Beavers (*Castor* spp.) as a tool to enhance biodiversity across multiple taxa

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10th INTERNATIONAL BEAVER SYMPOSIUM SCOTLAND 2025

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Beavers are ecosystem engineers that shape wetland biodiversity

Lodge building

Tree cutting

Canal digging

Dam building

Beaver floods & succession

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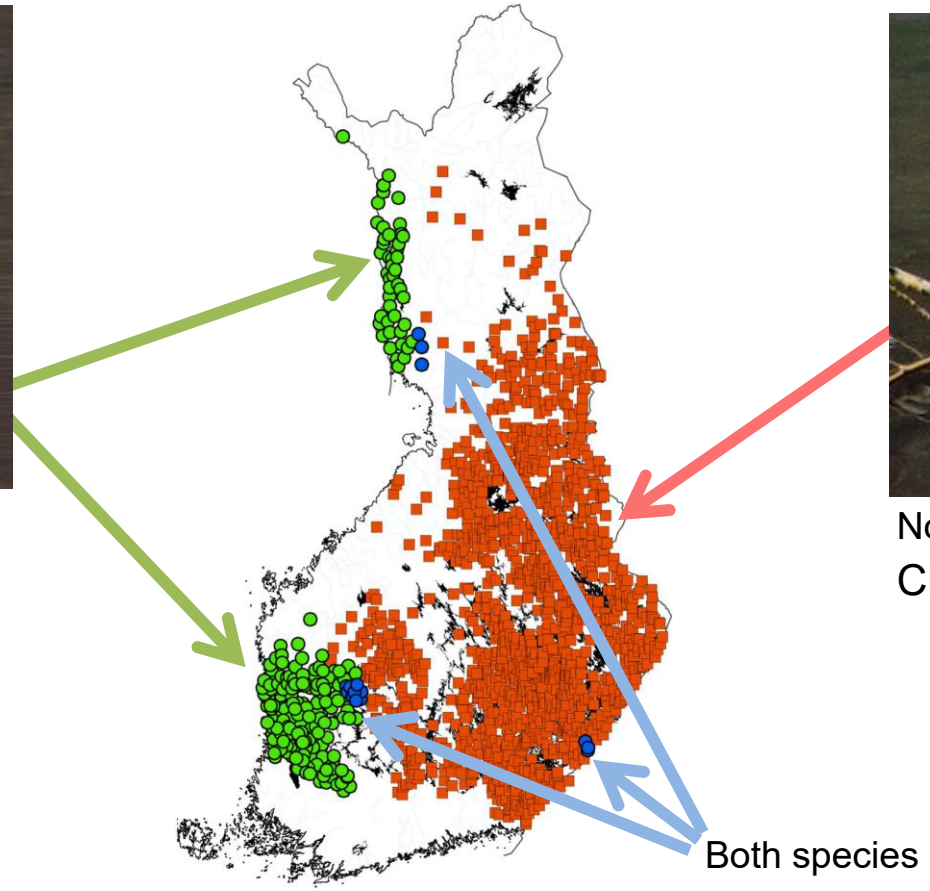
Finland has two beaver species, which have similar impacts on their environment

Eurasian beaver *(Castor fiber)*

Chromosome N = 48



North American beaver *(Castor canadensis)*

Chromosome N = 40

Iso-Touru et al (2021) *Wildlife Biology* 3: wlb-00808

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We studied multi-taxa in a beaver-influenced landscape

Mammals at:

10 beaver sites

10 control sites

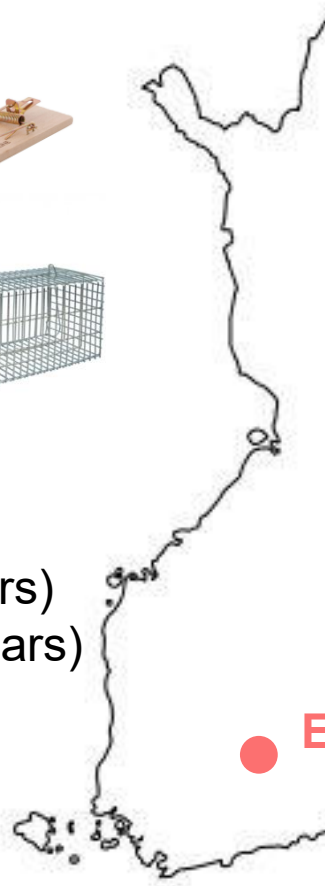
Water beetles at:

