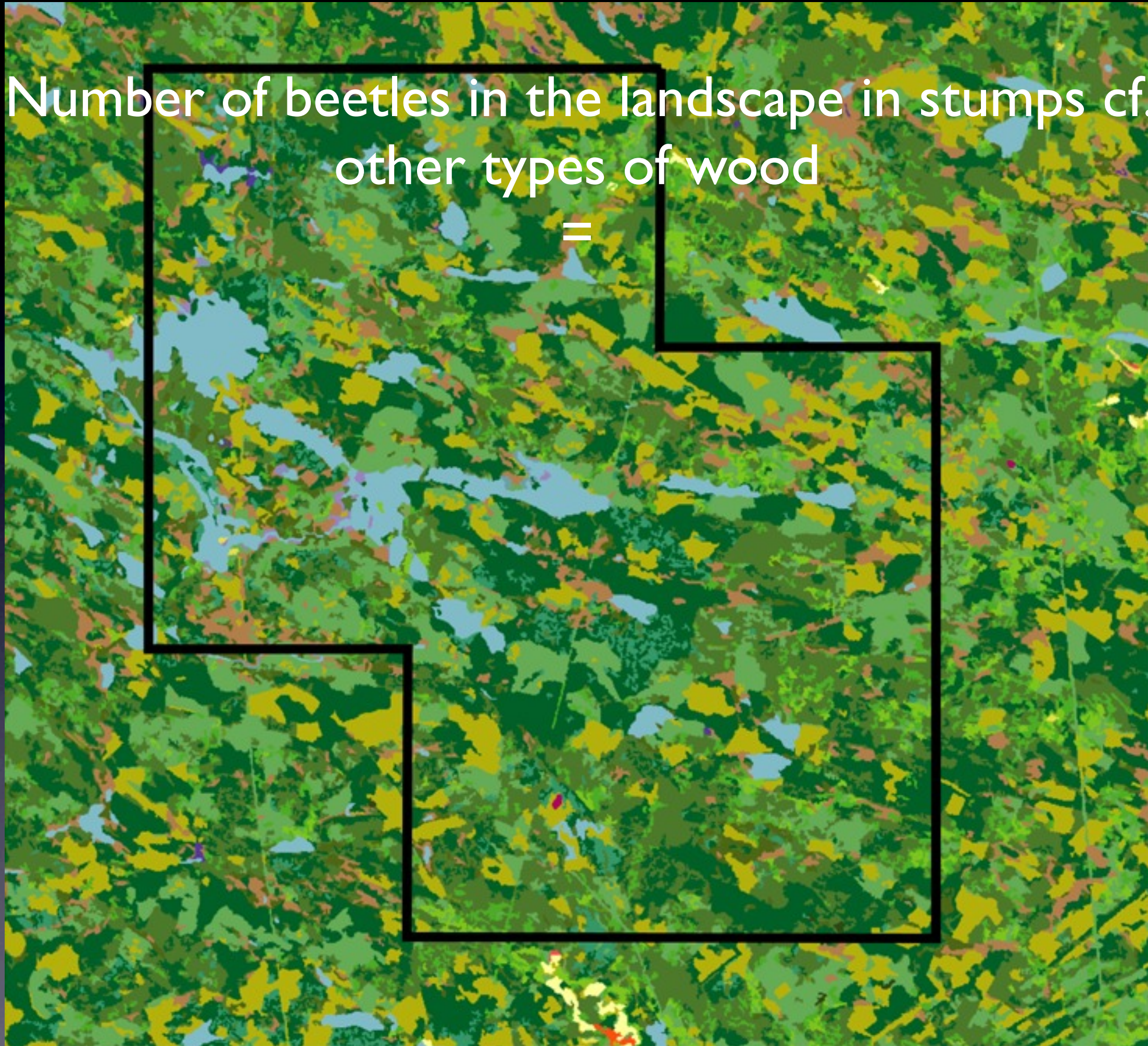
25000 hectares



- Old data on dead wood and beetles (Ekblom et al 2006, Schroeder et al 2007, McGeoch et al 2007)
- Collection of data on:
 - Clear felling stumps (beetles + wood)
 - Thinning stumps
 - Bases of standing trees



