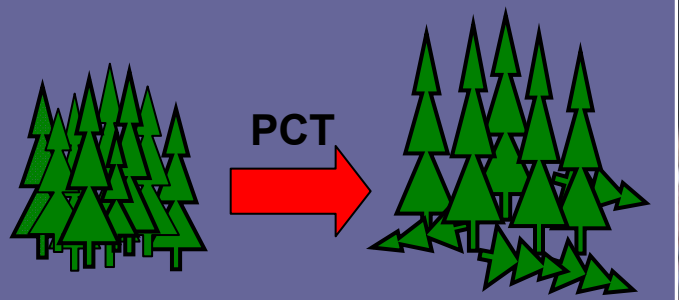
Small mammal response to pre-commercial thinning over a 20 year period



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Outline

- Introduction
- Objectives
- Methods
- Analysis
- Results + Discussion
- Questions

PCT and small mammals

Small mammals

- Associated with forest structures

PCT

- Creates gaps in canopy
- Increases ground vegetation
- Increases downed woody debris
  → Microdebris

Objectives:

1) determine if PCT affects the abundance of forest floor small mammal species through time

2) identify relationships between vegetation and stand structure variables and abundance

Does PCT affect small mammals?

- Compare species abundance in PCT vs. un-thinned control sites
- Use measured stand structure variables to model species abundance

Design

- Three age classes: 5, 10, 20 yrs after PCT
- Thinned and unthinned control sites of similar age and stand history
- Clearcut with natural regeneration

Small mammal trapping

- 45 sites sampled (27 PCT, 18 Control)
- 16 stations, 20m apart on 300m transect
- 1 Sherman live trap + 1 pitfall trap
- 7 trap nights
- Captures/100 trap nights

Statistical Analysis

Comparing abundance:

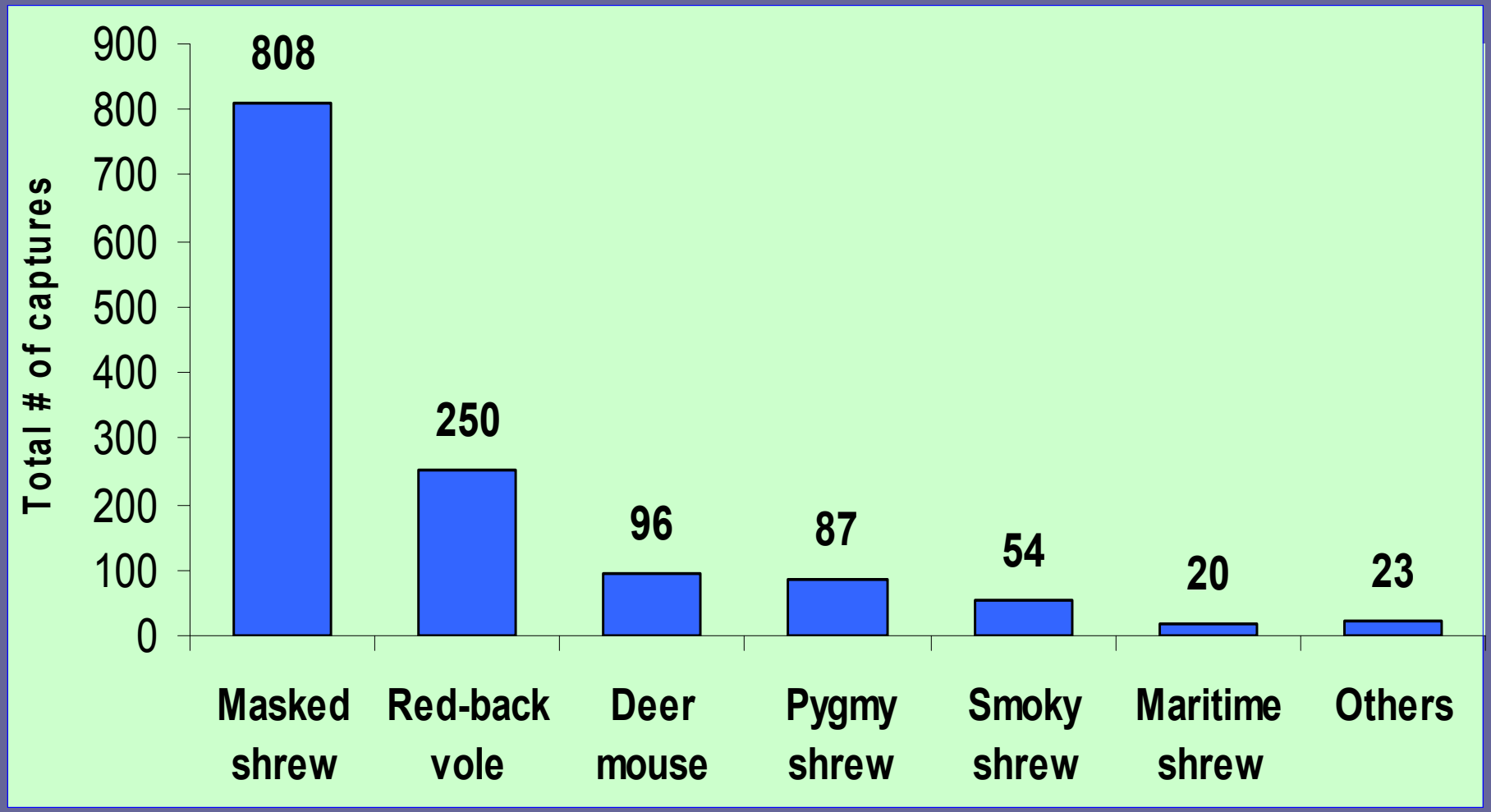
- 2-way ANOVA tests (Treatment x Age class)

