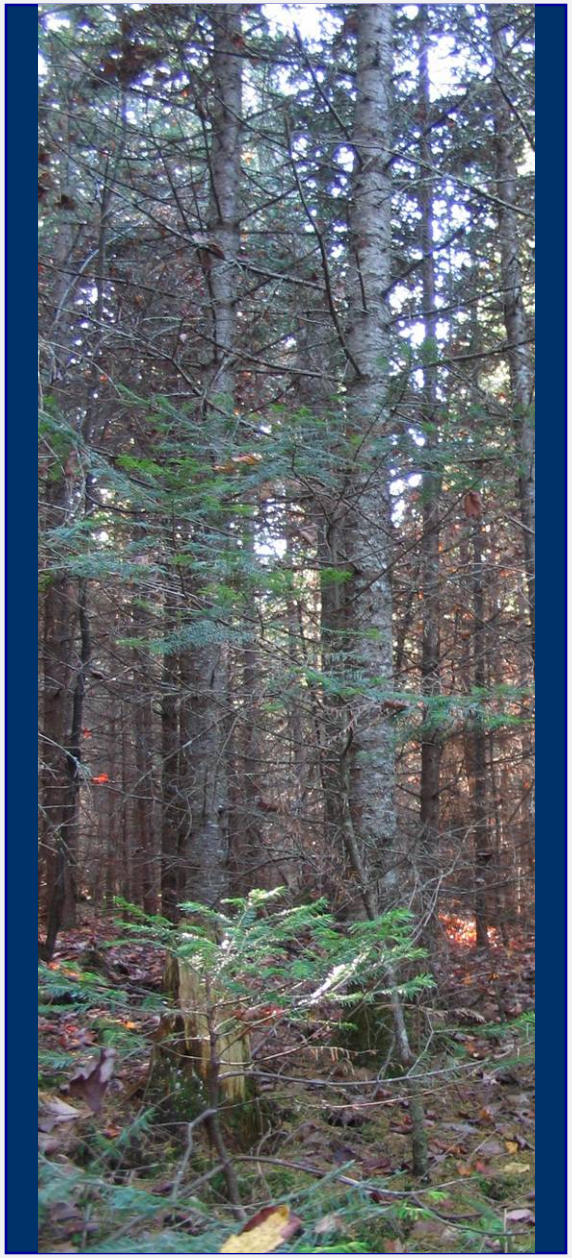

THE RESPONSE OF FOREST FLOOR BRYOPHYTES TO PRECOMMERCIAL THINNING IN THE ACADIAN FOREST.

Fall 2008

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Bryophytes

- my study: mosses, liverworts
- small primitive plants
  - no vascular or root system
  - poikilohydric
- ecologically important
  - moisture regimes
  - pH
  - forest nutrient cycling

Bryophytes and forestry

- many bryophytes are sensitive to changes in microclimate
- changes induced by:
  - canopy removal
  - site preparation (e.g. scarification)
  - tending (e.g. herbicide)

(Daniels and Kariyappa, 2007; Dynesius et.al. 2007; Friedel et.al. 2006; Vellak and Ingerpuu 2005; Fenton et.al. 2003)

Forest management options after harvest

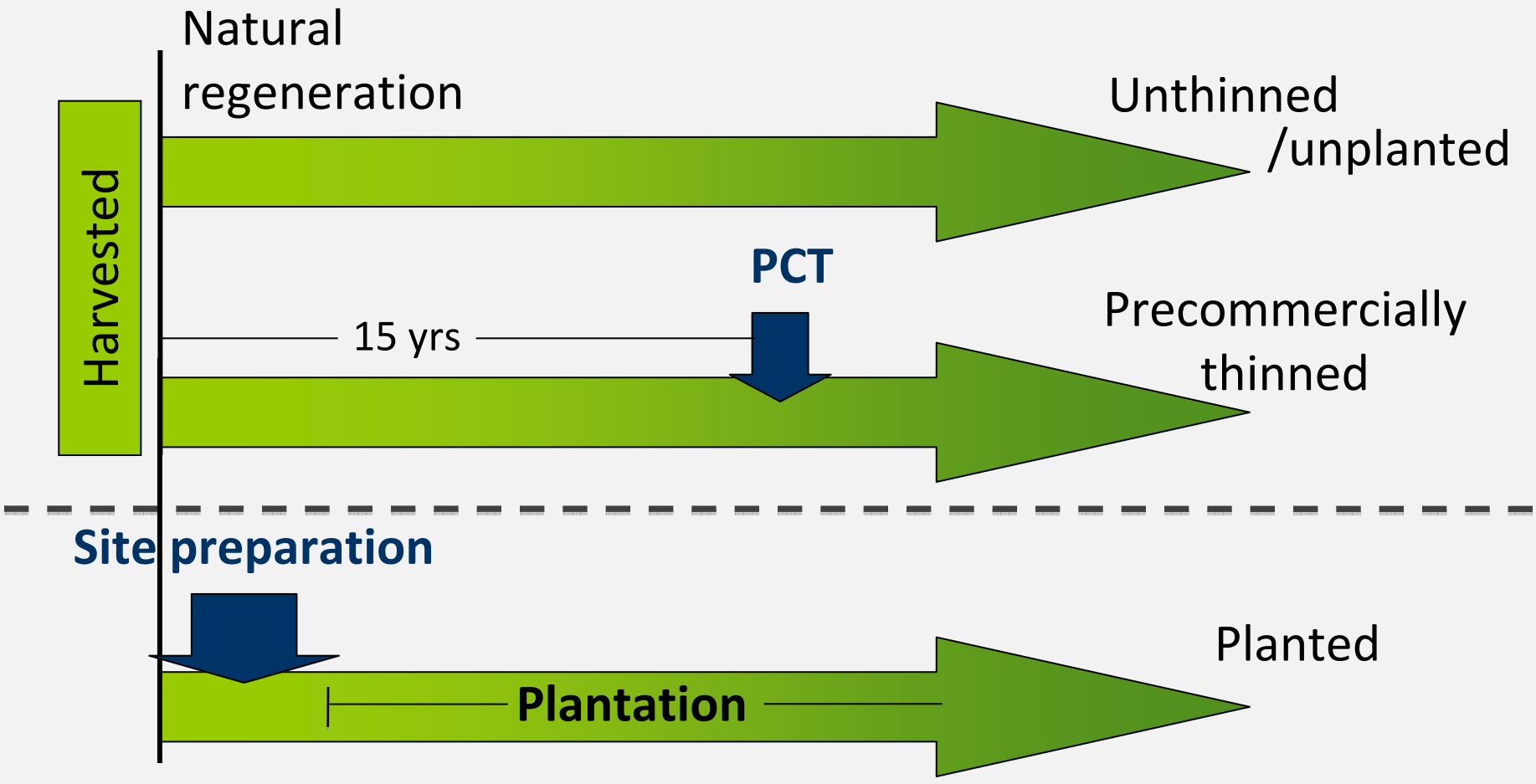
Natural regeneration:

- slower growth rate
- longer rotation period
- decreased timber supply
- less severe disturbance

? Precommercial thinning ?

