

Give our waters a helping hand!

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On behalf of:

IUFRO Task Force on Forest and Water

IUFRO Div. 3.05 – Forest Operation-Ecosystem

SNS Net-work – PROFOR (Promoting Forests)

COST Action PESFor-W (Payment for Ecosystem Services
Forest – Water)

Film project – Our Common Water

WAMBAF – Water Management in the Baltic Sea forest Area



skogforsk



SusFor 

PROFOR

Promoting sustainable forestry
in a growing bioeconomy



Photo: Lars Högbom if not stated otherwise



From Precision ...



ACQUEDOTTO
COMUNALE
DI
PADOVA



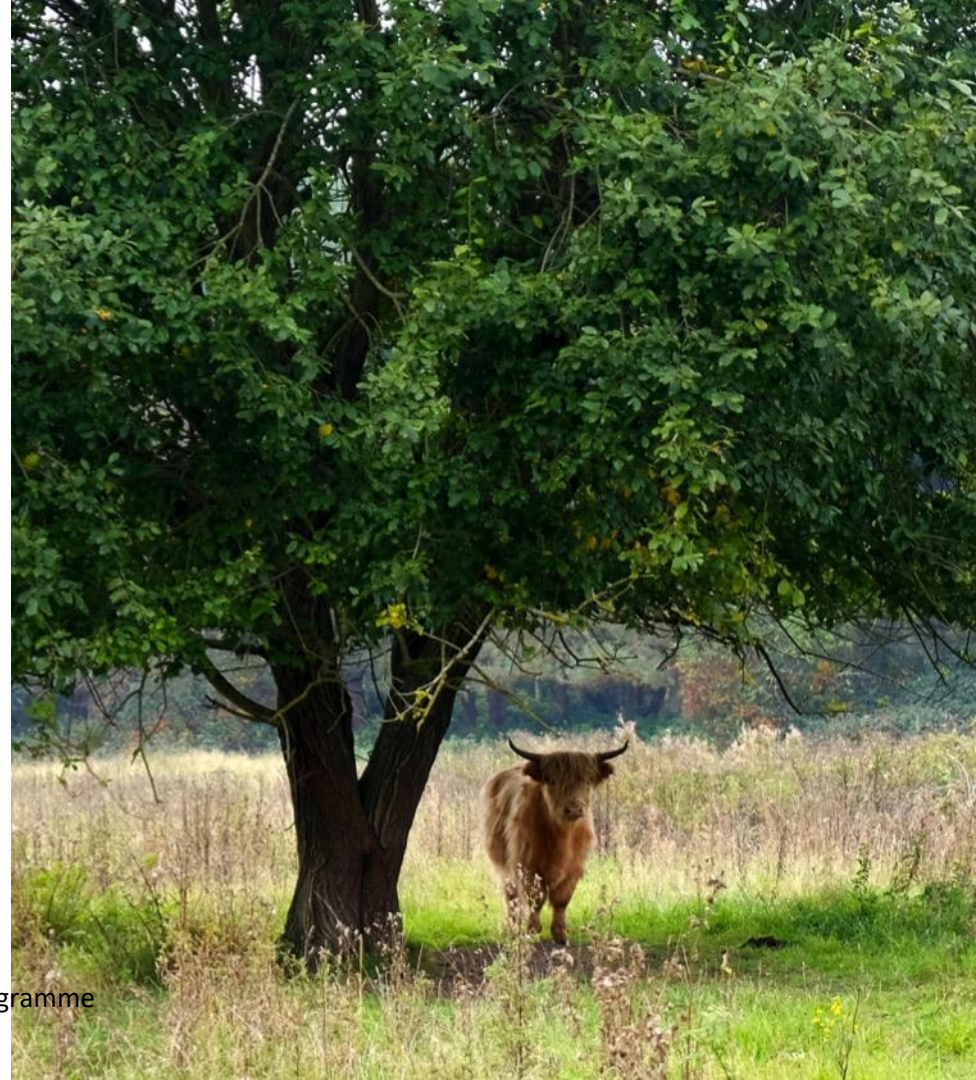
EAU NON
POTABLE

Diffuse pollution

Only c. 40% of surface water in EU reach good ecological status. Diffuse pollution dominated by agricultural sources is a major pressure.