5 new beaver ponds (2 – 4 years)

5 old beaver ponds (7 – 33 years)

5 abandoned beaver ponds

5 never-engineered ponds



North American beaver *(Castor canadensis)*

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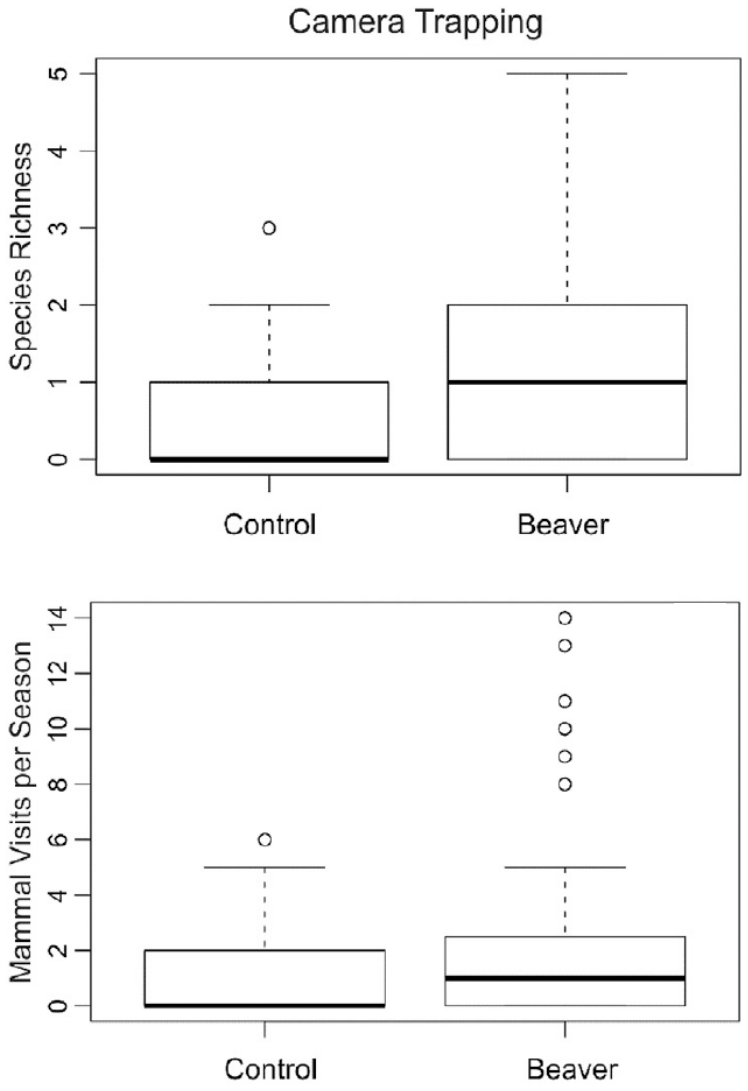
Mammals visit beaver sites more frequently than non-beaver sites



Nummi et al 2019 *Global Ecology and Conservation* 20: e00701.

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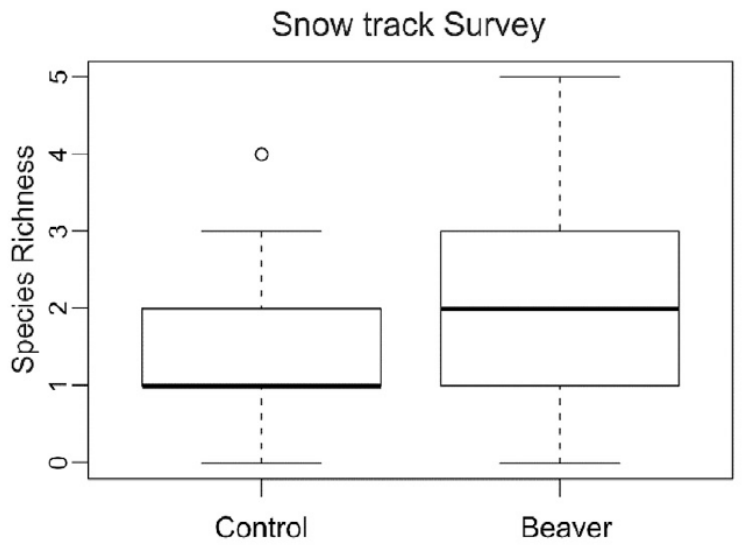

