

# Rewilding landscapes. Can beaver-created heterogeneity influence biodiversity and alter connectivity?



**Alan Law**

Nigel Willby, David Bryan, Tom Spencer, Lori Lawson Handley, Garth Foster, Wenfei Liao & Petri Nummi





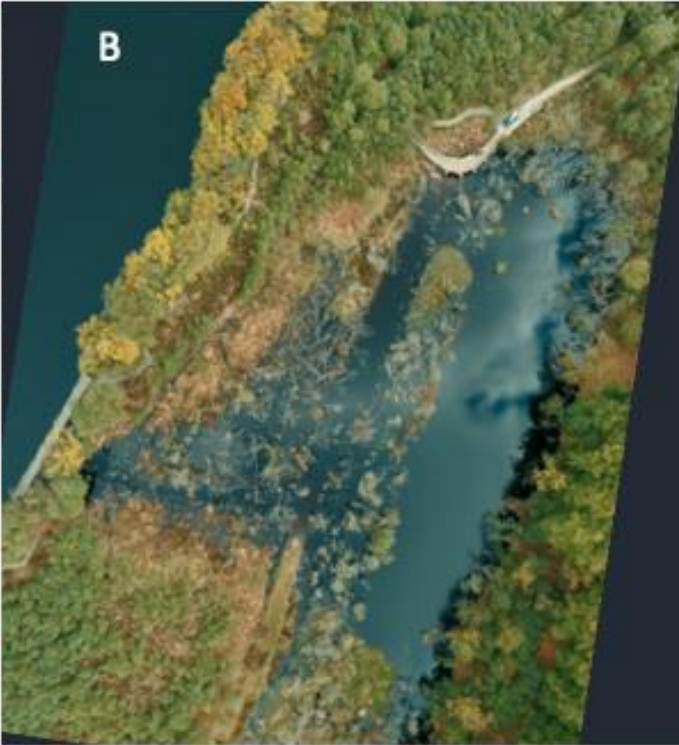
# Beaver engineering

- Choosy, generalist vegetarians





# Beaver engineering

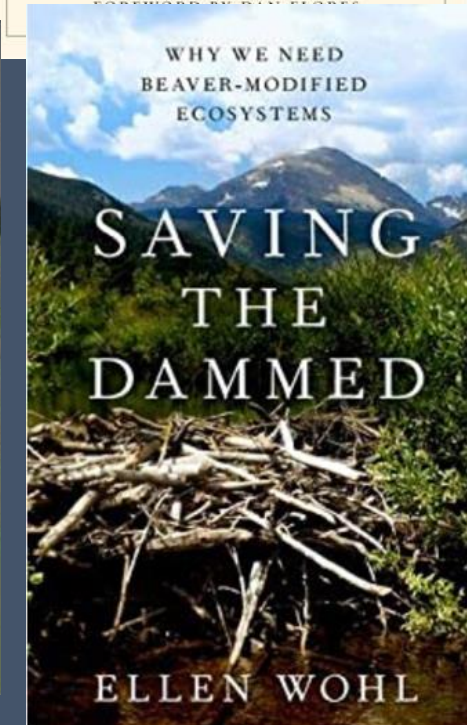
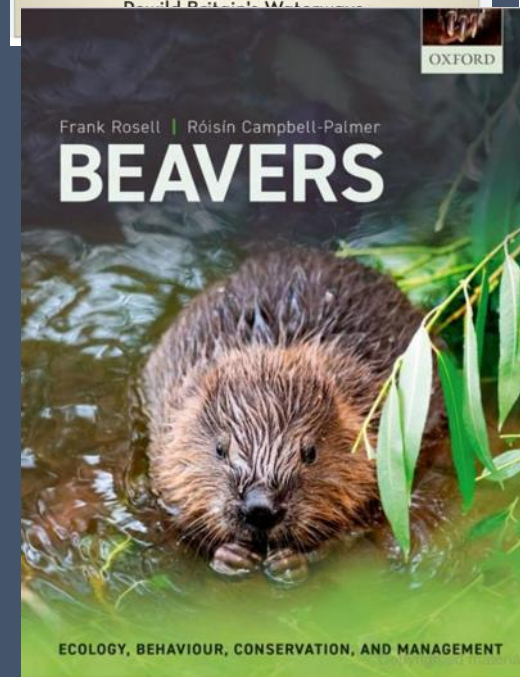
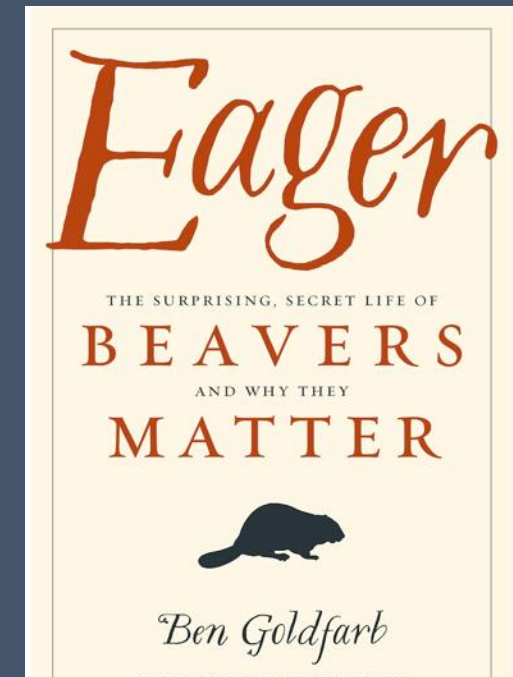