Model Selection → Work in progress

- multiple regression

- R (v. 2.4.1)

Capture numbers

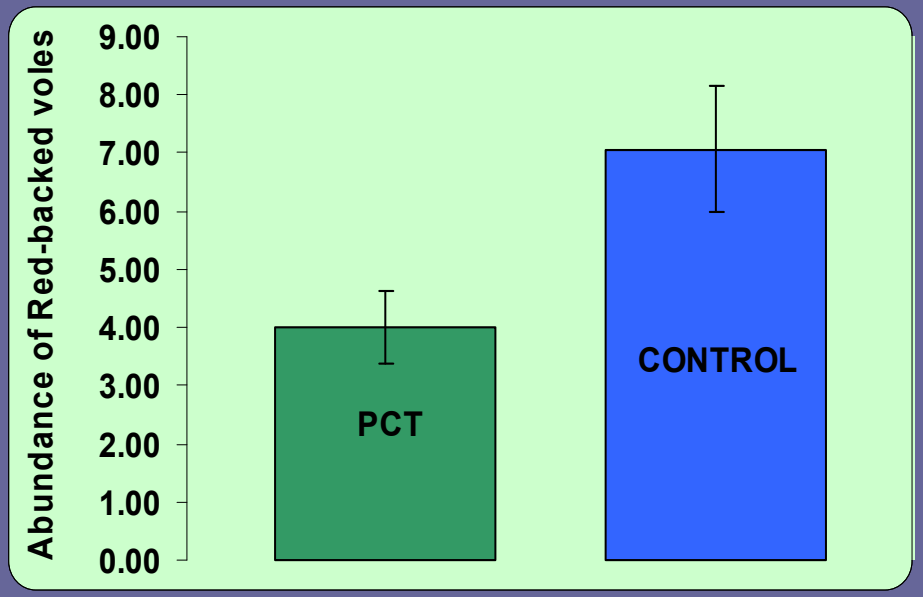


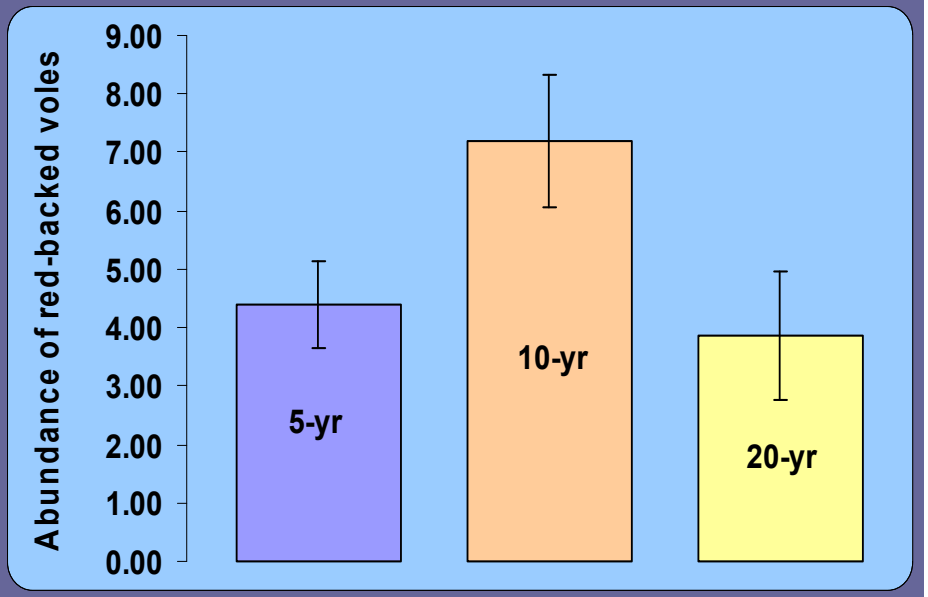
Masked shrew

- No significant effect of treatment ($p = 0.372$)
- No significant effect of Age class ($p = 0.109$)