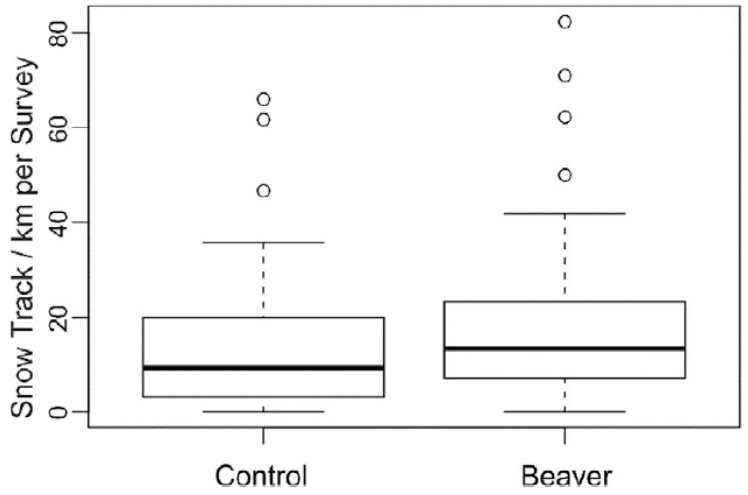

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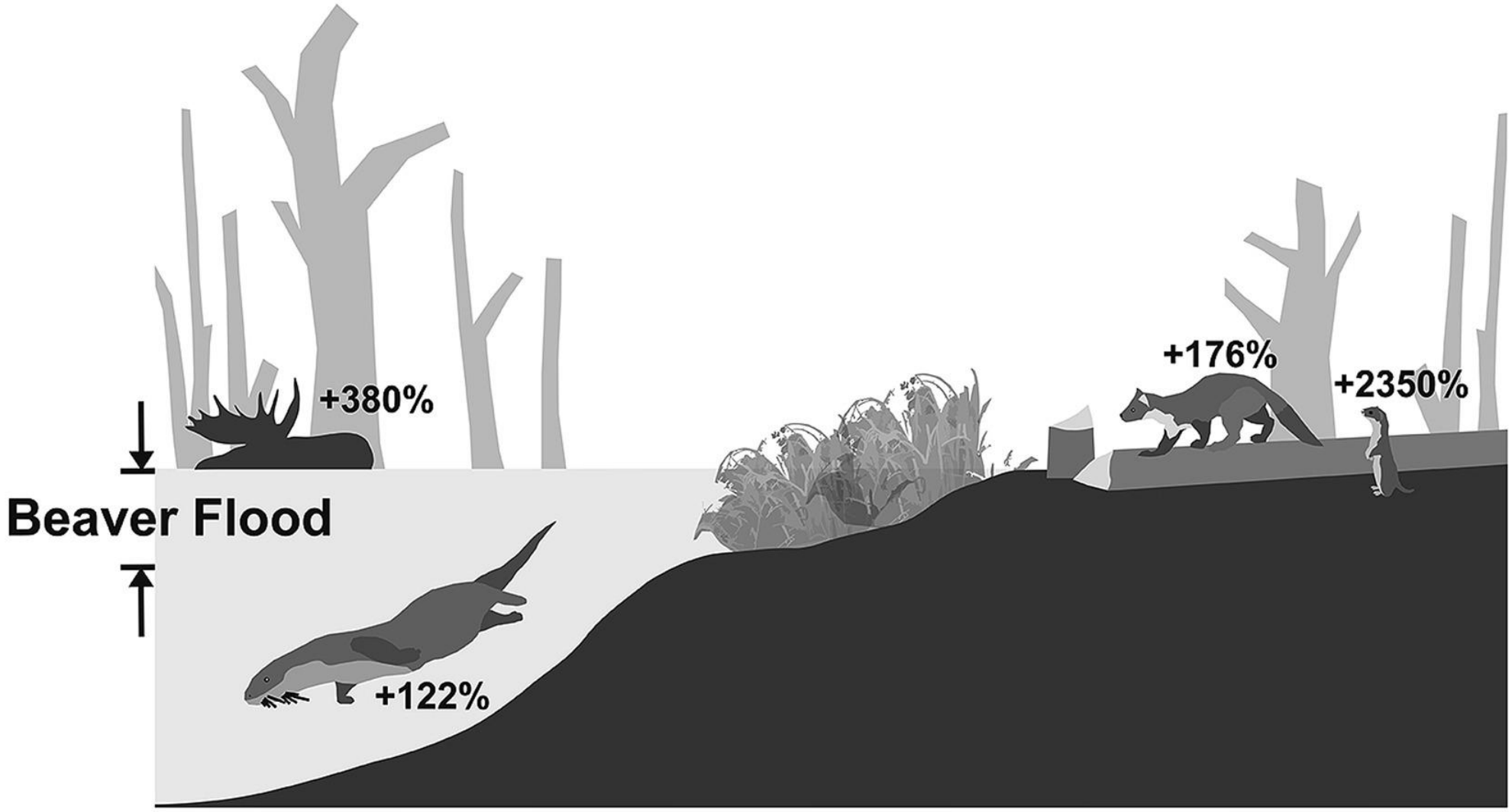
