

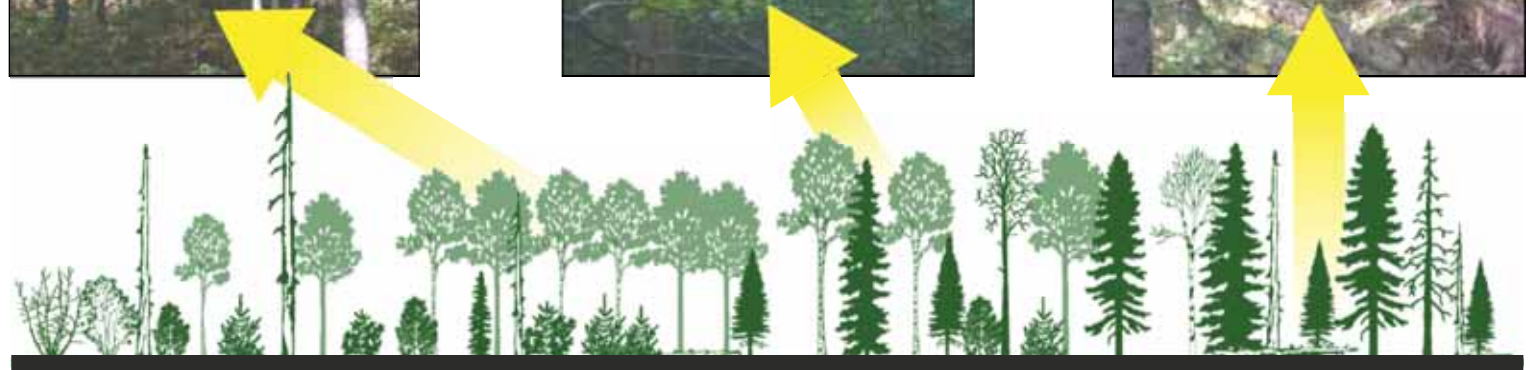
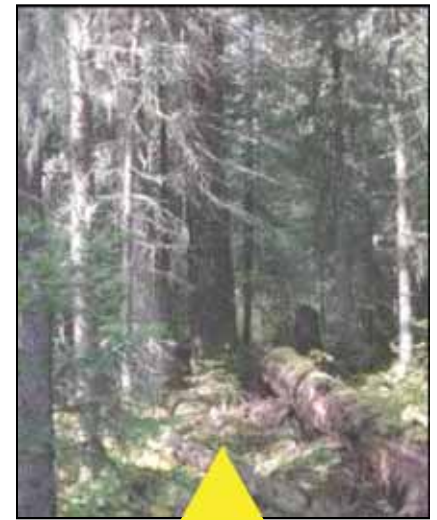