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# The effects of mess

- Biodiversity boosts.
- Restore hydrogeomorphology.
- Mitigating water extremes (flood and drought).
  
- Lacking landscape and long-term studies.



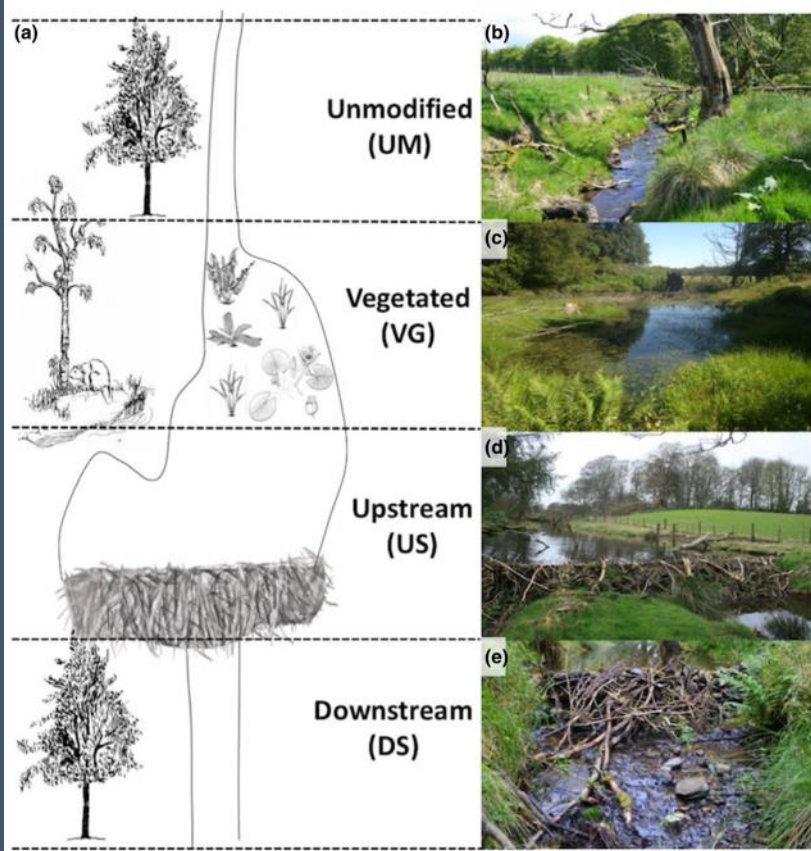


# Project influence

## Habitat engineering by beaver benefits aquatic biodiversity and ecosystem processes in agricultural streams

ALAN LAW, FIONA MCLEAN AND NIGEL J. WILLBY

*Biological and Environmental Sciences, School of Natural Sciences, University of Stirling, Stirling, U.K.*



Increased invertebrate richness at the landscape scale; gamma diversity was 28% higher

Species unique to beaver ponds was 50% higher than those unique to other wetlands

## Rewilding wetlands: beaver as agents of within-habitat heterogeneity and the responses of contrasting biota

Nigel J. Willby<sup>1</sup>, Alan Law<sup>1</sup>, Oded Levanoni<sup>2</sup>, Garth Foster<sup>3</sup> and Frauke Ecke<sup>2,4</sup>



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# Project influence II

- Biodiversity + heterogeneity + *connectivity*
- Multiple species + multiple wetlands

LETTER • OPEN ACCESS

## Beaver-induced spatiotemporal patch dynamics affect landscape-level environmental heterogeneity

Sonja Kivinen<sup>1,2</sup> , Petri Nummi<sup>3</sup> and Timo Kumpula<sup>1</sup>

