Versnippering en ontsnippering

30 mei 2024, Miquel (Mike) Lurling

Leerstoelgroep Aquatische Ecologie & Waterkwaliteitsbeheer

WAGENINGEN
UNIVERSITY & RESEARCH

Habitatfragmentatie, verlies en configuratie

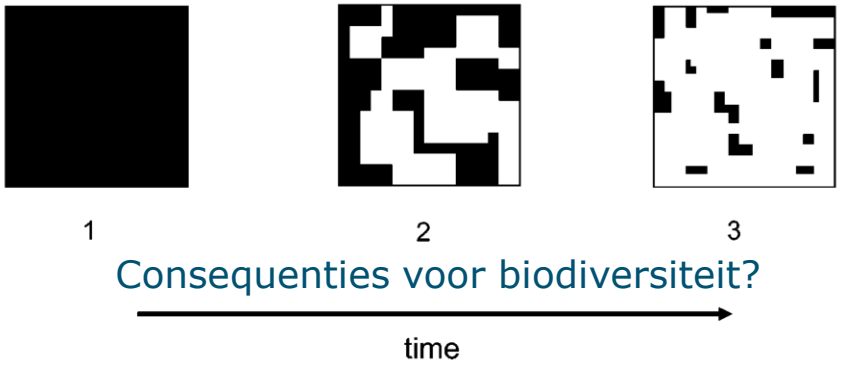


Figure 1 The process of habitat fragmentation, where "a large expanse of habitat is transformed into a number of smaller patches of smaller total area, isolated from each other by a matrix of habitats unlike the original" (Wilcove et al. 1986). Black areas represent habitat and white areas represent matrix.

Annu. Rev. Ecol. Evol. Syst. 2003. 34:487–515
doi: 10.1146/annurev.ecolsys.34.011802.132419

First published online as a Review in Advance on August 14, 2003

EFFECTS OF HABITAT FRAGMENTATION ON BIODIVERSITY

Lenore Fahrig
Ottawa-Carleton Institute of Biology, Carleton University, Ottawa, Ontario, Canada K1S 5B6; email: Lenore_Fahrig@carleton.ca

Verwacht bij fragmentatie:

1) Meer patches
2) Afname gemiddelde patch g
3) Toename patch isolatie

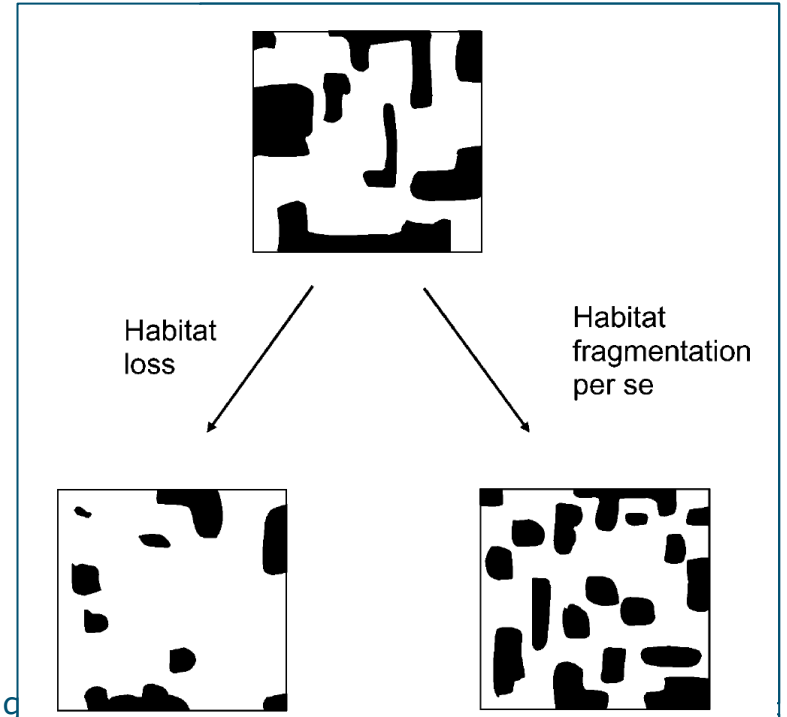


Figure 5 Both habitat loss and habitat fragmentation per se (independent of habitat loss) result in smaller patches. Therefore, patch size itself is ambiguous as a measure of either habitat amount or habitat fragmentation per se. Note also that habitat fragmentation per se leads to reduced patch isolation.