# Patterns of structural response to simulated partial harvesting of boreal mixedwood stands

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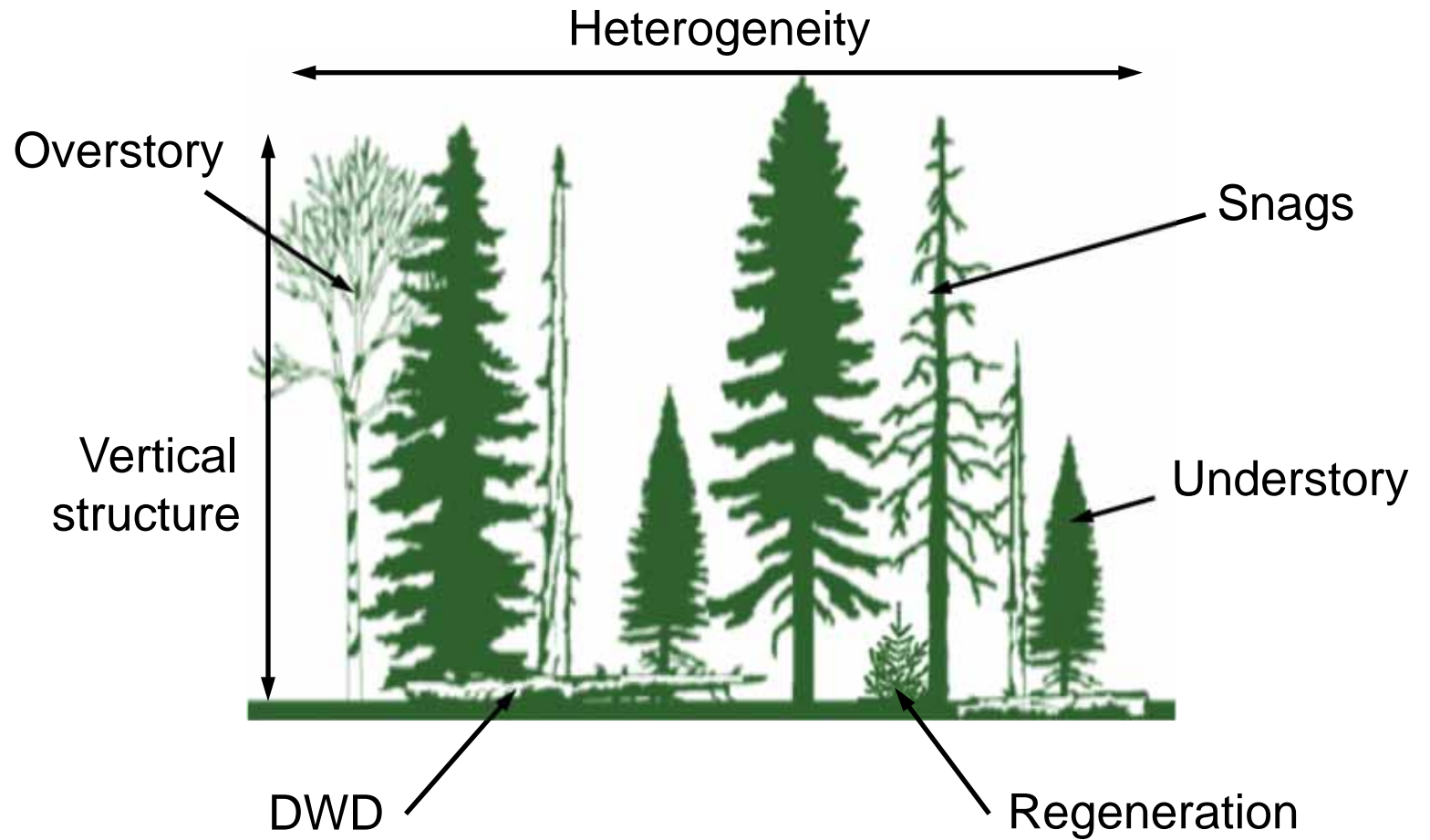
# boreal stand development



Time →

(photos: C. Sharkey; drawings: Chen & Popadiouk 2002)