Published 27 August 2020 • © 2020 The Author(s). Published by IOP Publishing Ltd

[Environmental Research Letters](#), Volume 15, Number 9

Citation Sonja Kivinen et al 2020 *Environ. Res. Lett.* 15 094065

DOI 10.1088/1748-9326/ab9924

## Populations in stable and variable habitats: Green and common sandpiper in a beaver-influenced landscape

Petri Nummi <sup>a</sup>, Céline Arzel <sup>b</sup> , Virva Sauramo <sup>a</sup>

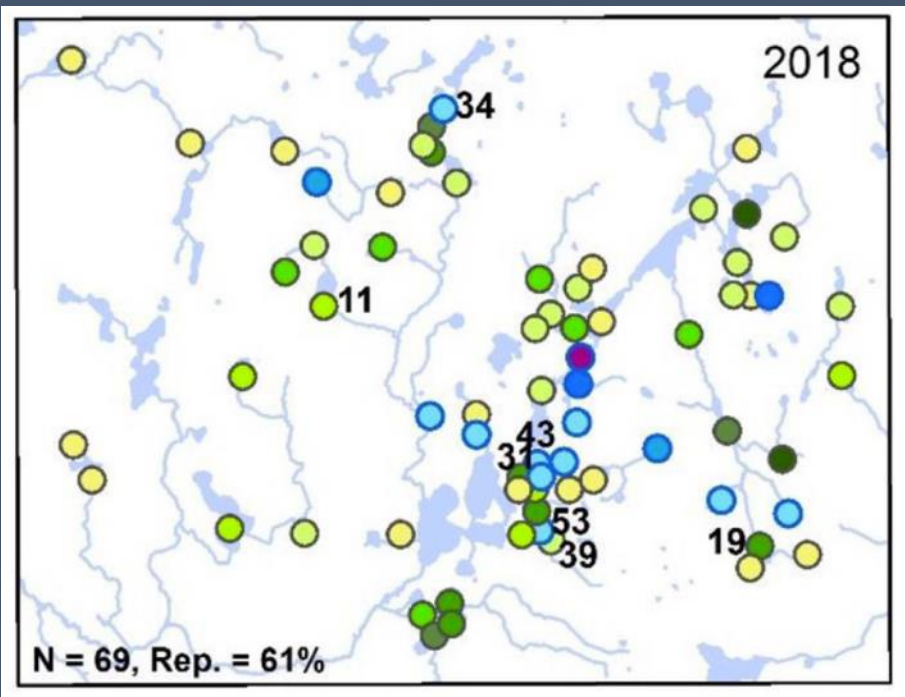
Original Paper | [Open Access](#) | [Published: 04 November 2020](#)

## Small mammal assemblage in beaver-modified habitats

Janne Sundell , Wenfei Liao & Petri Nummi

[Mammal Research](#) 66, 181–186 (2021) | [Cite this article](#)

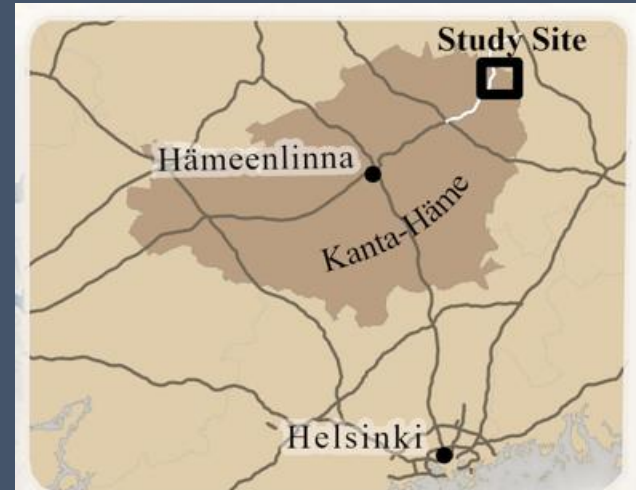
1639 Accesses | 6 Citations | 6 Altmetric | [Metrics](#)