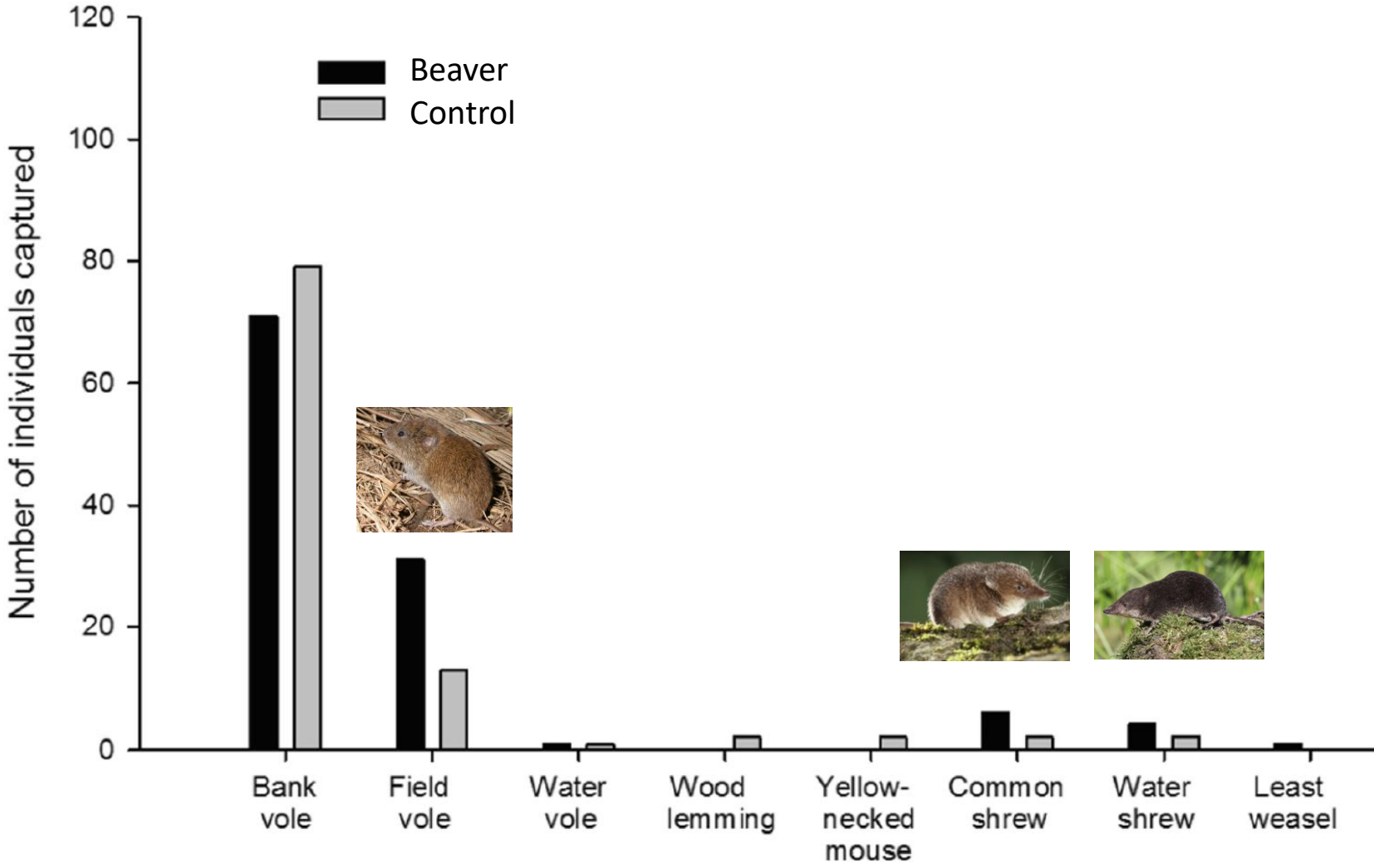


Nummi et al 2019 *Global Ecology and Conservation* 20: e00701.