WAGENINGEN
UNIVERSITY & RESEARCH

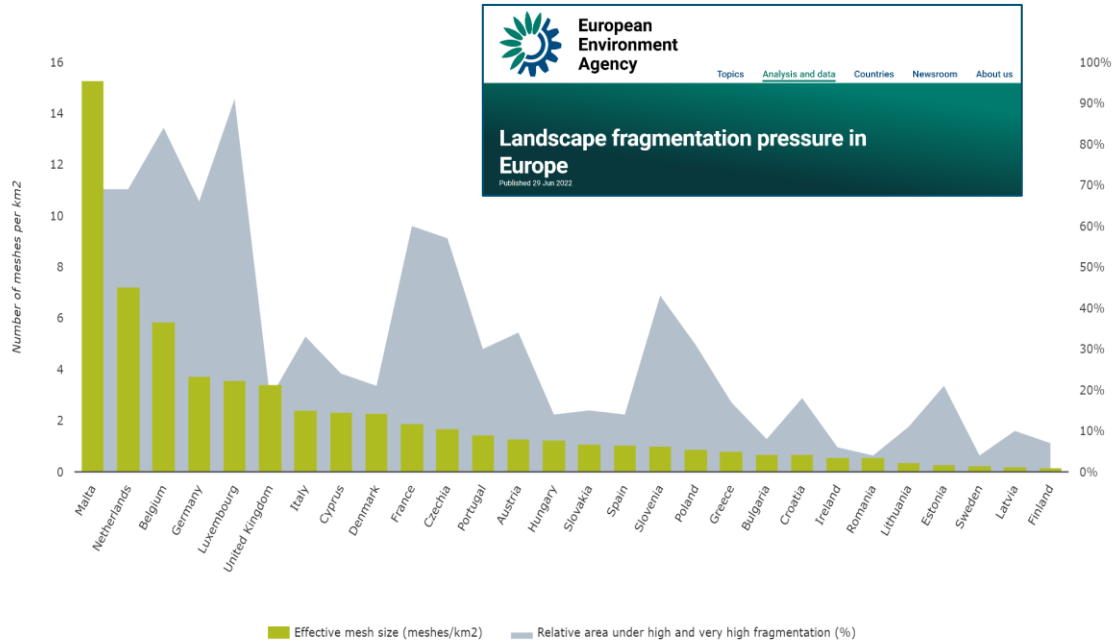
Habitat en schaal

Fragmentatie op l

10:35 – 10:55	Effecten van habitat maatregelen in de kunstmatige habitat van Flevoland *Martijn Hokken (Waterschap Zuiderzeeland)*
10:55 – 11:10	***Pauze***
11:10 -11:30	Markermeer; Voedselweb in isolatie

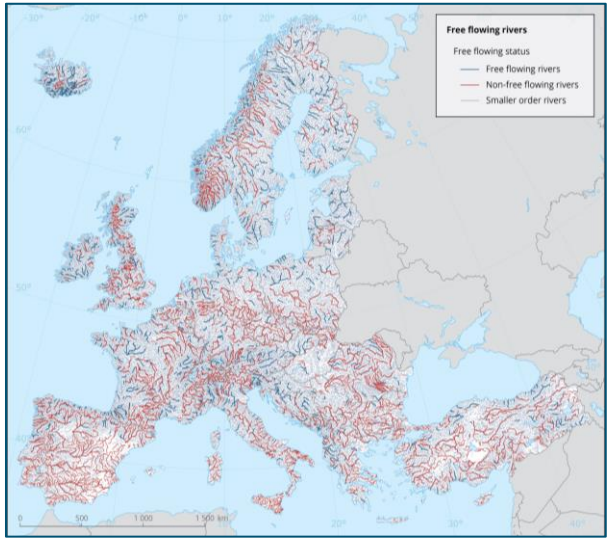
Versnippering is behoorlijk hoog in Nederland