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# Evo, boreal Finland







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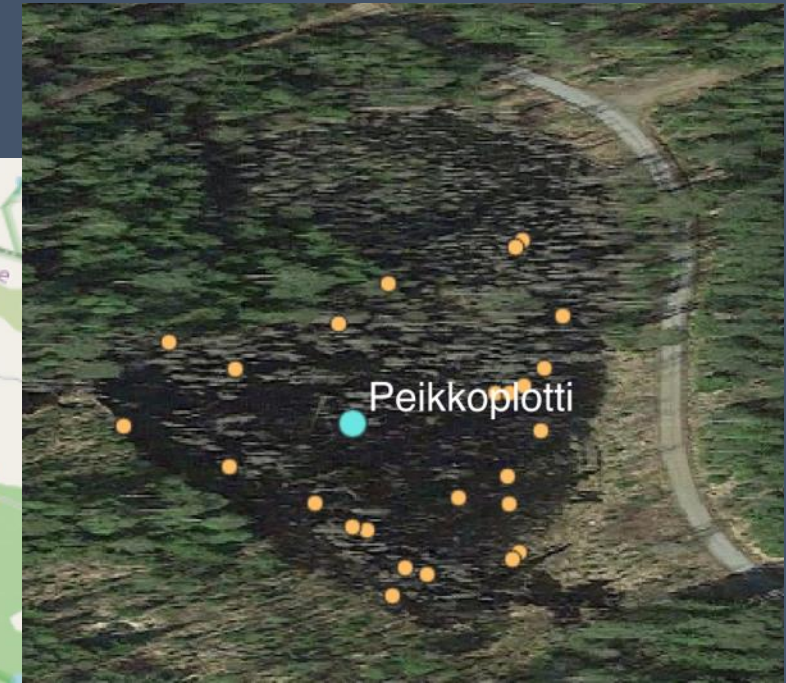


# Study design

- 12 days in August 2022
  - 9 beaver-created (blue) and 9 control (red) wetlands

## Per wetland:

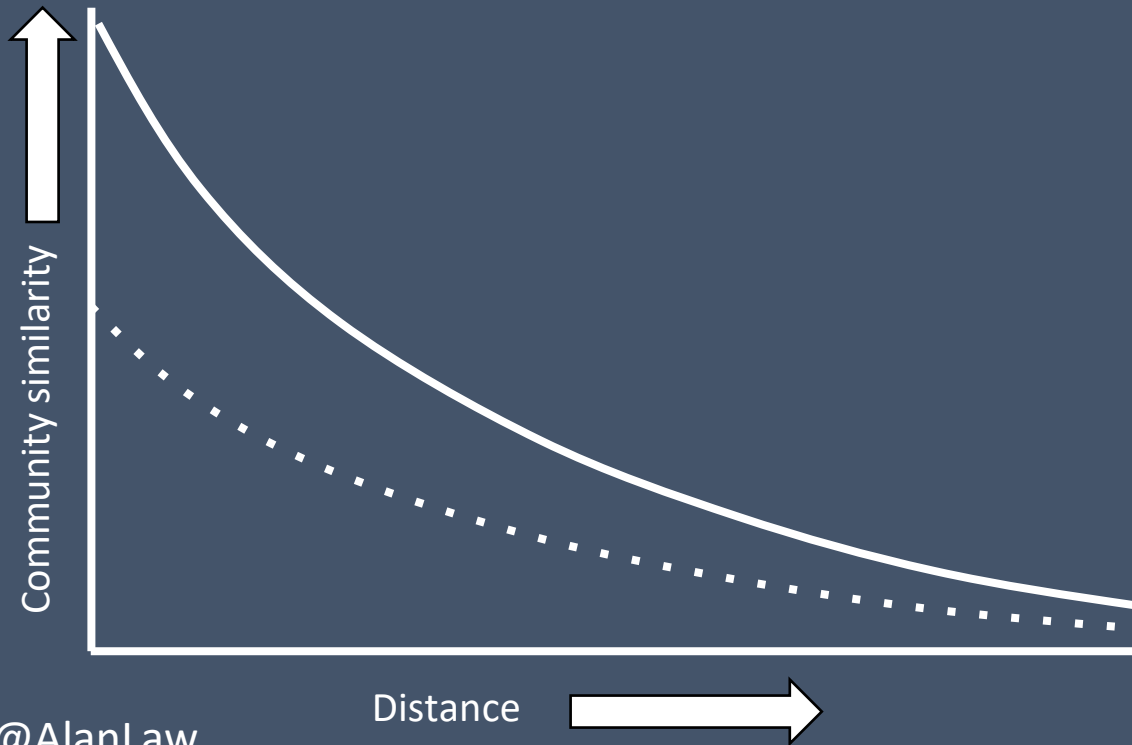
- Plants – 25 \* 2x2m quadrats
  - No. of species and coverage
- Beetles – 6 \* 2x2m quadrats
- eDNA – 10 equidistant perimeter samples (verts + inverts)
- Supporting water chemistry





# Beyond the pond

- Can beaver-created heterogeneity influence biodiversity and **alter connectivity**?
- Distance decay theory
  - The closer you are the more similar you are.





# Discussion points

- Can beaver-created heterogeneity influence biodiversity and alter connectivity?
  - Beavers create wetlands with species that persist nowhere else in the landscape.
  - Distances of <10 km do not appear enough to detect a decay effect.
- eDNA is complementary to archaic luddites.
  - Limited eDNA data for odonata.
  - Long processing times (still to process invert eDNA).
- Even in a wetland-rich landscape, beavers have positive and unique effects.



# Thanks for listening



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