# habitat structure



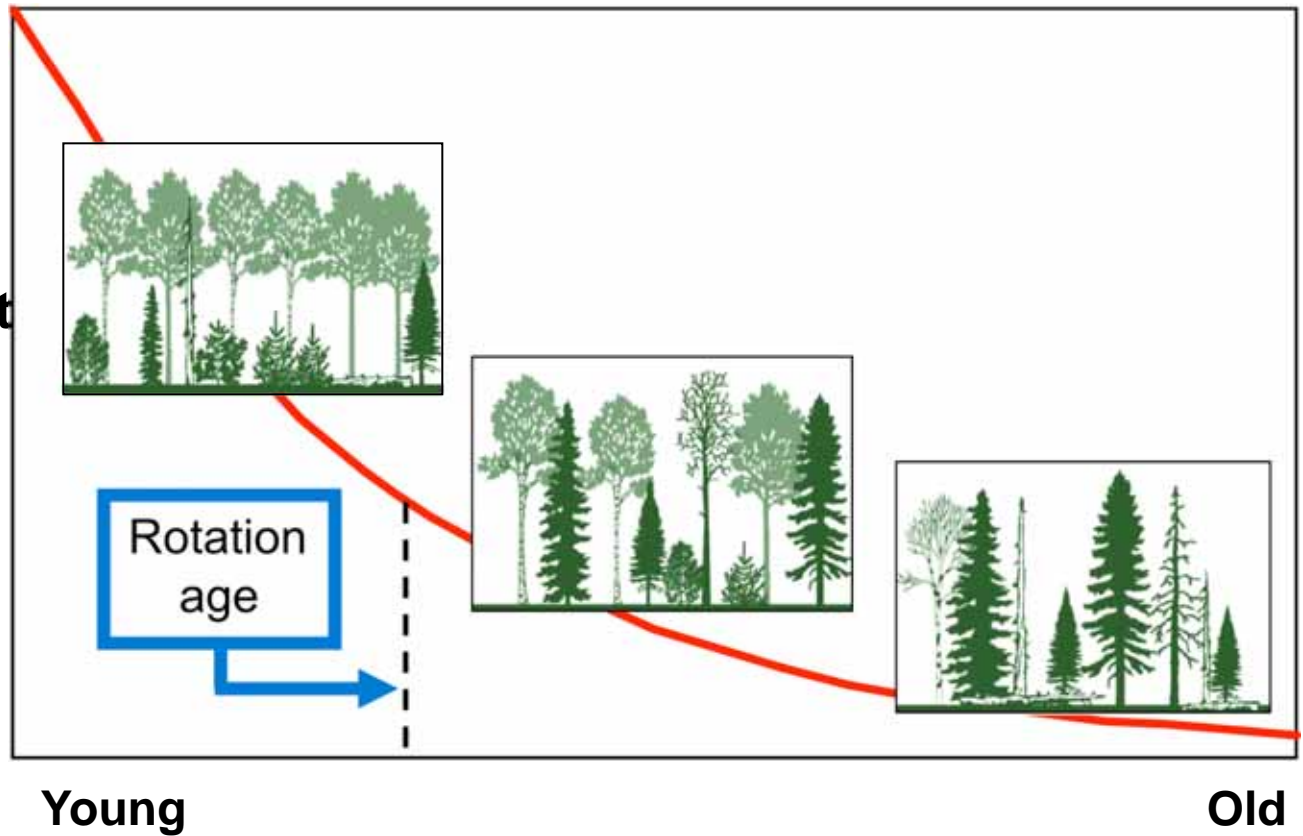
# late-successional species



# forest age distribution



Percent  
of total  
area



# partial harvesting

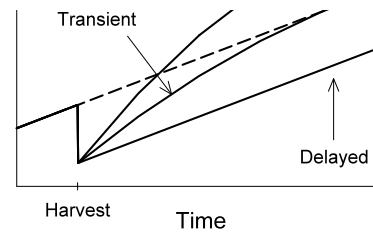
- How might partial harvesting affect structural development in boreal stands?



2/3 partial-cut mixedwood stand



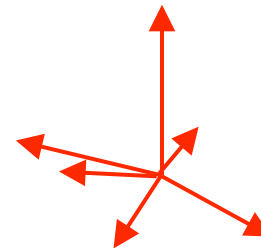
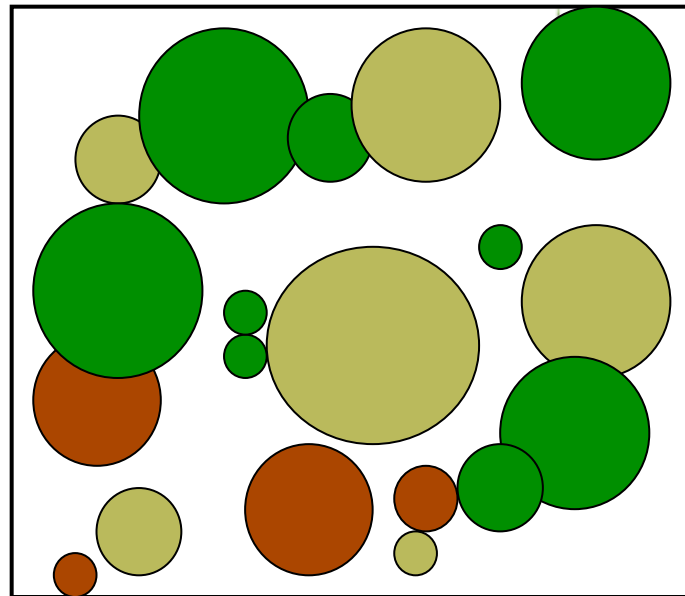
# hypothesized effects