Small mammals show different species composition at beaver and non-beaver sites



Sundell et al (2021) *Mammal research 66:* 181-186.

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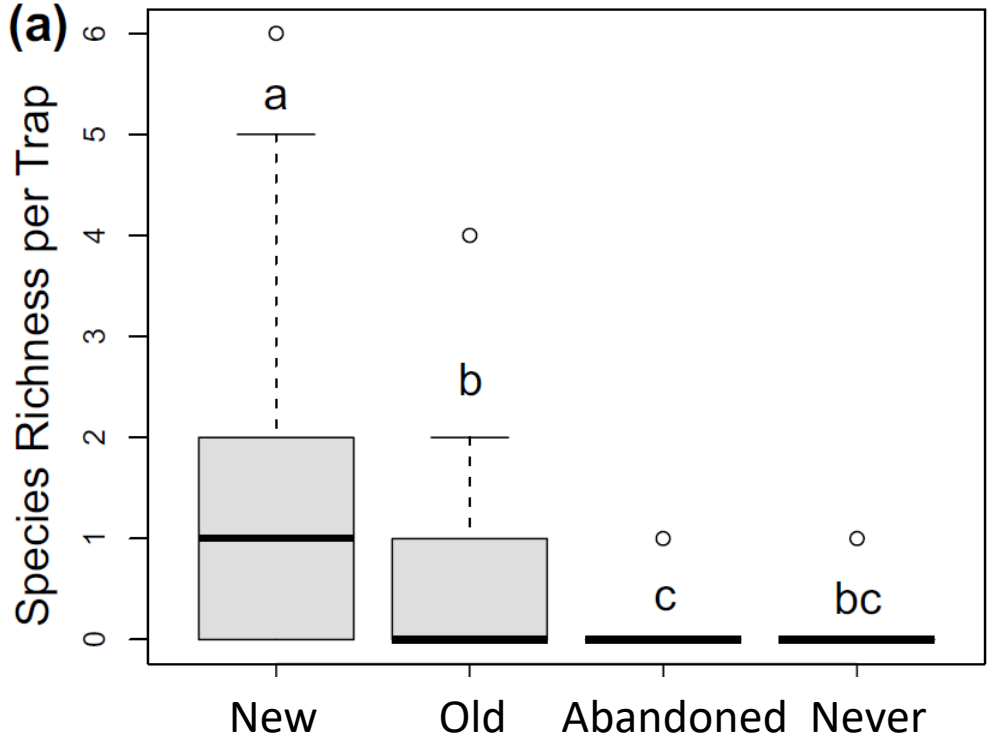
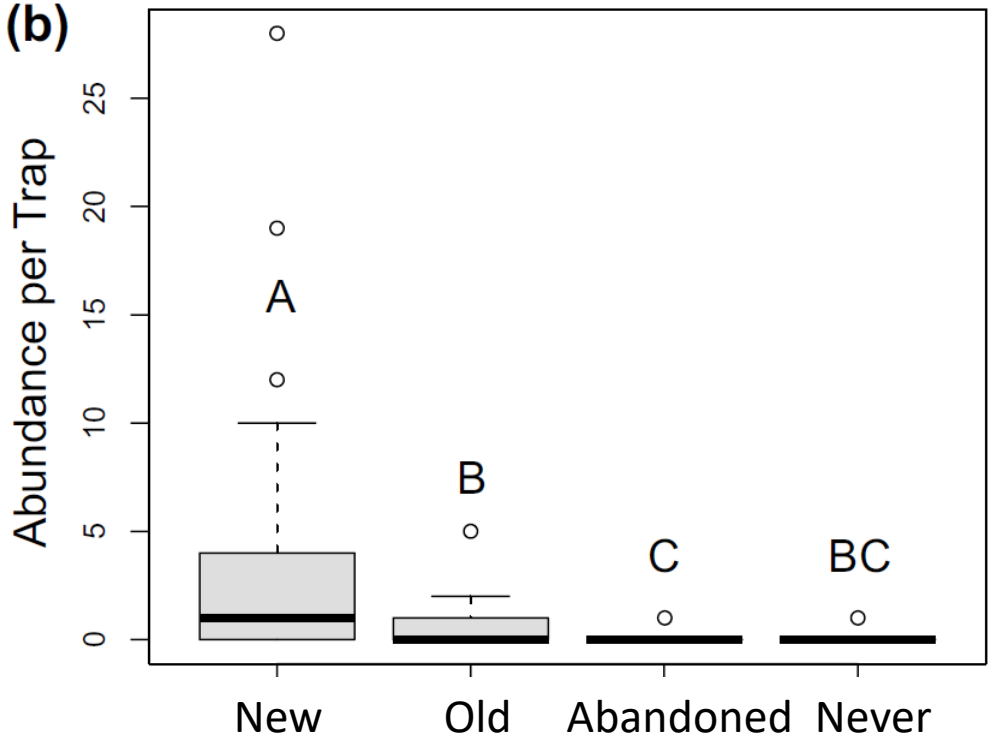
New beaver ponds support most water beetles