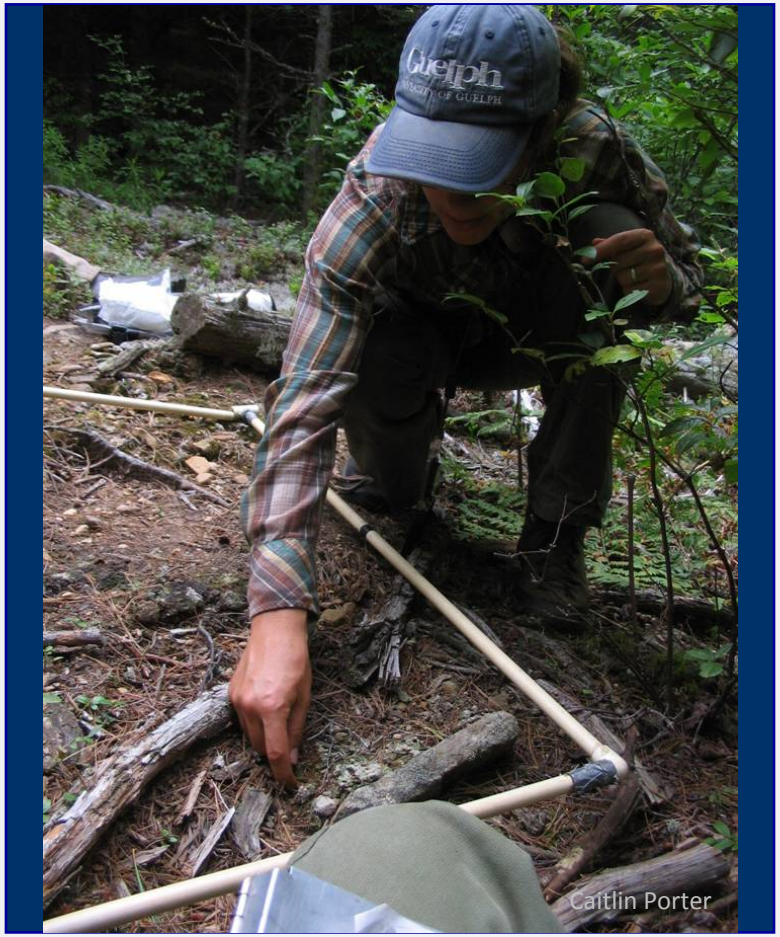
- less severe disturbance?
  - canopy cover
  - stand density
  - available substrate

How might PCT affect bryophytes?



Ross-Davis and Frego 2002

Methods



Stands:

- 25 mixedwood stands
  - 15 precommercially thinned
  - 10 unthinned
- ages ranged 17 – 41 yrs

Plots:

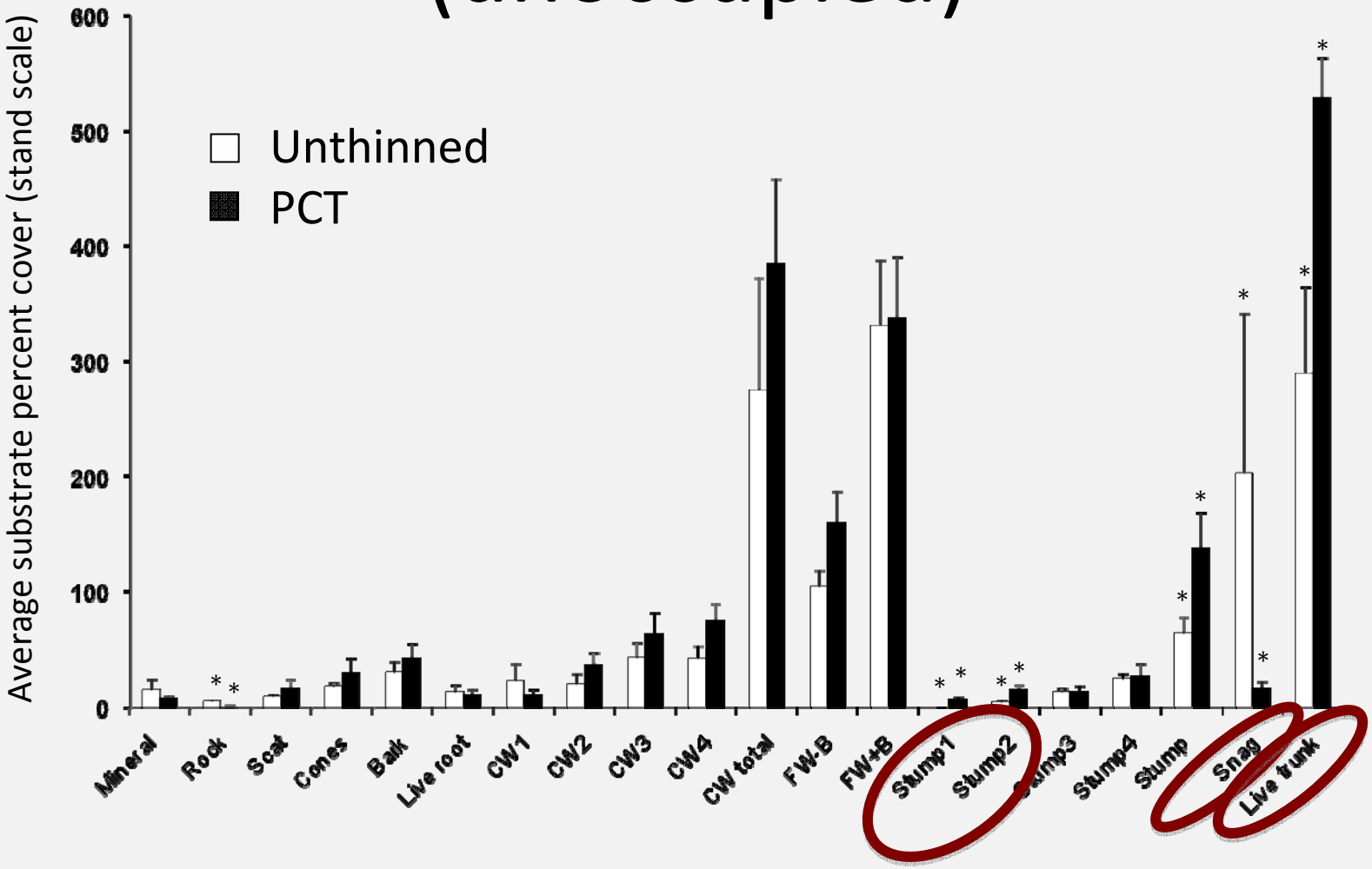
- 50 1m^2 plots per stand
- randomly along 4 parallel transects

Data:

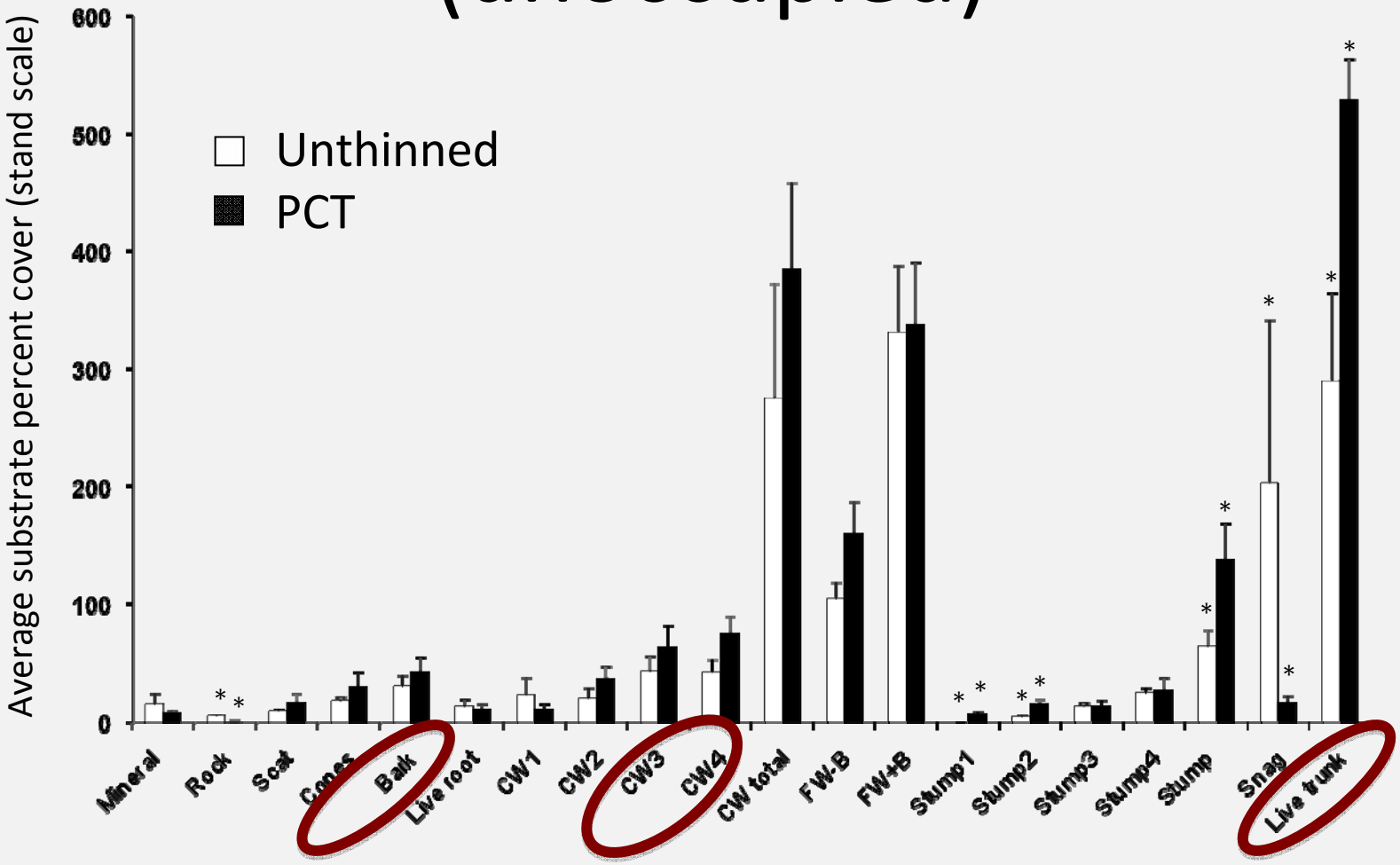
- percent cover of each forest floor bryophyte species
- substrate occupied and unoccupied
  *in 3-dimensional