# stand dynamics model

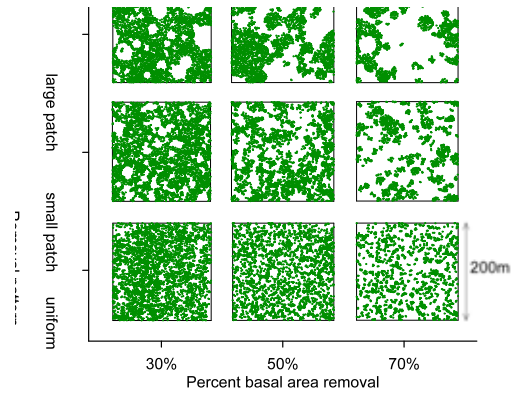
**SORTIE-ND**

Software for spatially-explicit simulation of forest dynamics





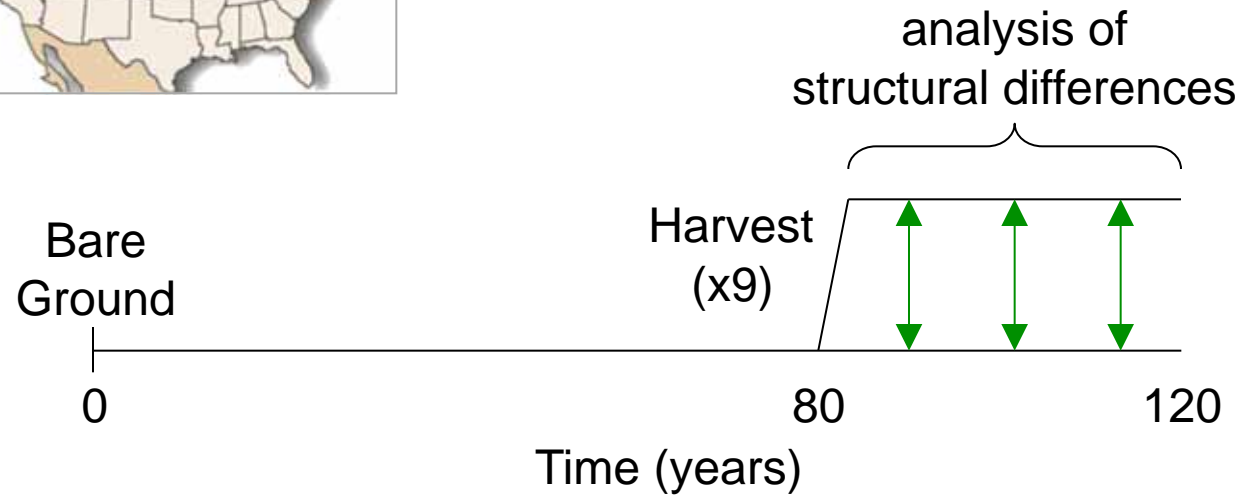
# partial harvest scenarios



# simulations & model output



Boreal mixedwood stands dominated by *Populus tremuloides*



Overstory  
Understory  
Regeneration

Dead wood  
Vertical structure  
Heterogeneity

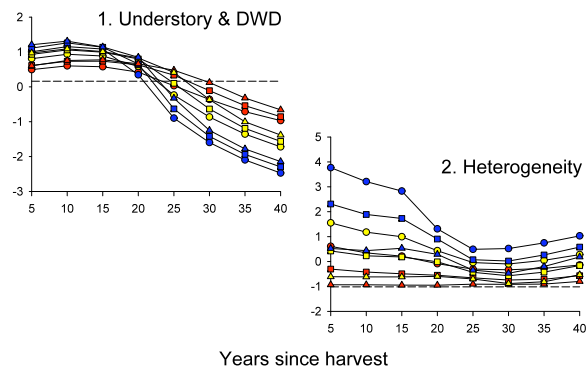
37 variables  
→ factor analysis



# habitat models

<b>Species</b>	<b>Can Cov</b>	<b>Height</b>	<b>Lg trees</b>	<b>Snags</b>	<b>Saplings</b>	<b>DWD</b>
Redback salamander	<b>X</b>					<b>X</b>
Brown creeper			<b>X</b>	<b>X</b>		
Ovenbird	<b>X</b>					
Least flycatcher	<b>X</b>				<b>X</b>	
Red-backed vole					<b>X</b>	<b>X</b>
Northern flying squirrel			<b>X</b>			<b>X</b>
American marten	<b>X</b>	<b>X</b>				<b>X</b>