Nummi et al (2021) *Biodiversity and Conservation 30*: 2655-2670.

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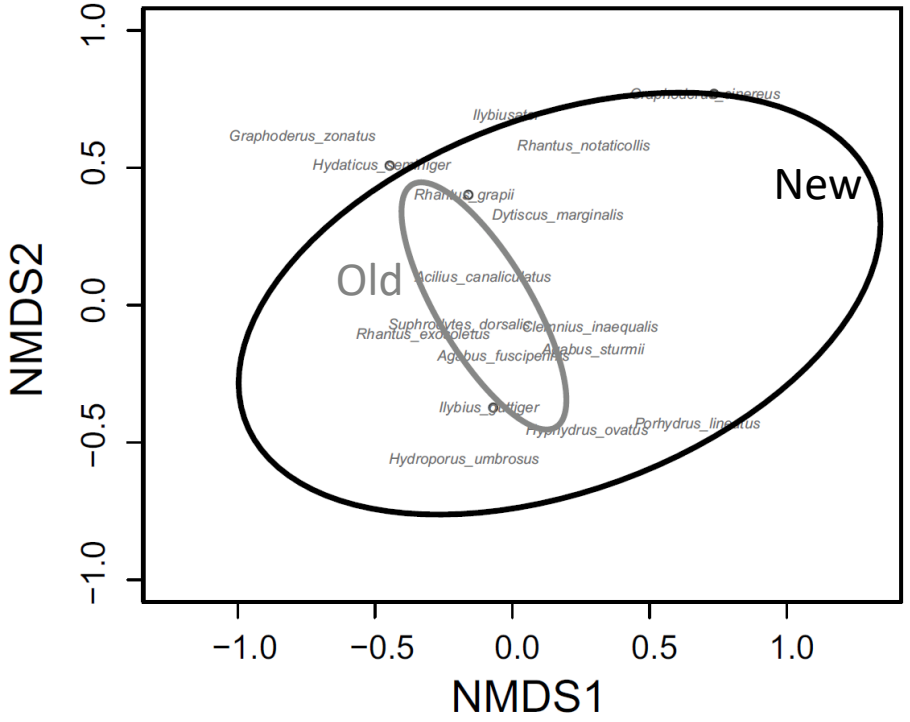