Figure 2. Landscape fragmentation in European countries, 2018, EU-27 and the UK



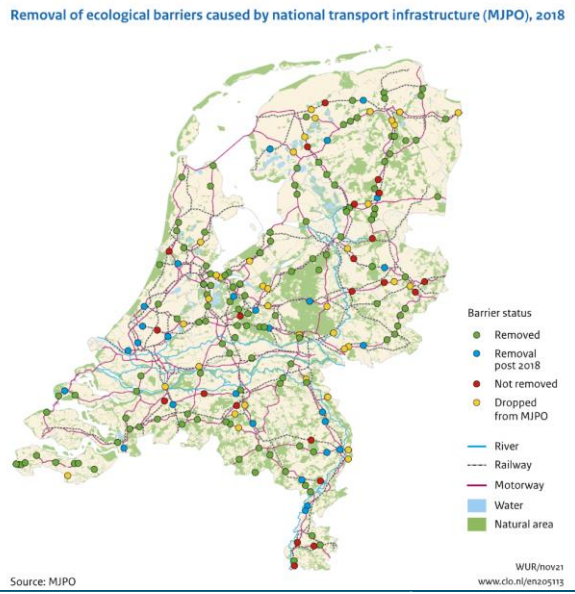
Free flowing rivers in Europe

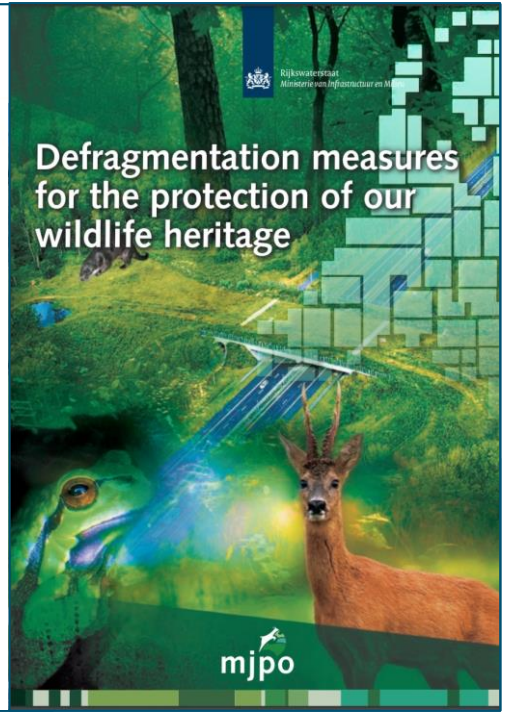
This figure shows connectivity of rivers in EEA-39 as defined in "Mapping the world's free-flowing rivers" (https://www.nature.com/articles/s41586-019-1111-9). Dams and reservoirs and their up- and downstream propagation of fragmentation and flow regulation are the leading contributors to the loss of river connectivity.



Meerjarenprogramma Ontsnippering

A unique wildlife crossing has been constructed over the N359 aquaduct at Galamadammen, near Stavoren. A nice wide, wet, green strip over the road connects the Frisian lakes on both sides of the road





Internationale ver- en ontsnippering

HABITAT LOSS HALVED OR REDUCED

Niet gehaald

By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Summary of target achievement

The recent rate of deforestation is lower than that of the previous decade, but only by about one third, and deforestation may be accelerating again in some areas. Loss, degradation and fragmentation of habitats remains high in forest and other biomes, especially in the most biodiversity-rich ecosystems in tropical regions. Wilderness areas and global wetlands continue to decline. Fragmentation of rivers remains a critical threat to freshwater biodiversity. **The target has not been achieved** (*high confidence*).[1]