By planting trees and restore woodland some of this could be reduced.

Payment for Ecosystem Services could be a way forward.



PESFOR-W User Guide

the PesFOR-W guidelines!

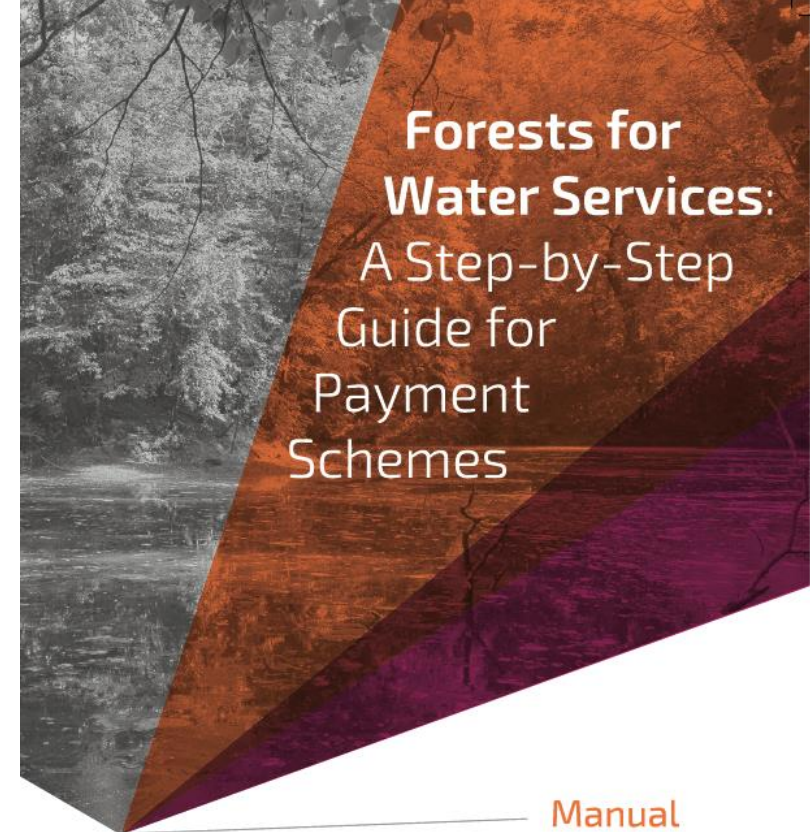
Main author: Tom Nisbet, Forest Research, UK

The guide is available in several languages:

English, German, Hungarian, Polish, Slovakian,
Spanish, and Ukrainian

Can be downloaded from Forest Research

Homepage www.forestresearch.gov.uk



Manual
2021



Photo: Johan Heurgren





Riparian forests

Riparian forests are a key feature in the forested landscape, since much of the run-off water quality is formed here and riparian forests are ecological hot spots connecting land and water ecosystems.



Forest operations

Forest operation cause a long range of unwanted side effects.