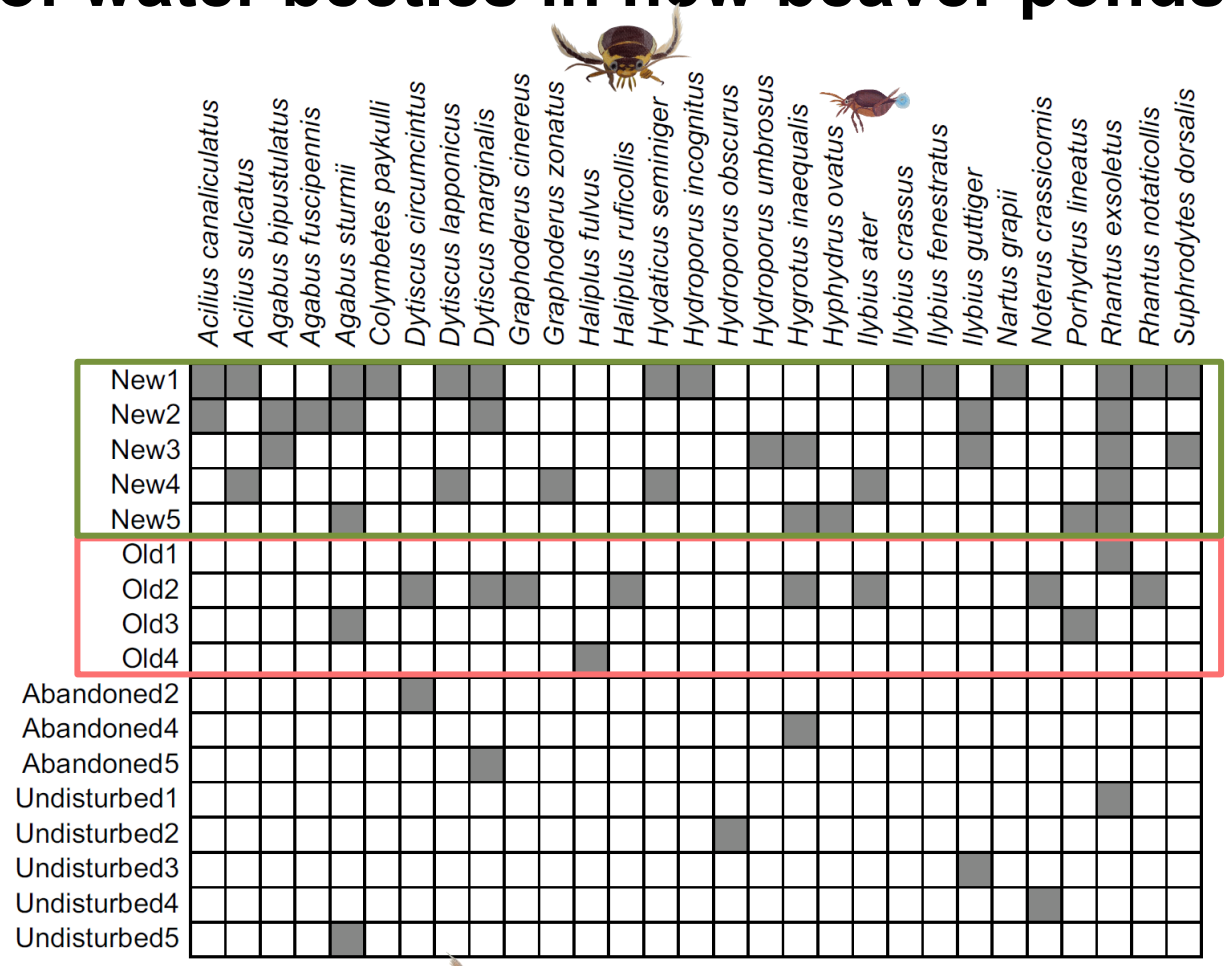
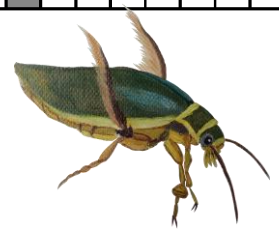
Old beaver ponds had a subset of water beetles in new beaver ponds