Number of beetles in the landscape in stumps cf.
other types of wood
=



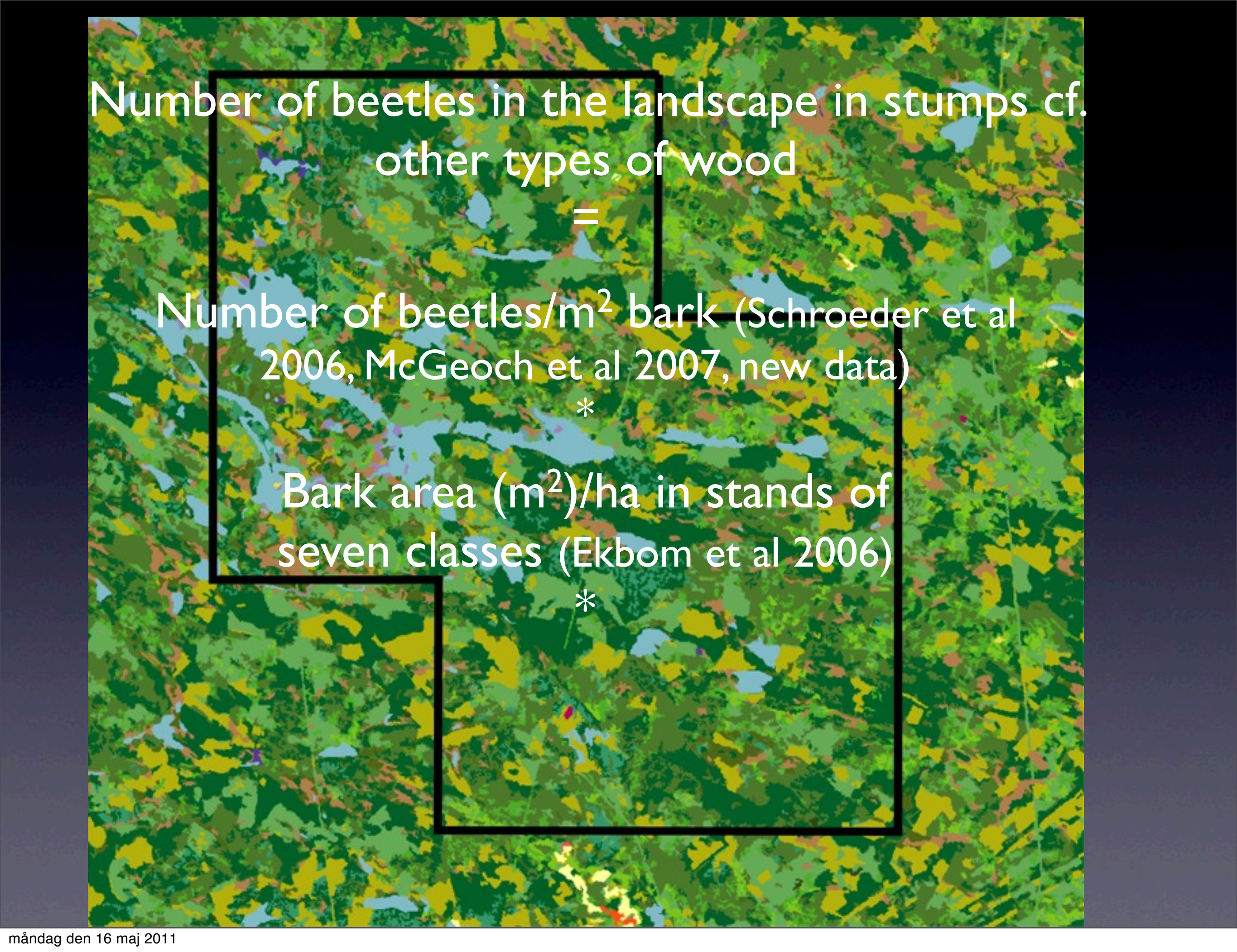


Number of beetles in the landscape in stumps cf.
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Number of beetles/m² bark (Schroeder et al
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*