See
Shah et al. 2022 and Wei et al. 2022
for details

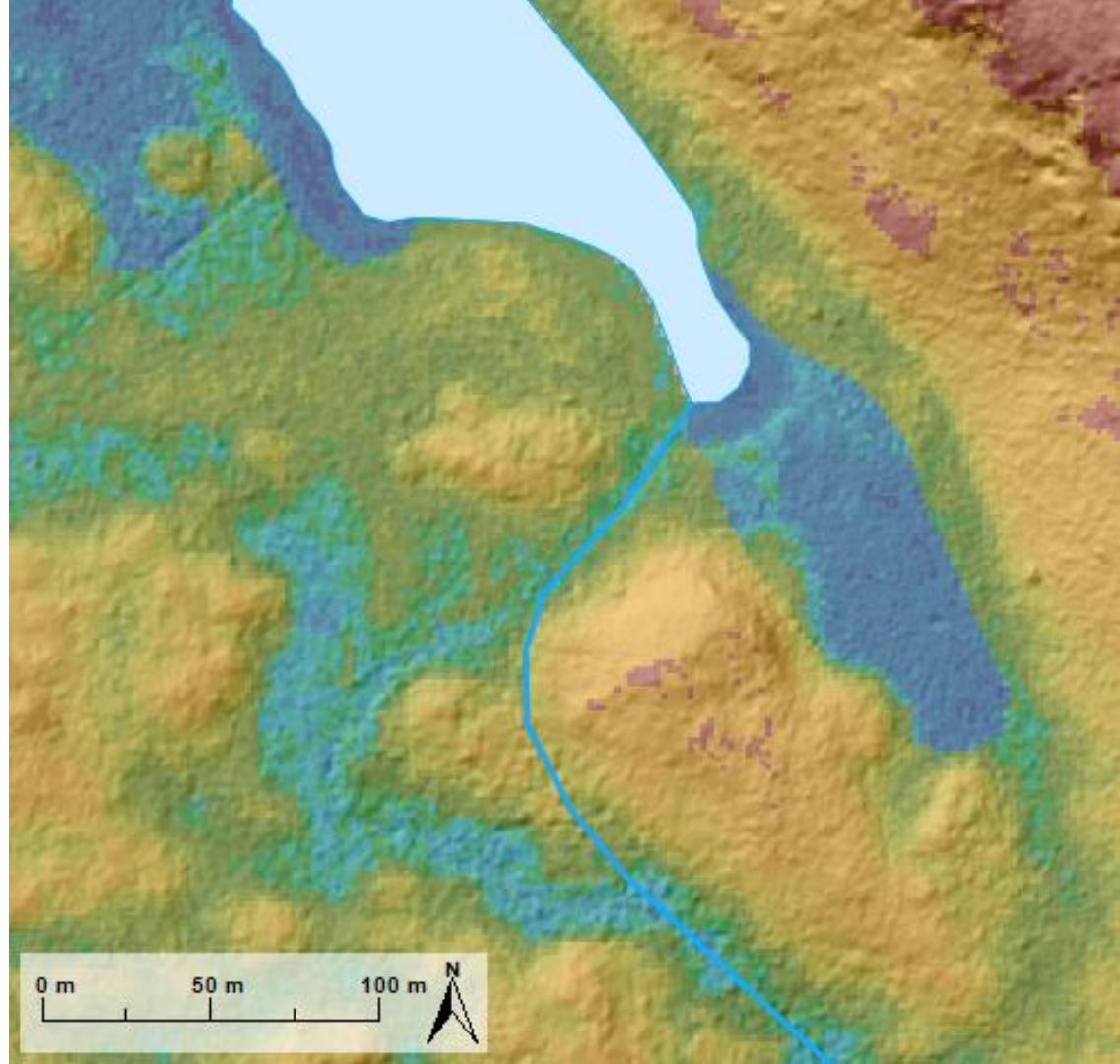


Depth to groundwater maps

Based on LIDAR scanning so called depth to groundwater (DTG) maps has been developed.

Freely available for the whole of Sweden.

Used daily in logging machines for planning





Knowledge transfer

Field-courses to forest owners, forest managers, and machine operators to highlight problems and show solutions that works.

Instruction films like:

Traceless <https://www.youtube.com/watch?v=xauLNORS4m0>

Policy briefs and Executive Summaries for policy- and decision makers



Next Step

How to integrate water issues with other pressing questions concerning forest: biodiversity, carbon storage, and ecosystem services including water.



Questions



What do we want?



Way forward?



Are we just going around in circles?