Nummi et al (2021) *Biodiversity and Conservation 30*: 2655-2670.

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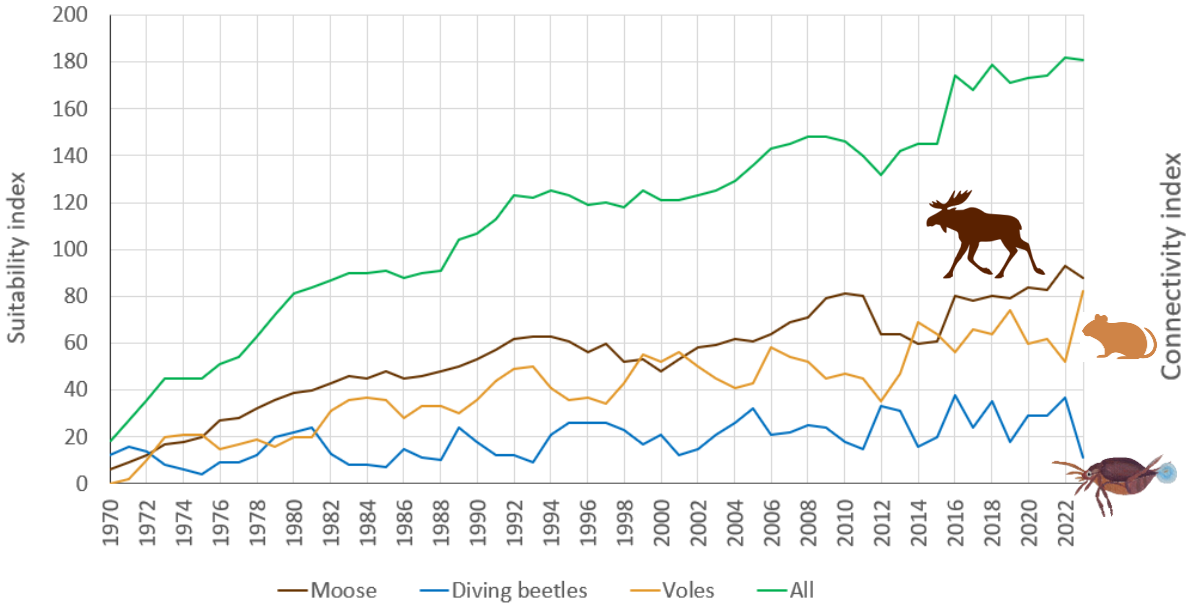
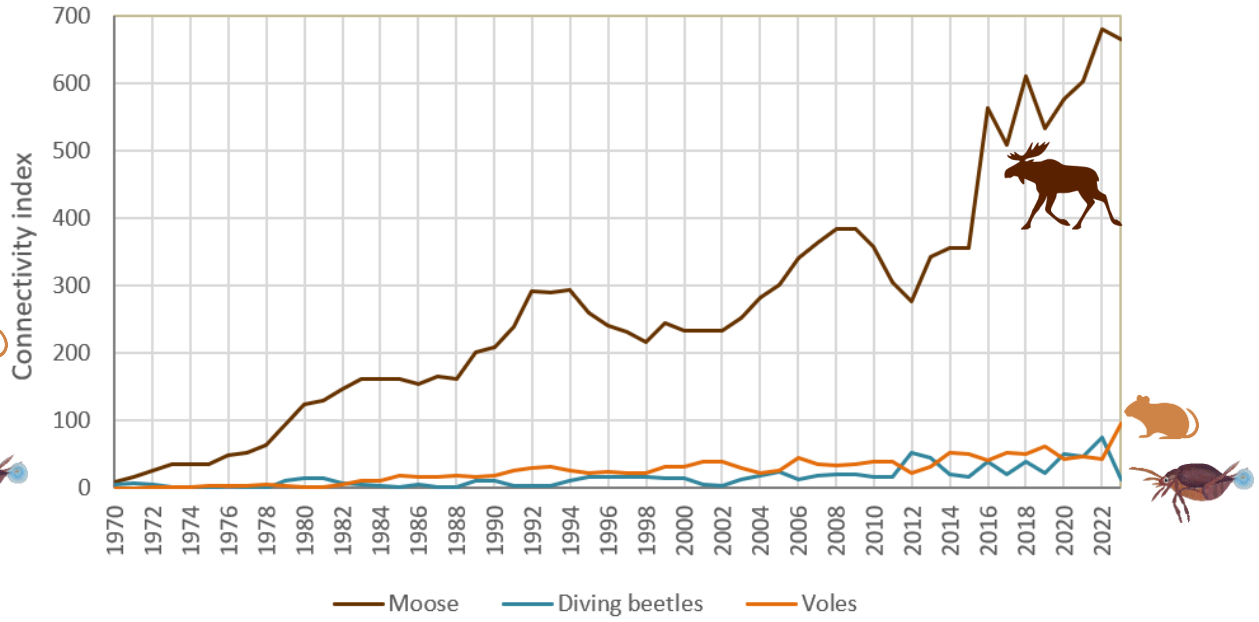
Beavers improve habitat suitability and connectivity in the landscape

2 = post-flood 4 – 10 years
2 = post-flooded 1 – 3 years
2 = flooded 1 – 3 years

1 = post-flood 1 – 3 years
1 = post-flooded 4+ years
1 = flooded 4+ years

0 = never flooded/post-flood lasted 10+ years
0 = never flooded/currently flooded
0 = never flooded/currently post-flooded





Kivinen, S., & Nummi, P. (2025). *Science of The Total Environment 999*: 180341.

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Conservation Implications

Beavers as tools:

- Create beneficial habitat features for multiple taxa
- Promote habitat mosaics (critical for biodiversity)

Management caveats:

- Monitor densities to ensure patch turnover
- Balance with forest specialist needs

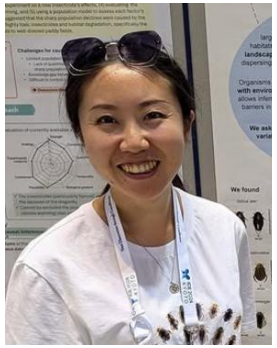
Thank you for your attention ☺

Leading authors

Petri Nummi

Janne Sundell

Sonja Kivinen



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