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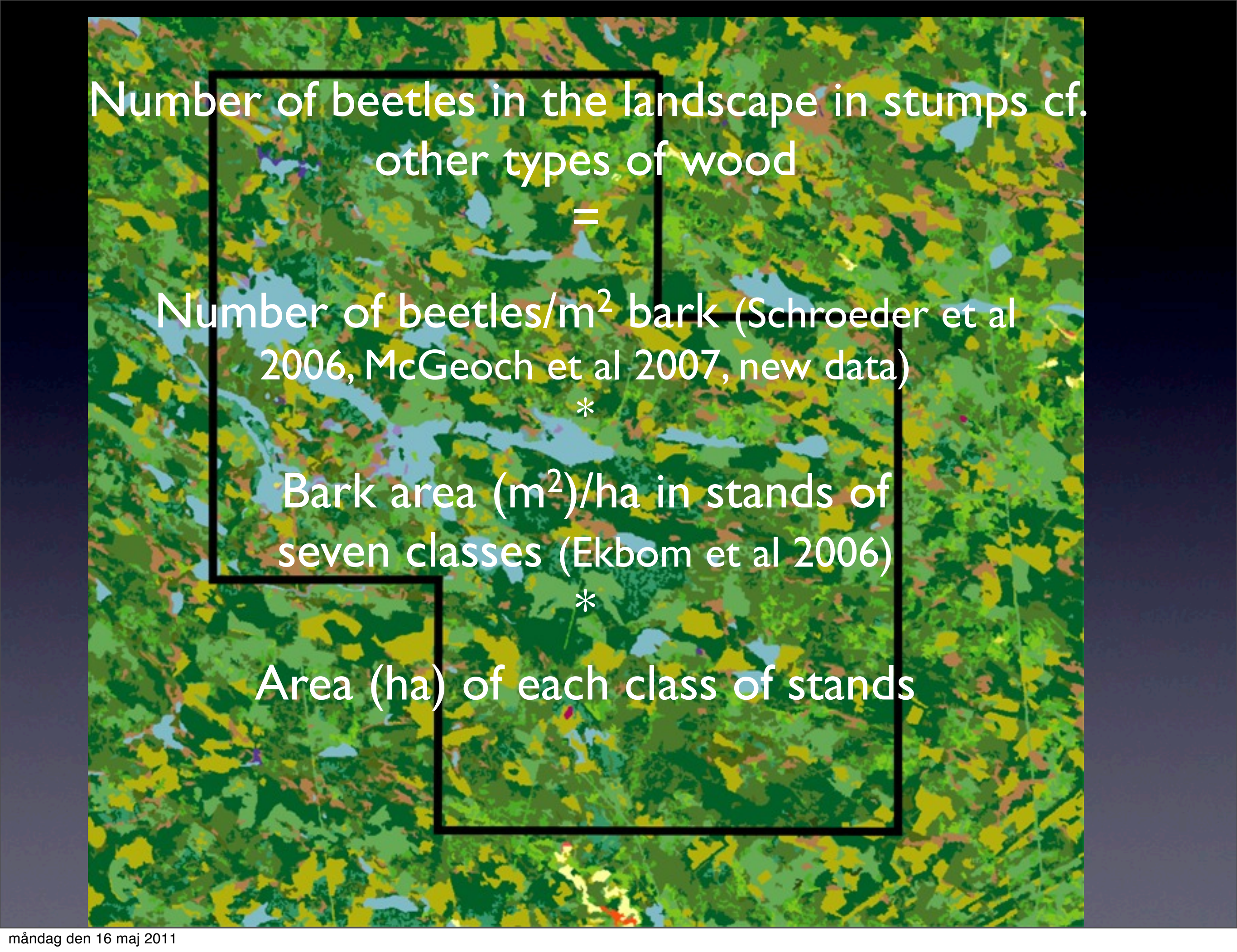
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Bark area (m²)/ha in stands of
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Bark area (m²)/ha in stands of
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Area (ha) of each class of stands

Species	% in clear f. stumps		
Sulcaxis affinis	100	Rhyncolus sculpturatus	3,8
Octotemnus glabriculus	100	Cis punctulatus	3,7
Atomaria bella	96,5	Nudobius lentus	3,3
Cis hispidus	91,1	Plegaderus vulneratus	2,6
Pteryx suturalis	87,3	Euplectus punctatus	2,5
Scaphisoma agaricinum	80,7	Agathidium pisanum	1,6
Stenichnus bicolor	73,7	Rhizophagus dispar	1,6
Corticaria longicollis	72,1	Crypturgus spp.	1,2
Hadreule elongatula	68,5	Acrulia inflata	1,1
Enicmus rugosus	51	Cerylon ferrugineum	0,7
Corticaria rubripes	42,1	Quedius plagiatus	0
Cerylon histeroides	41,4	Phleonomus planus	0
Cis boleti	37,5	Phloeonomus sjoebergi	0
Dadobia immersa	12	Phloeopora testacea	0
Abdera triguttata	9,6	Dinaraea arcana	0
Agathidium rotundatum	9,3	Leptusa fumida	0
Orthocis alni	8,8	Corticaria orbicollis	0
Leptusa pulchella	5,6	Hylurgops palliatus	0
Dryocoetes autographus	5,5	Pityogenes chalcographus	0
		Dryocoetes hectographus	0

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- Bark area: 15 % on clear felling stumps
- A landscape rich in dead wood
- 15 m³/ha (7 m³/ha)
- Nature reserves + set asides

3. Tree species and diameters



Foto: Magnus Larsson

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The image shows four bundles of birch bark samples, each tied with a black strap. The bundles are lying on a gravel surface next to a red vehicle. The bark is light brown and shows signs of peeling and decay. A white text box with the number '749' and the word 'samples' is overlaid on the center of the image.