Results

Average substrate cover (unoccupied)

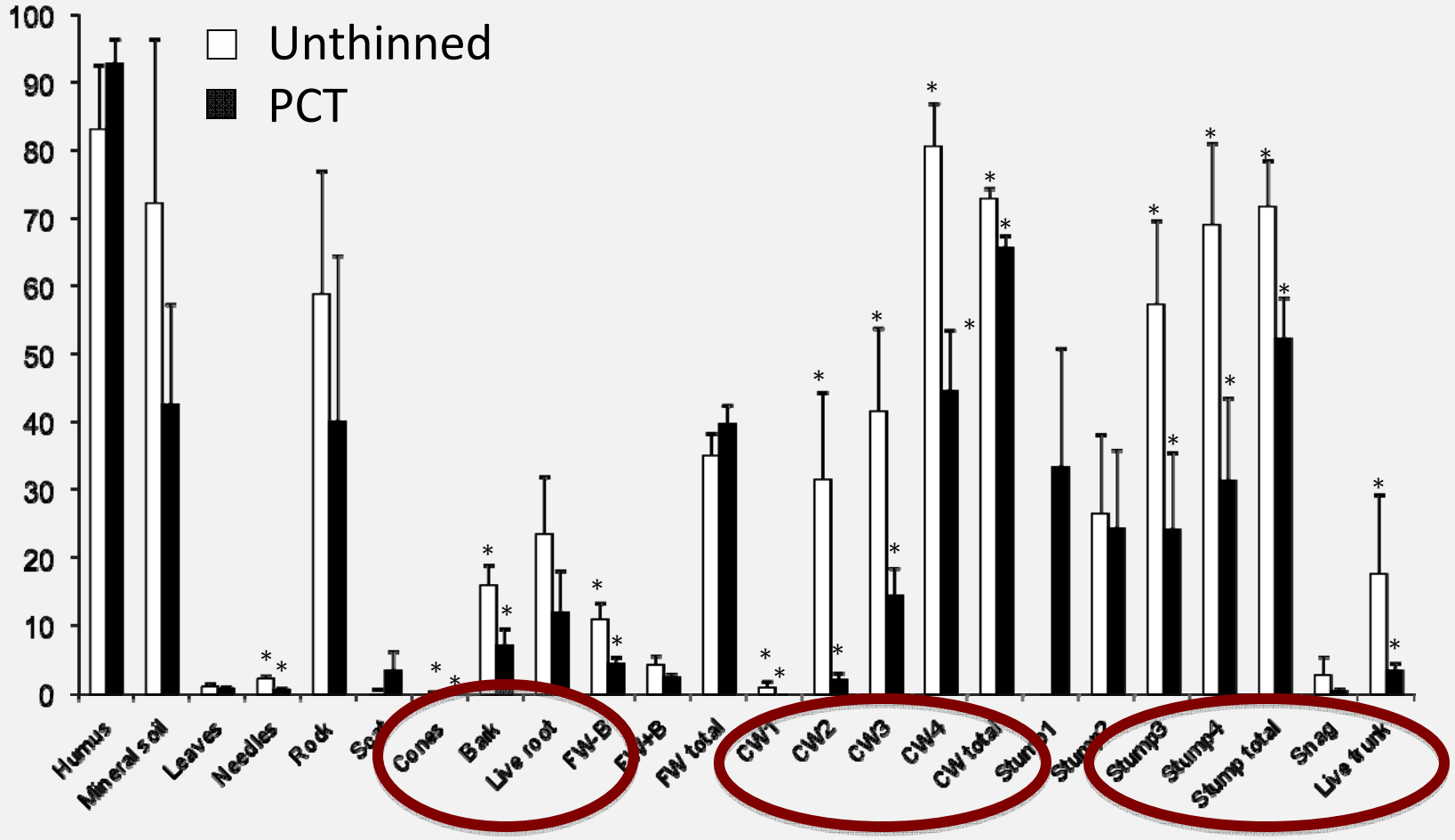


Average substrate cover (unoccupied)