# structure trends

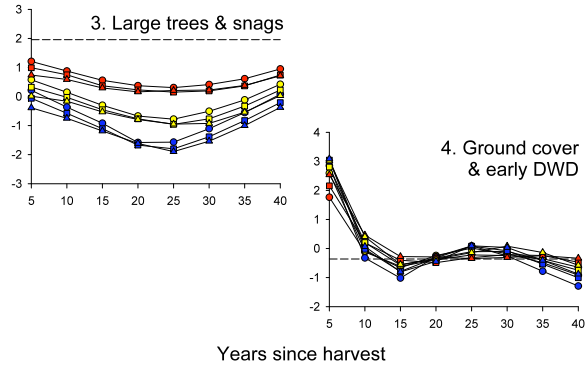


Unharvested

30% rem  
50% rem  
70% rem



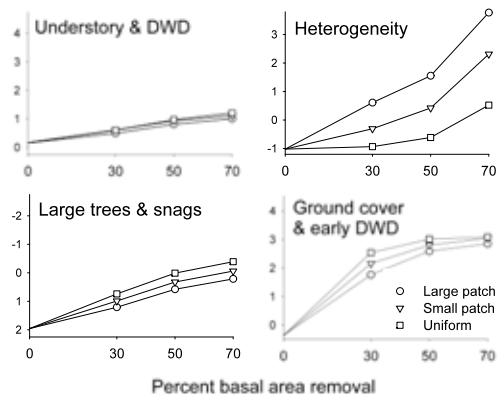
# structure trends



Unharvested

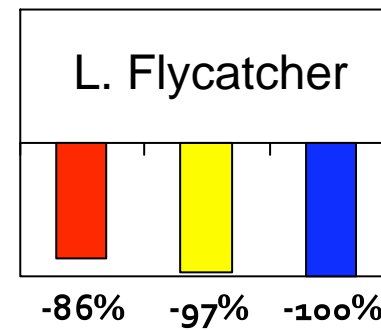
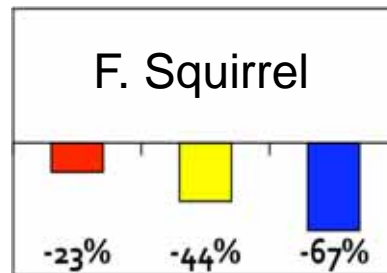
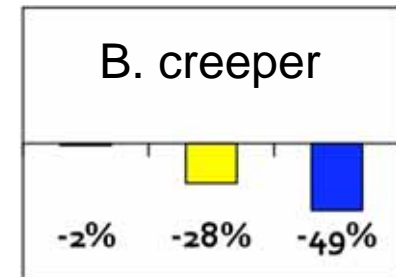
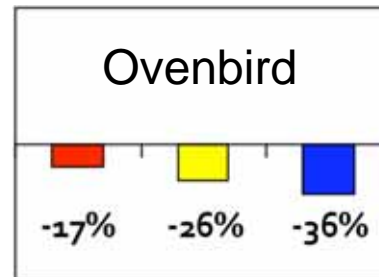
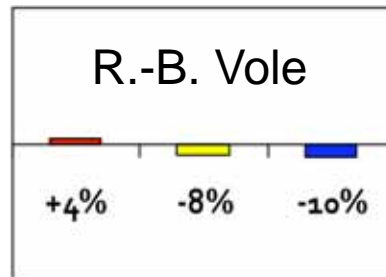
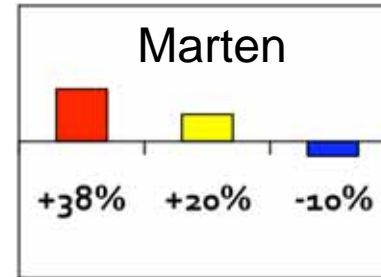
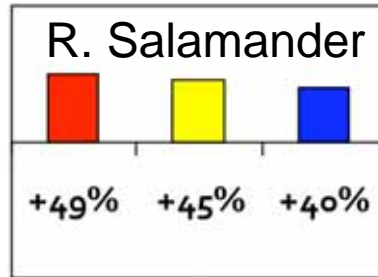
30% rem  
50% rem  
70% rem

# 5-year impacts





# species responses



30% rem  
50% rem  
70% rem

# canopy turnover

partial harvesting

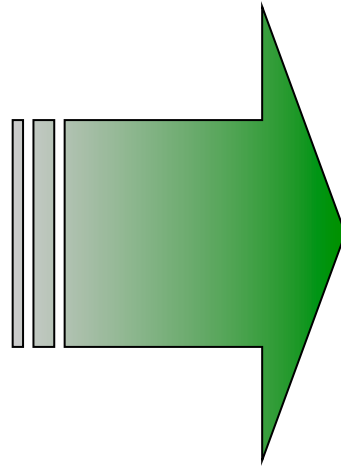
promotes  
canopy  
turnover

enhances  
gap-related  
structure





# snag & large tree retention





# fostering complex structure

- Light/moderate intensity harvesting
- Aggregated harvest patterns
- Retain snags, large trees, DWD



# acknowledgements

- Sustainable Forest Management Network
- Forestry Futures Trust
- OMNR, Tembec, Lake Abitibi Model Forest
- NSERC
  
- Christian Messier, Mike Papaik, Marilou Beaudet, Julie Poulin, Virginie Angers
- Lora Murphy, Charlie Canham