749 samples

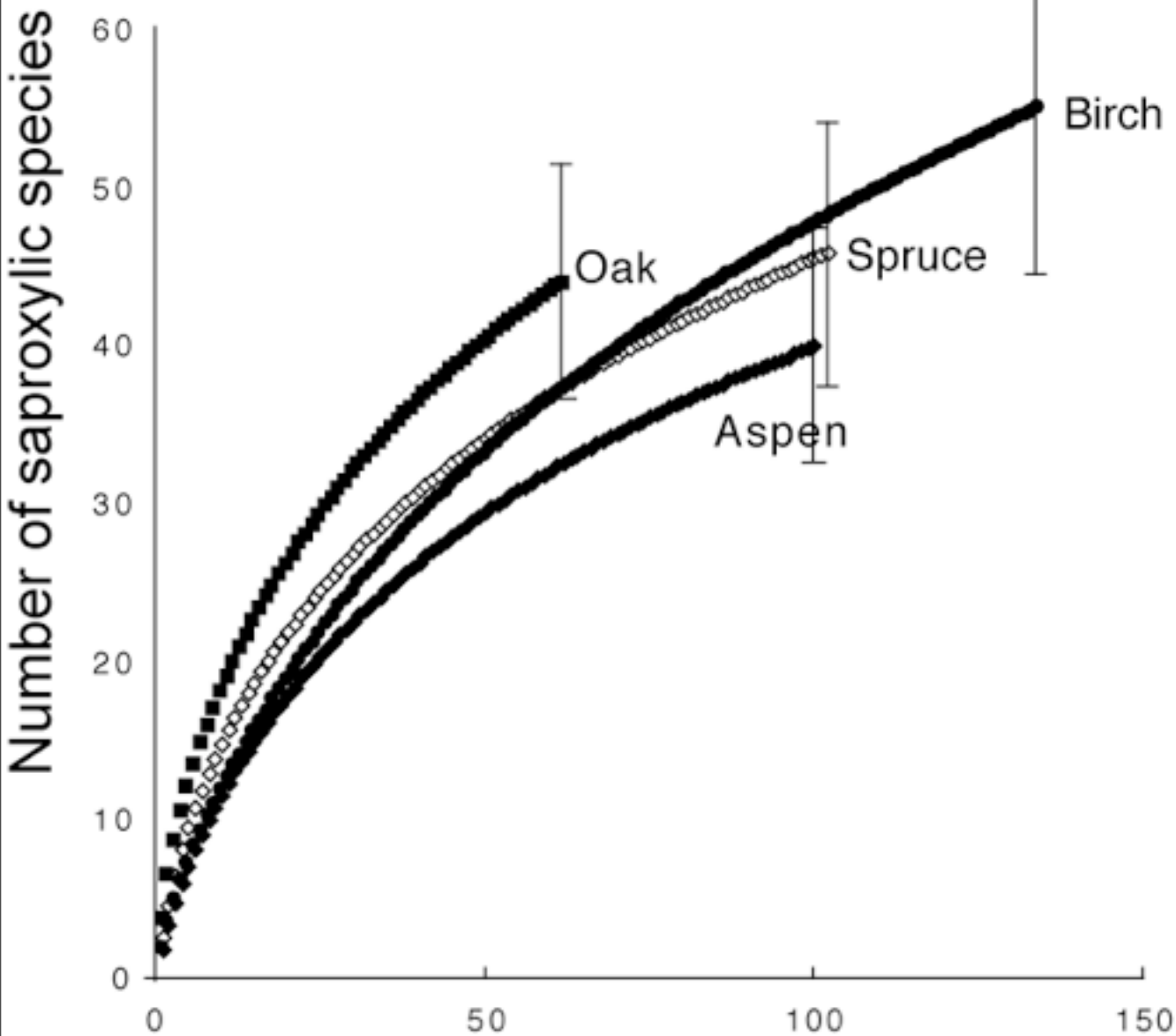


413 samples

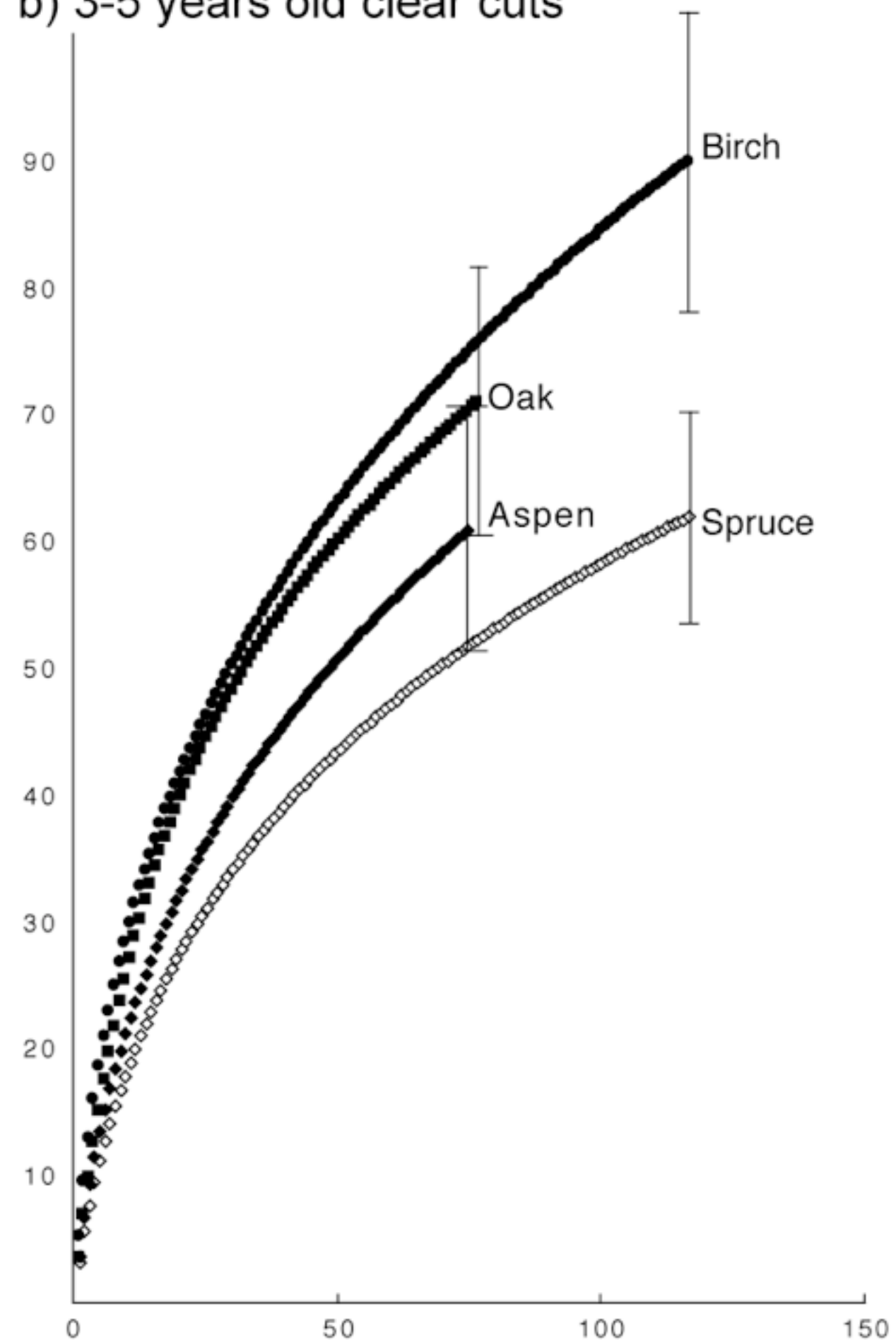
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Logging residues

a) One-summer-old clear cuts



b) 3-5 years old clear cuts



Logging residues, number of red-listed beetle species

	One summer old	3-5 yrs old
Aspen	5	8
Birch	3	6
Oak	5	4
Spruce	1	(1)

Logging residues, associations with wood diameters

Category	Number of species
Fine (1-4 cm)	16
Intermediate (4-8 cm)	4
Coarse (8-15 cm)	22
No sign trend	14

Stumps

Total number of species



Conclusions

- Bioenergy wood is a rich substrate for saproxylic species - incl. redlisted species
- Some species have >50% of pop in stumps
- Deciduous trees have a richer fauna
- Diameter is/seem not to be a variable to base conservation recommendations on

Jonsell, M, Hansson, J. & Wedmo, L. 2007. Diversity of saproxylic beetle species in logging residues in Sweden – comparisons between tree species and diameters. – *Biological Conservation* 138: 89-99.

Jonsell, M. 2007. Effects on biodiversity of forest fuel extraction, governed by processes working on a large scale. – *Biomass & Bioenergy* 31: 726-732.

Jonsell, M. 2008. Saproxylic beetle species in logging residues: which are they and which residues do they use? – *Norwegian Journal of Entomology* 55: 109-122.