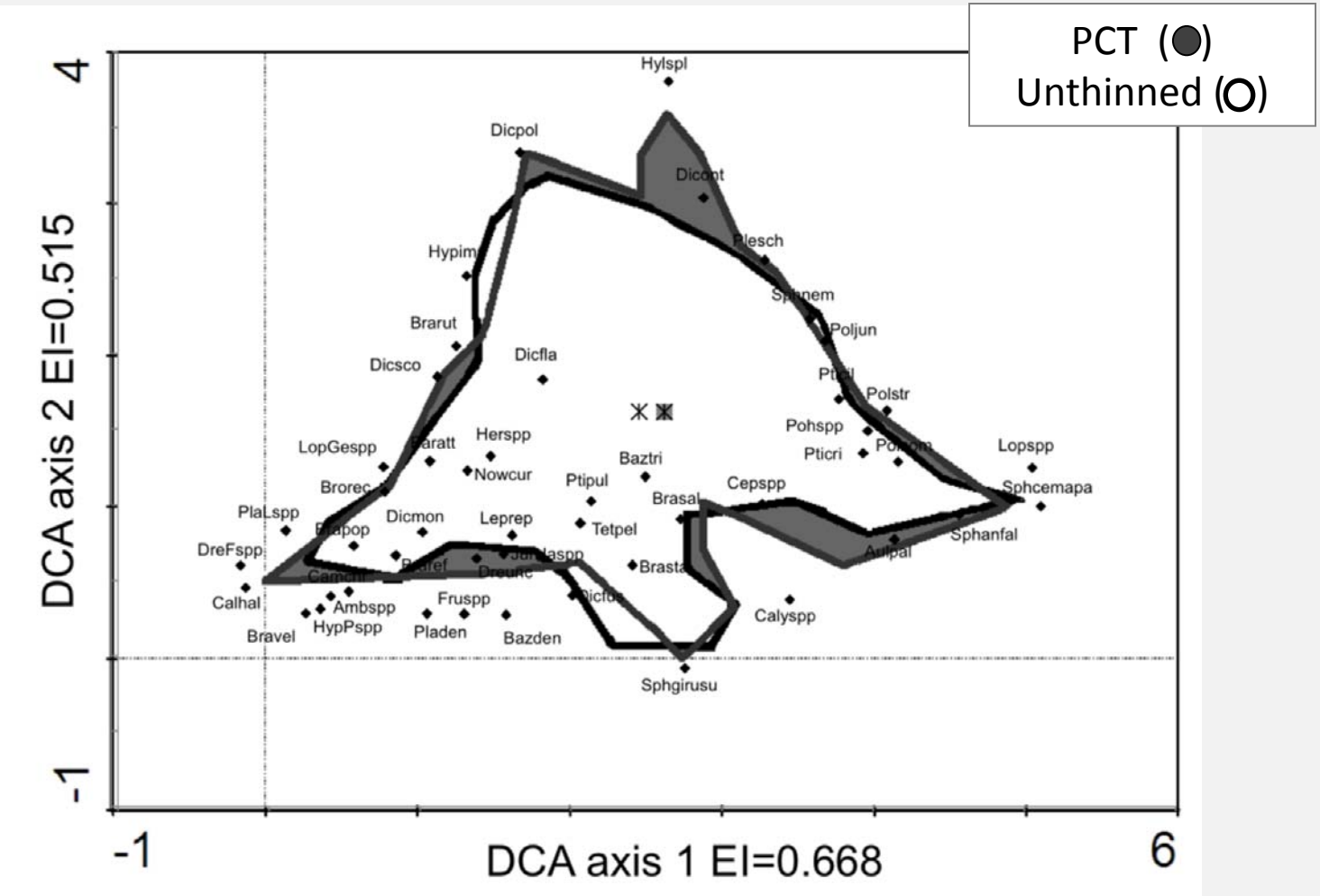


(Ross-Davis and Frego, 2002; Mathieson,

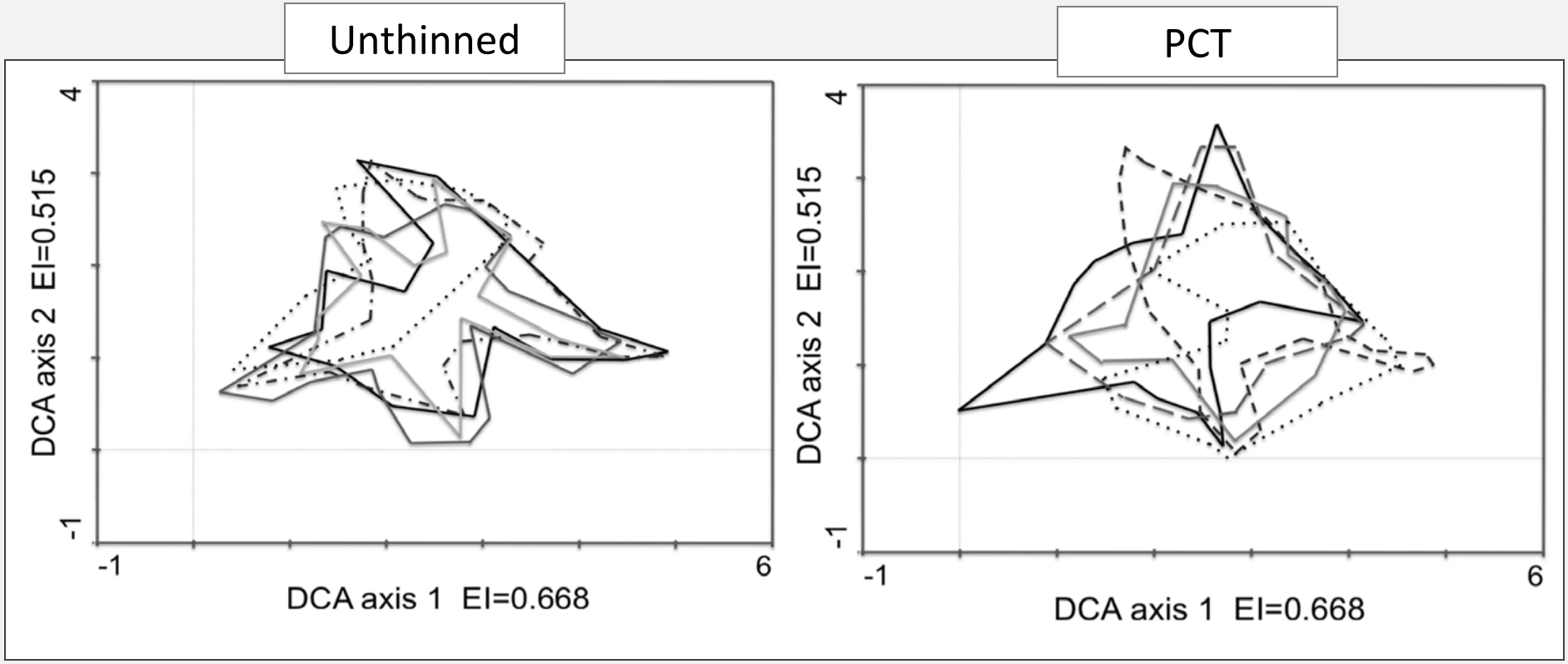
Percent of total substrate occupied