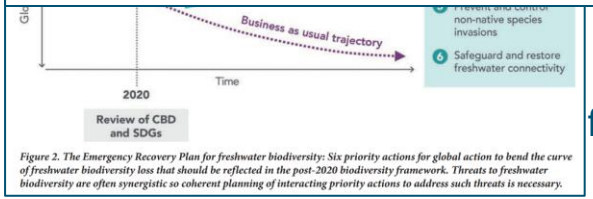
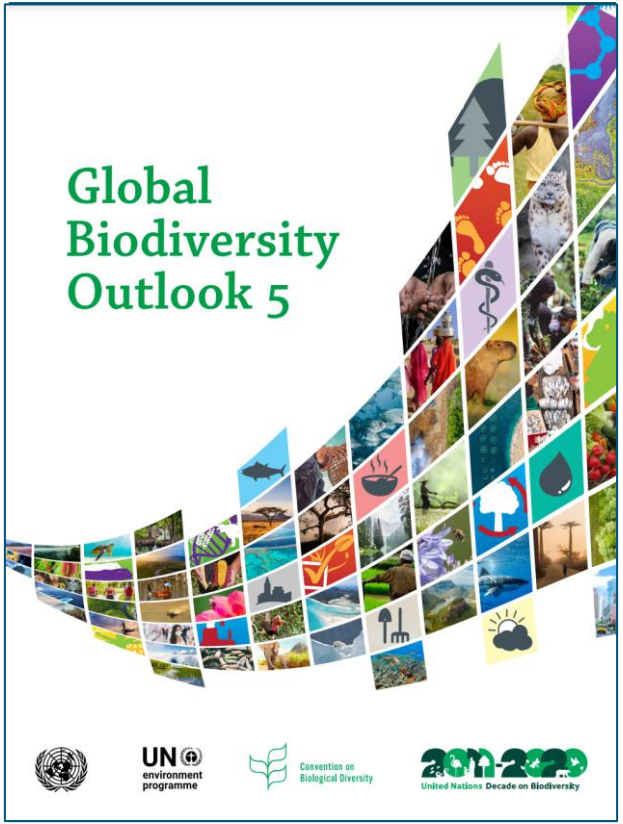


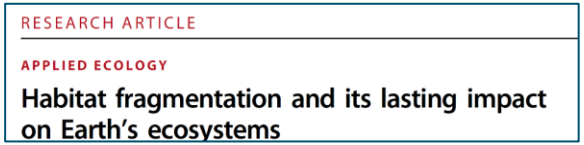
Figure 2. The Emergency Recovery Plan for freshwater biodiversity: Six priority actions for global action to bend the curve of freshwater biodiversity loss that should be reflected in the post-2020 biodiversity framework. Threats to freshwater biodiversity are often synergistic so coherent planning of interacting priority actions to address such threats is necessary.

Biological Diversity (CBD)