Red-backed vole

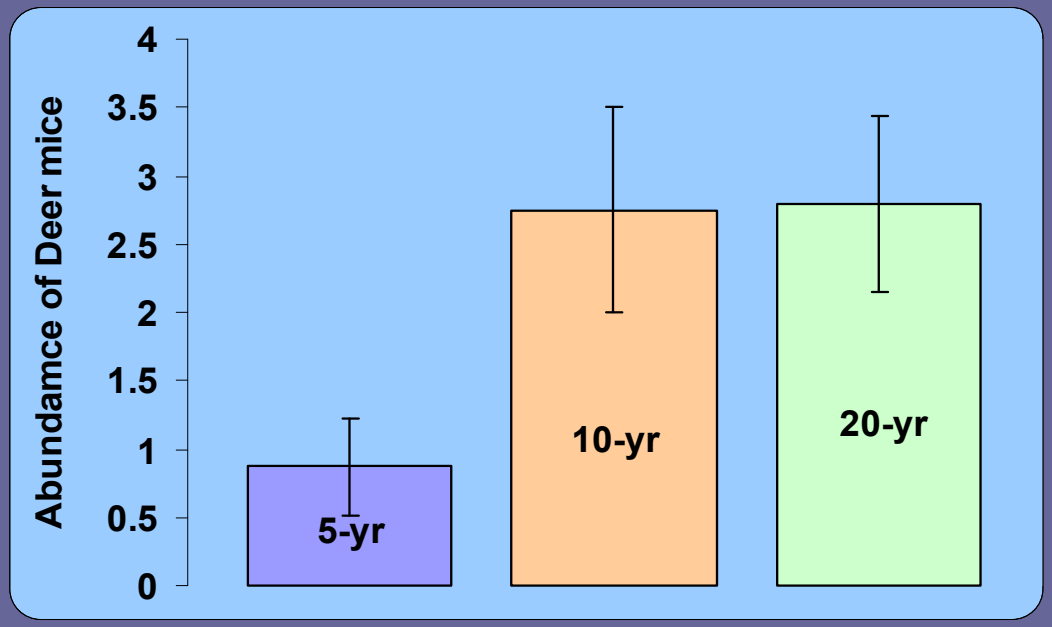
- Significant effect of treatment (p=0.0007)
- Significant effect of Age Class (p=0.02)





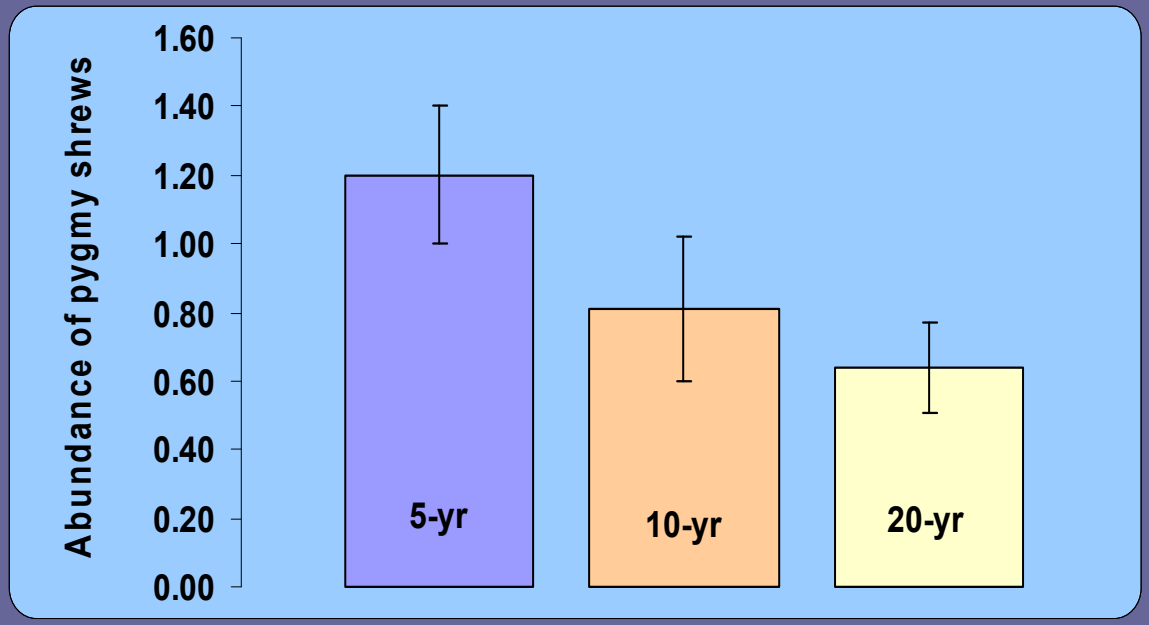
Deer mouse

- No effect of Treatment (p = 0.922)
- Significant effect of Age class (p=0.05)