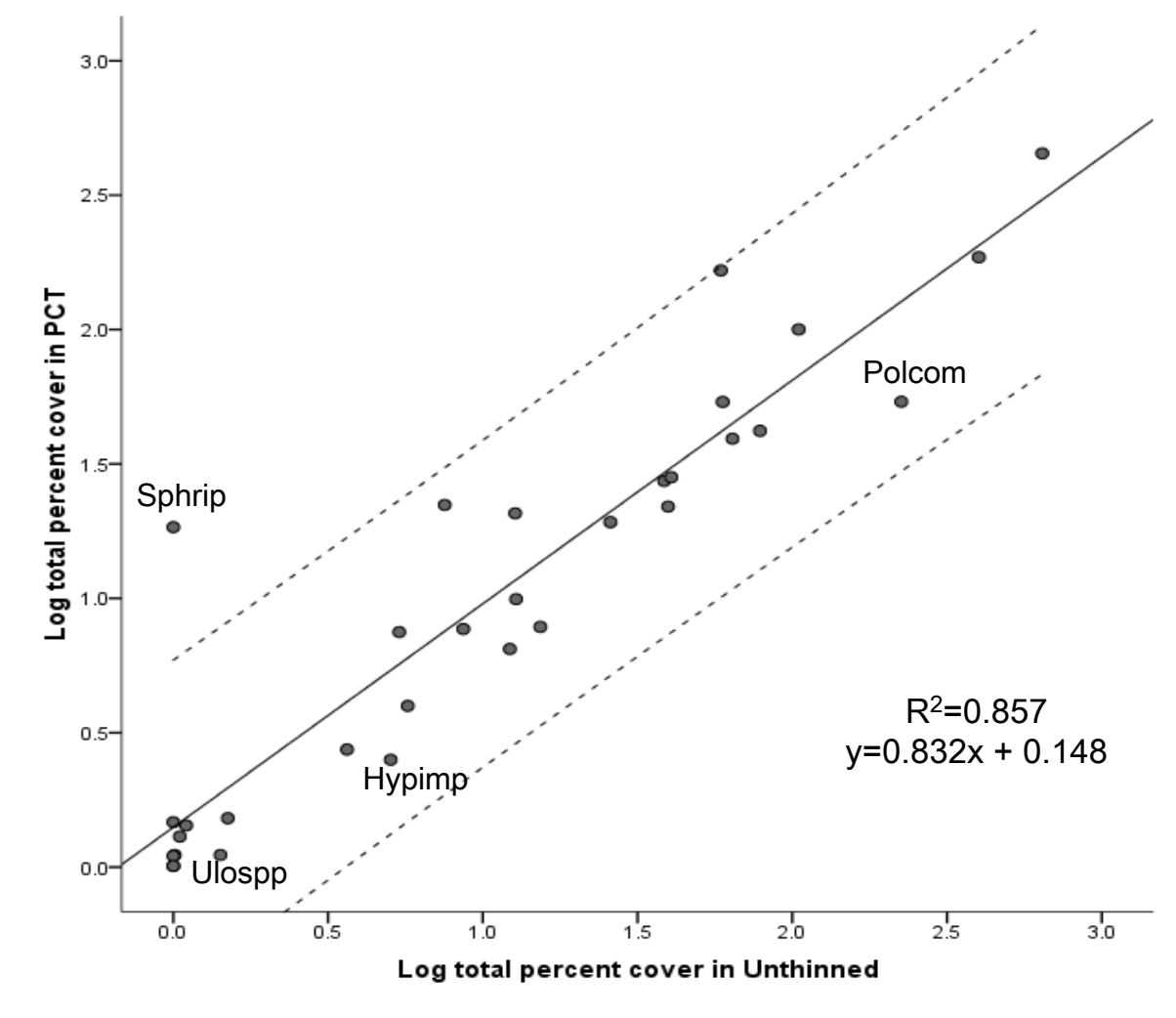
Species composition



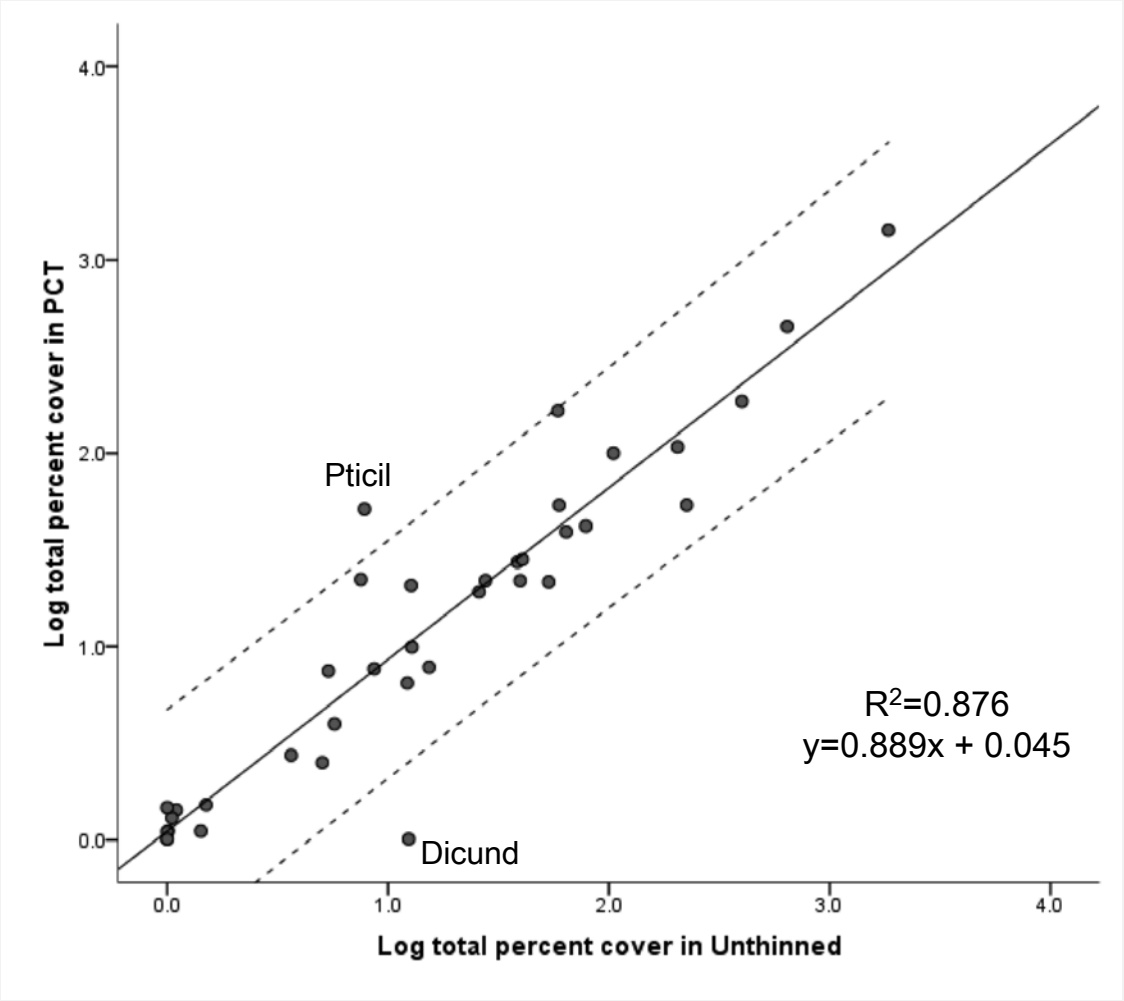
Stand level composition



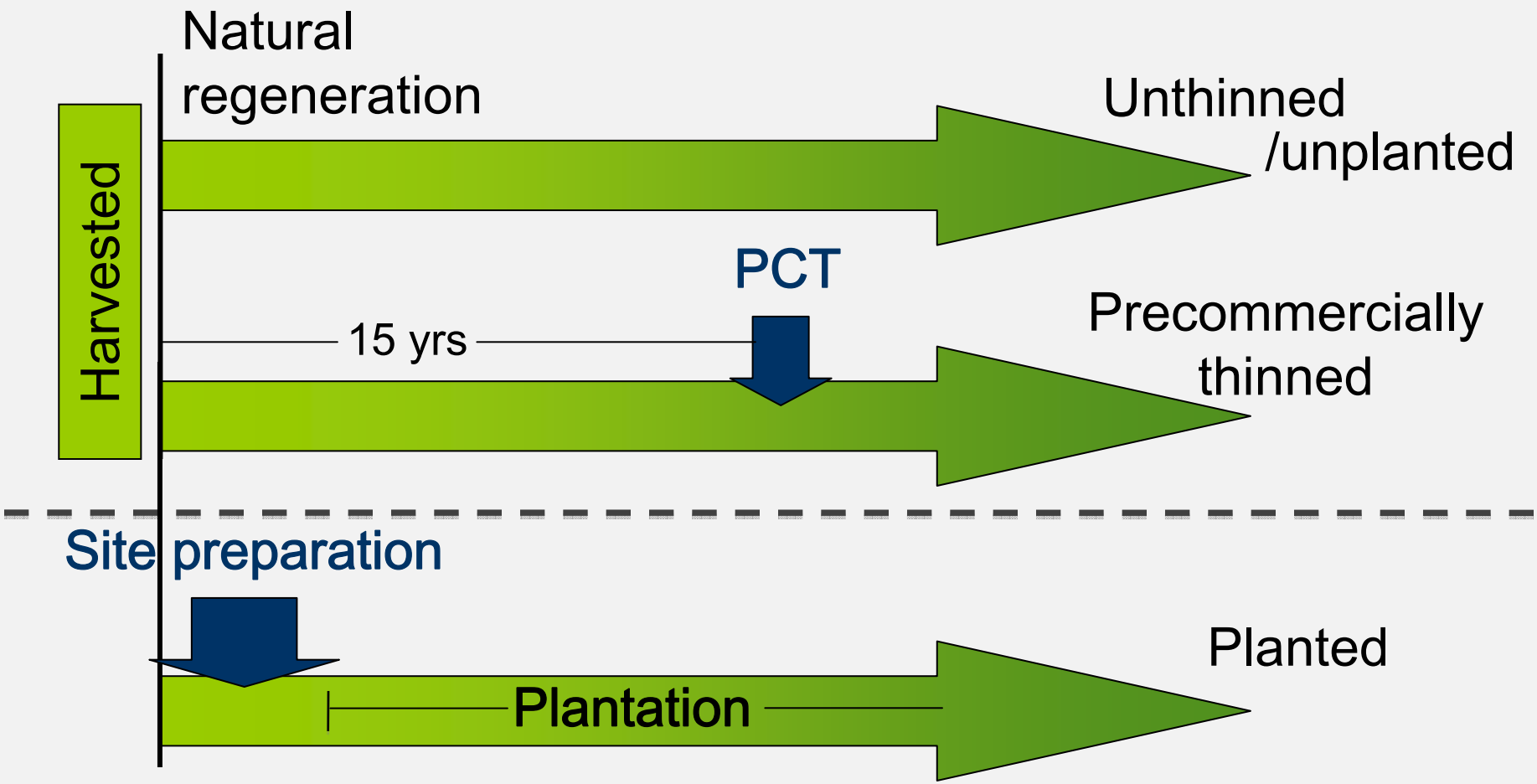