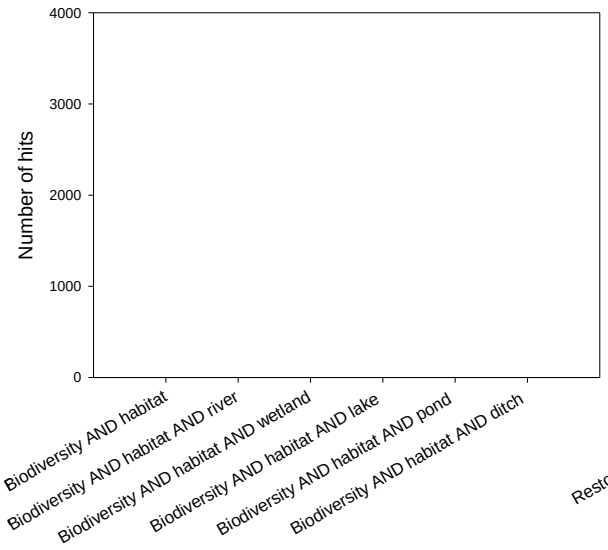
for Biodiversity 2011-2020



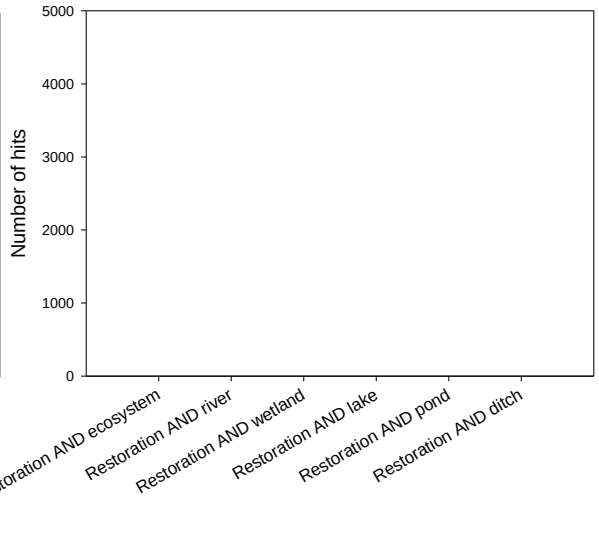
Onderzoek aan habitatherstel in meren en sloten



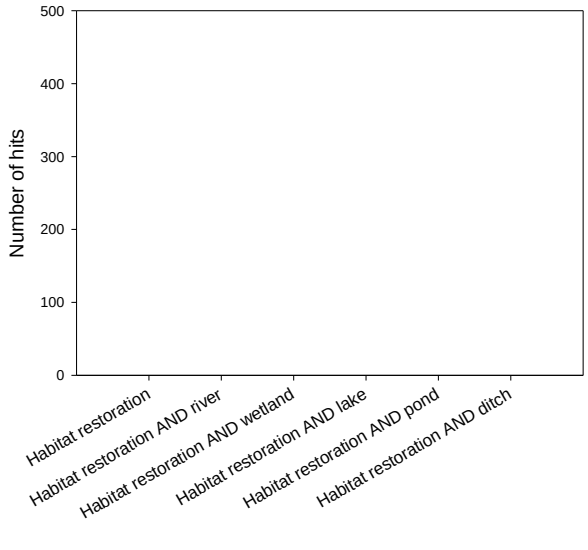
Biodiversiteit & habitat & …



Restoratie & …



Habitat restoratie & …



Onderzoek aan habitatherstel in meren en sloten

Hydrobiologia (2022) 849:3737–3760
https://doi.org/10.1007/s10750-021-04771-y

ECOLOGY OF SHALLOW LAKES

Review Paper

Habitat complexity in shallow lakes and ponds: importance, threats, and potential for restoration

Mariana Meerhoff · María de los Ángeles González-Sagrario

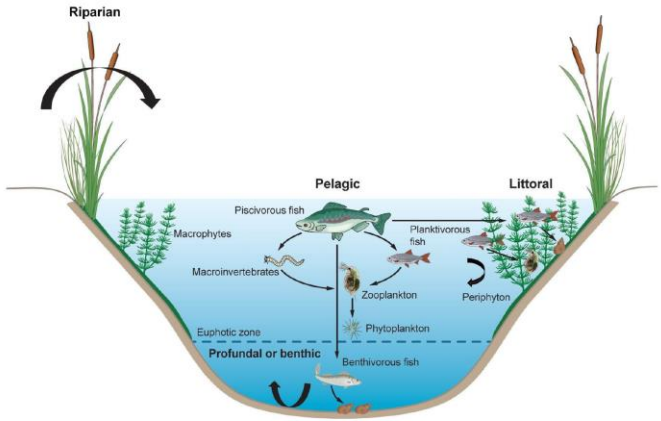


Fig. 1 Habitat complexity in shallow lakes and ponds. Three major within-lake habitats are recognized: the pelagic, the benthic, and the littoral zone, all interacting with the adjacent terrestrial ecosystem through the riparian zone. Each lake habitat is characterised by different assemblages of organisms and different levels of complexity. Drawn by M.Meerhoff and Tinna Christensen. From Kosten & Meerhoff, 2014