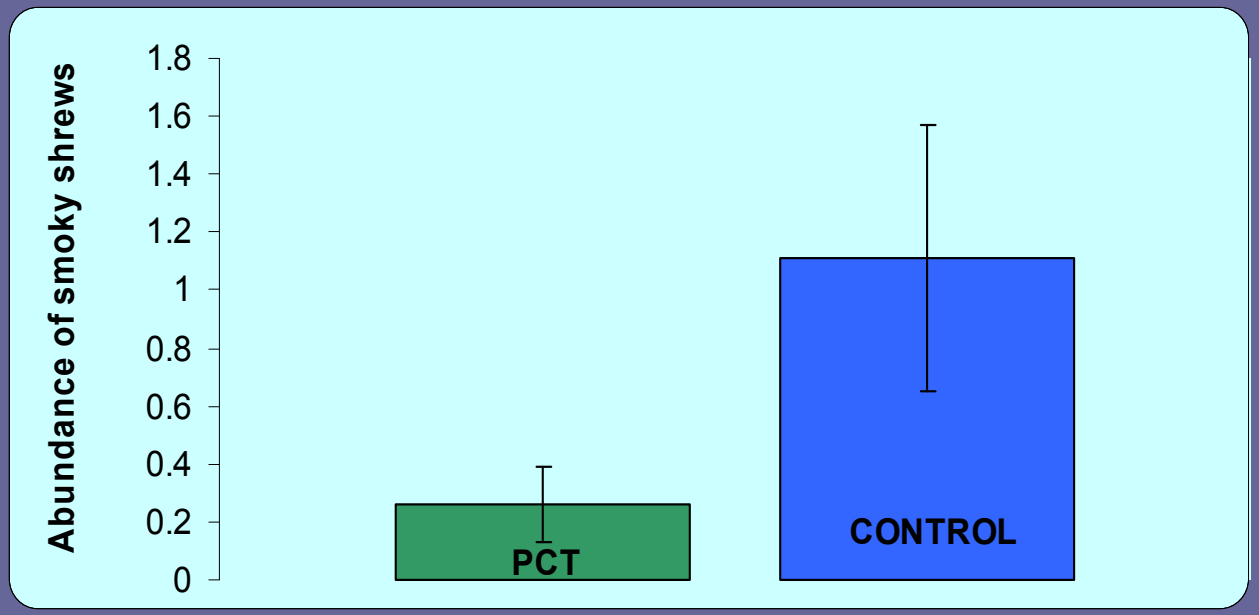
Pygmy shrew

- No effect of Treatment (p=0.685)
- Significant effect of Age class (p=0.02)



Smoky shrew

- No effect of Age class (p=0.992)
- Significant effect of Treatment (p= 0.038)



Maritime shrew

- No effect of treatment ($p = 0.161$)
- Significant effect of Age class ($p = 0.0009$)
- Highest in 5-yr age class
- No captures in 20-yr age class

Predictive variables

Stem density (sw, hw)
Basal area
Canopy closure (sw, hw)
Small stumps
Large stumps
Snags
Debris volume (cwd+stumps+snags)
Microdebris
Moss
Leaf litter
Shrubs
Herbs
Ferns
Seedlings + branches
Total vegetation cover

Model selection

- 18 variables → best-fit variables
- Stepwise selection algorithm
- Akaike's Information Criterion (AIC)
- Model with lowest AIC = "Best"
- "Best" ≠ good
- Adjusted R-squared → variance explained

Predictive models

- Work in progress…
- Interpreting complex interactions
- What is good ?
- Seeking statistical help
- What variables are important

Abundance models

Species	Model variables	Adjusted R-squared
Masked shrew	~ plantcover	0.1385
Red-backed vole	~ snags + largestumps + fern + hwcan + swstems	0.4811
Deer mouse	~ plantcover + hwcan	0.31
Pygmy shrew	~ plantcover	0.1858
Smoky shrew	~ snags + largestumps	0.328

Last slide

- Smoky shrew + rbv influenced by PCT
- Snags and large stumps important to both
- Demo + pygmy, plantcover
- Maritime shrew, endemic to NB, considered wet land associate

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