Species of concern



Species associated with substrates of concern

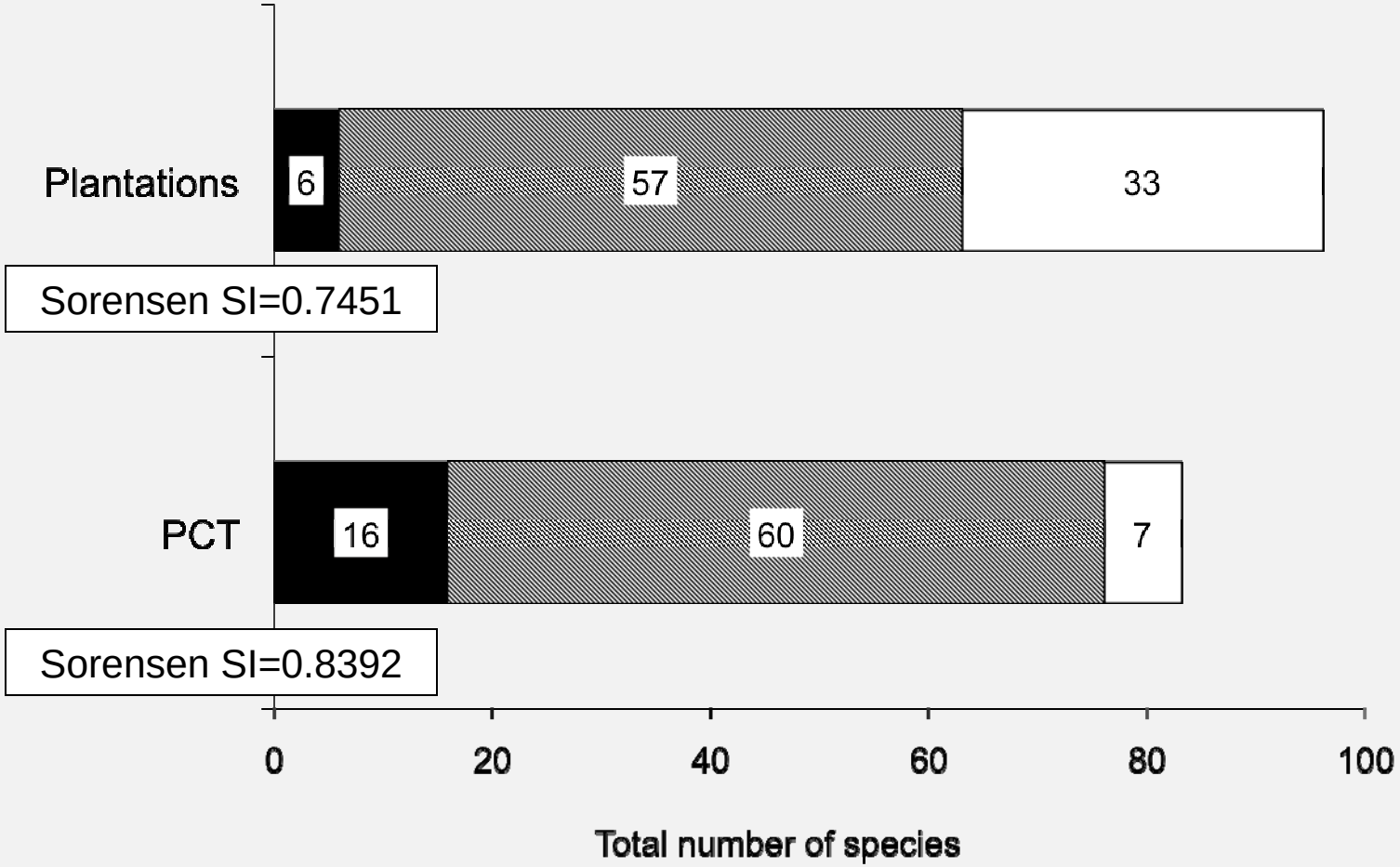


How might PCT affect bryophytes?

