Biodiversity, structure and process: changes in saproxylic beetles, deadwood and decomposition rates following forest harvest.

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Wood based food webs

- Predators
- Fungivores
- Xylophages
- Fungi
- Dead Wood
- Environment
- Structure

Diagram showing interactions between different components of a wood-based food web.
RECPA
(le réseau d’expérimentation de coupes partielles en Abitibi)

Uncut Controls
Partial cuts †
Operational cuts † *

†Cuts we carried out in the winters 4 and 5 years before sampling
* CPRS (coupes partial avec protection de la régénération et des sol)
Dead Wood Decomposition rates

- Control $t_{95}=75$ years
- Partial cut $t_{95}=59$ years
- Operational cut $t_{95}=51$ years

Wood density (g/cm³)

Time since death (years)

Mass of deadwood (Mg)

Time since disturbance (years)
Dead Wood

Decomposition rates

<table>
<thead>
<tr>
<th>Wood density (g/cm³)</th>
<th>0.0</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time since death (years)</td>
<td>0</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
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- Control: $t_{95}=75$ years
- Partial cut: $t_{95}=59$ years
- Operational cut: $t_{95}=51$ years

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<thead>
<tr>
<th>Mass of deadwood (Mg)</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
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<td>Time since disturbance (years)</td>
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- 0% retention: $t_{95}=40$ ans
- 25% retention: $t_{95}=143$ ans
- 50% retention: $t_{95}=180$ ans

- 0% retention: $t_{95}=29$ ans
- 25% retention: $t_{95}=119$ ans
- 50% retention: $t_{95}=170$ ans
Dead Wood

Decomposition rates

$r^2=0.56$
$P=0.02$

$r^2=0.37$
$P=0.08^{**}$
Fungi

Gloeophyllum sepiarium

Predicted proportion of logs with fruiting body + SE

Control
Partial cut
Operational cut

Predicted proportion with fruiting bodies + SE

Snags
Leaning snags
Elevated logs
Logs
Buried logs
Natural stumps
Cut stumps
PermMANOVA

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<tr>
<th></th>
<th>DF</th>
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<th>MS</th>
<th>F</th>
<th>R2</th>
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<td>Treatment</td>
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<td>0.52</td>
<td>0.26</td>
<td>2.60</td>
<td>0.47</td>
<td>0.006**</td>
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Fungivores
abundance = 2691
richness = 109

P_{DWD} = 0.06

Predators
abundance = 1469
richness = 67

P_{Treatment} = 0.03*

Xylophages
abundance = 1120
richness = 50

P_{BA} = 0.01*

- Control
- Partial cut
- Operational cut
Fungivores

**Atheta ventricosa**

- $n=125$
- ANOVA, $P=0.03$

**Corticaria sp. nov.**

- $n=34$
- ANOVA, $P=0.02$

The bar charts show the catch rate (beetles/day) across different treatments: Control, Partial cut, and Operational cut.
Wood based food webs

- Predators
  - More predators

- Fungivores
  - Increased fungal growth

- Xylophages
  - Increased beetle activity

- Fungi
  - Increased fungal growth
  - Increased decay rates

- Dead Wood
  - Increased decay rates

- Environment
  - Dryer

- Structure
  - Canopy opens
Merci

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