Thank you for your attention

List of papers

- Heurgren J, Högbom (2017) Traceless – instruction film. <https://www.youtube.com/watch?v=xauLNORS4m0>
- Högbom L, Abbas D, Armolaitis K, Baders E, Futter M, Jögiste K, Lazdins A, Lukmine D, Mustonen M, Øistad K, Poska A, Rautio P, Varnagiryte-Kabasinskiene I, Vodde F, Weslien J-O, Wilhelmsson L, Zute D (2021) Trilemma of Nordic-Baltic forestry – how to imply UN sustainable development goals. *Sustainability*, <https://doi.org/10.3390/su13105643>.
- Ilintsev A, Nakvasina E, Högbom L, Bogdanov A (2022) Influence of ruts on the physical properties of Gleyic Retisols after logging machinery passage. *Scandinavian Journal of Forest Research*, xx: xxx-xxx. <https://doi.org/10.1080/02827581.2022.2085785>
- Ilintsev A, Nakvasina EN, Högbom L (2021) Modern logging and methods of protection of forest soils in the process of logging operations. *Lesnoj Zhurnal (Russian Forestry Journal)*, 2021:5: 92-116. <https://doi.org/10.37482/0536-1036-5-92-116>.
- Labelle ER, Hansson L, Högbom L, Jourgholami M, Laschi A (2022) Strategies to Mitigate the Effects of Soil Physical Disturbances Caused by Forest Machinery: a Comprehensive Review. *Current Forestry Report* **8**, 20–37. <https://doi.org/10.1007/s40725-021-00155-6>
- Nisbet TR, Andreucci M-B, Rik De Vreese R, Högbom L., Kay S, Kelly-Quinn M, Leonardi A, Lyubenova MI, Ovando Pol P, Quinteiro P, Pérez Silos I, Valatin G (2022). Forest Green Infrastructure to Protect Water Quality: A Step-by-Step Guide for Payment Schemes. In: Nakamura, F. (eds) Green Infrastructure and Climate Change Adaptation. Ecological Research Monographs. Springer, Singapore. https://doi.org/10.1007/978-981-16-6791-6_8
- Ring E, Ågren A, Bergkvist I, Finér L, Johansson F, Högbom (2020) A guide to use wet area maps in forestry. Skogforsk Report 1051-2020 https://www.skogforsk.se/cd_20200618101746/contentassets/2b2c62c4a4934838a1460cbb7b327d20/arbetsrapport-1051-2020-2.pdf
- Ring E, Andersson M, Hansson L, Jansson G, Högbom L (2021) Logging mats and logging residues as ground protection during forwarder traffic along till hillslopes. *Croatian Journal of Forest Engineering* **42**, 445-462. <https://doi.org/10.5552/crojfe.2021.875>
- Ring E, Widenfalk O, Jansson G, Holmström H, Högbom L, Sonesson J (2018) Riparian forests along small streams on managed forest land in Sweden. *Scandinavian Journal of Forest Research* **33**, 133-146, DOI: [10.1080/02827581.2017.1338750](https://doi.org/10.1080/02827581.2017.1338750)
- Shah, NW, Baillie, B, Bishop K, Ferraz S, Högbom L, Nettles J (2022) The effects of forest management on water quality. *Forest Ecology and Management*, <https://doi.org/10.1016/j.foreco.2022.120397>.
- Sonesson J, Ring E, Högbom L, Lämås T, Widenfalk O, Mohtashami S, Holmström H (2021) Costs and benefits of seven alternatives for riparian forest buffer management, *Scandinavian Journal of Forest Research* **36**, 135-143, DOI: [10.1080/02827581.2020.1858955](https://doi.org/10.1080/02827581.2020.1858955)
- Valatin, G et al. (2017) PESFOR-W: Improving the design and environmental effectiveness of woodlands for water Payments for Ecosystem Services. *Research Ideas and Outcomes*, 3: e13828, <https://doi.org/10.3897/rio.3.e13828>.
- Wei X, Giles-Hansen K, Spencer SA, Ge X, Onuchin A, Li Q, Burenina T, Ilintsev A, Hou Y (2022) Forest harvesting and hydrology in boreal Forests: Under an increased and cumulative disturbance context, *Forest Ecology and Management*, <https://doi.org/10.1016/j.foreco.2022.120468>.