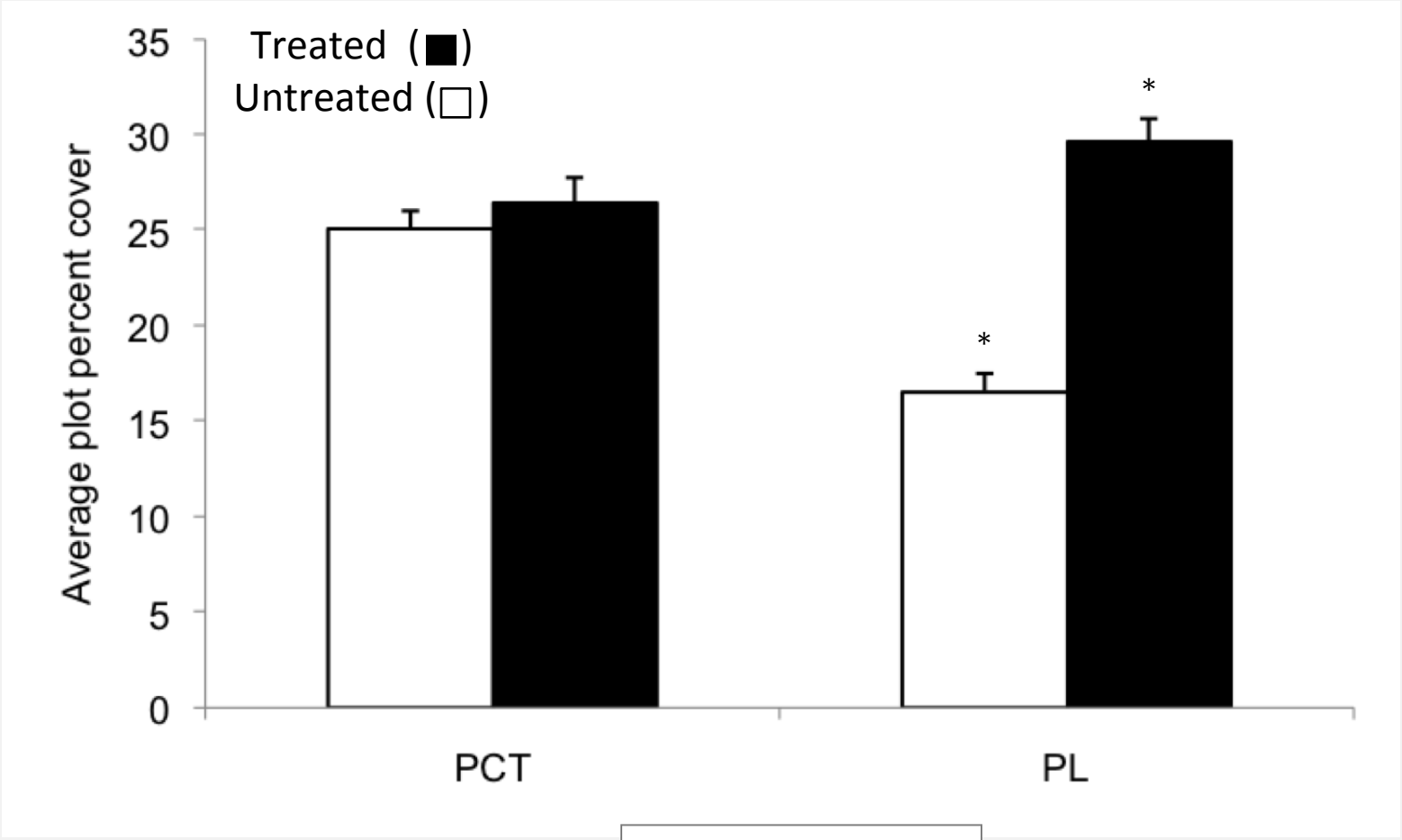


Ross-Davis and Frego 2002

Species similarity

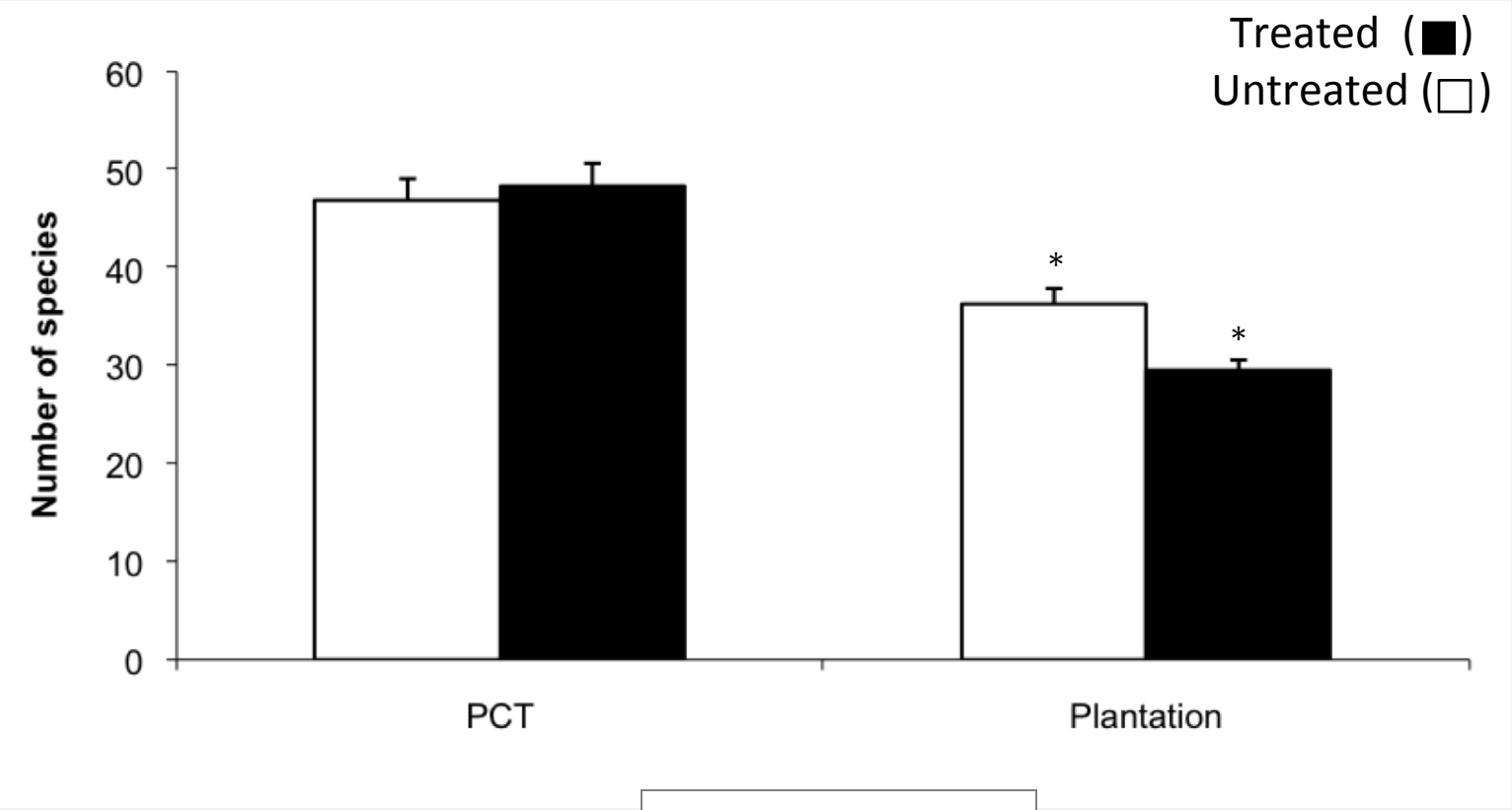


Average bryophyte cover



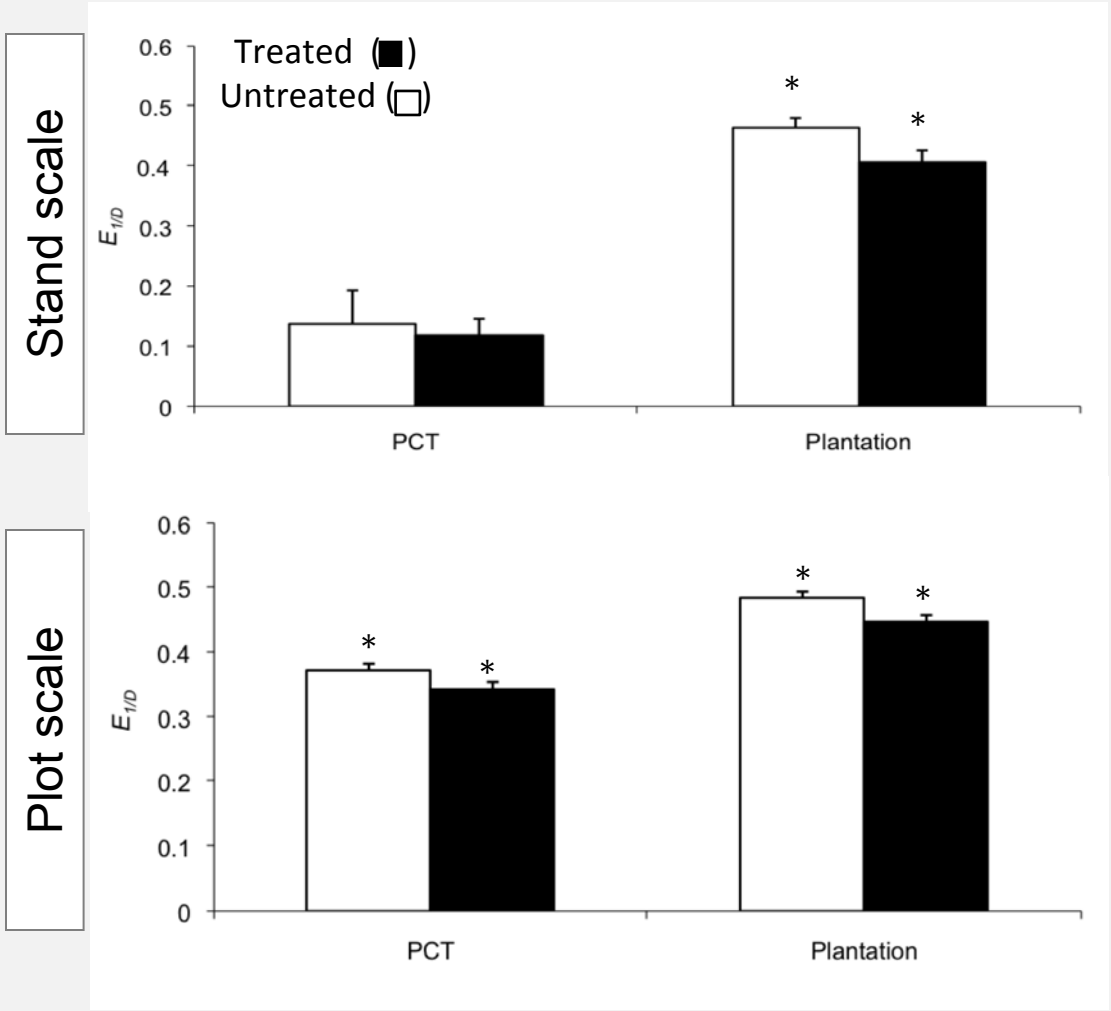
Plot scale

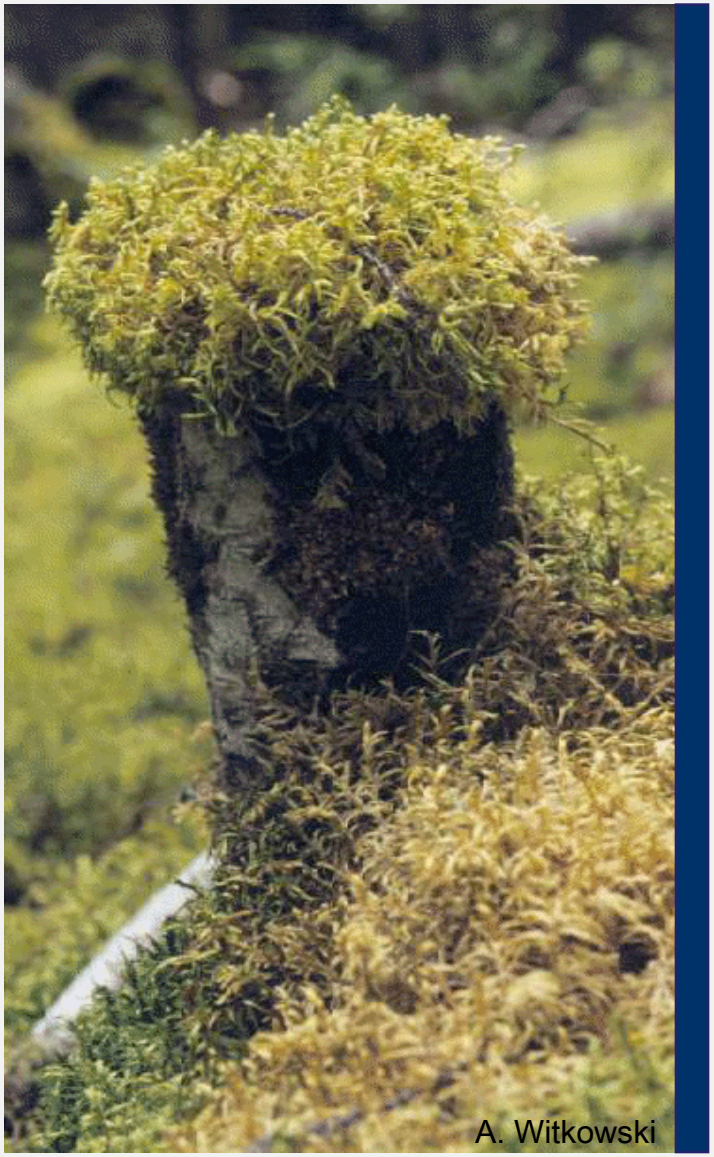
Species richness



Stand scale

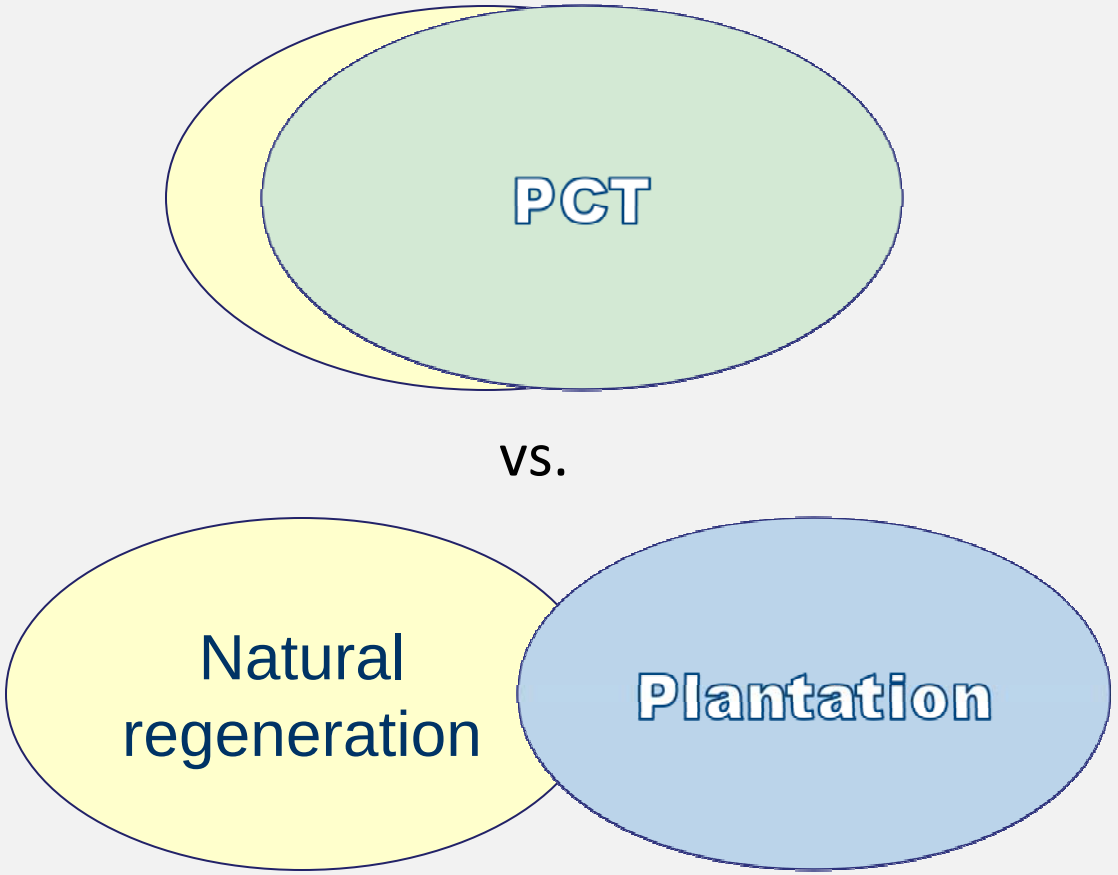
Evenness


Stand scale
Treated (■)
Untreated (□)
$E_{1/D}$
0.6
0.5
0.4
0.3
0.2
0.1
0
*
*
PCT
Plantation
Plot scale
$E_{1/D}$
0.6
0.5
0.4
0.3
0.2
0.1
0
*
*
*
*
PCT
Plantation

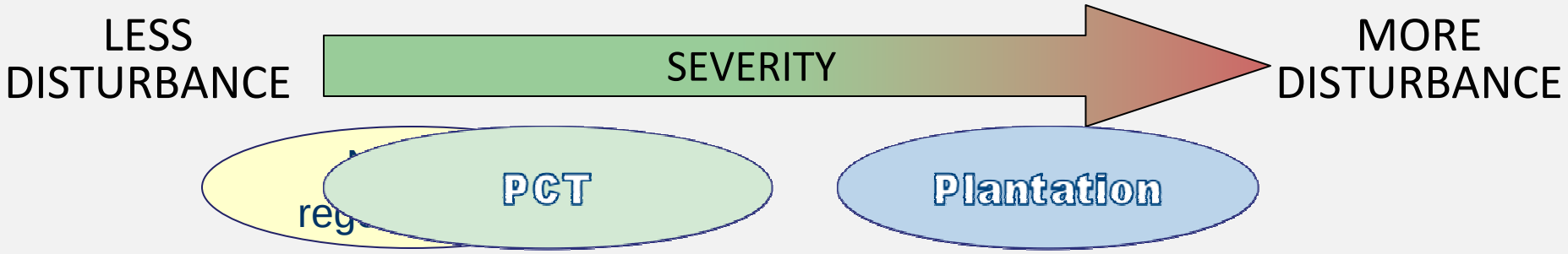


Conclusions

Interpreting the results:



Conservation of bryophytes



On a relative scale comparing managed Acadian forest:

PCT is (more) effective in conserving many bryophyte species by 37 years post treatment

compared to effects of plantation management.

KNOWLEDGE GAP:
bryophytes on woody substrates

(Ross-Davis and Frego 2002)

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Questions?