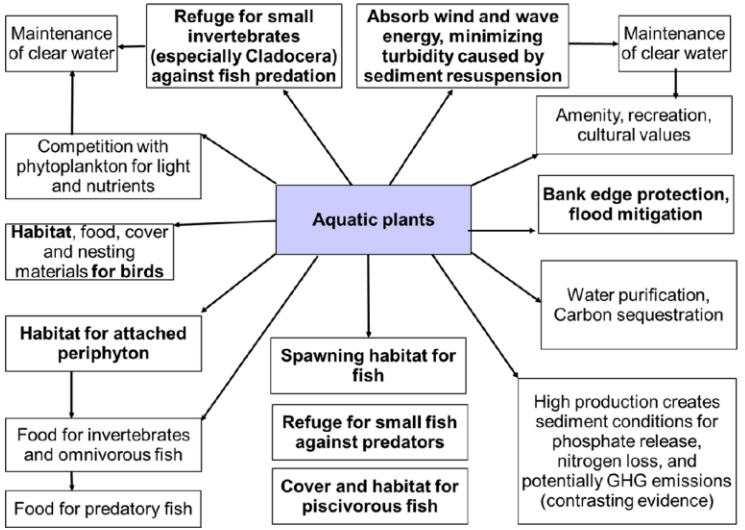


Fig. 3 Effects of aquatic plants on physical, chemical and biological processes in shallow lakes and ponds, and ecosystem services. The processes that are directly related to the habitat complexity created by the plants are highlighted. All processes are relevant for submerged plants, and many are shared with some other plant life-forms, please see the text for elaboration. Based on Moss et al. (1996)

Onderzoek aan habitatherstel in meren en sloten

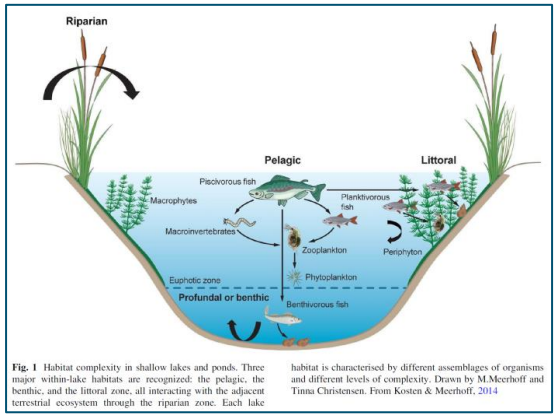


Fig. 1 Habitat complexity in shallow lakes and ponds. Three major within-lake habitats are recognized: the pelagic, the benthic, and the littoral zone, all interacting with the adjacent terrestrial ecosystem through the riparian zone. Each lake habitat is characterised by different assemblages of organisms and different levels of complexity. Drawn by M.Meerhoff and Tinna Christensen. From Kosten & Meerhoff, 2014

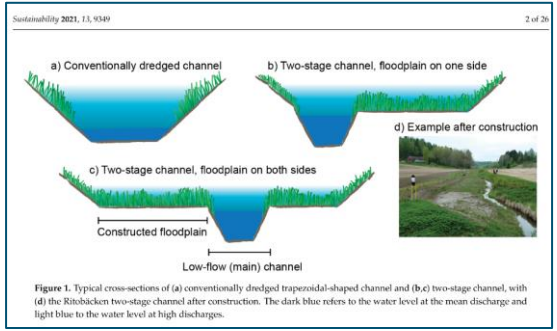


Figure 1. Typical cross-sections of (a) conventionally dredged trapezoidal-shaped channel and (b,c) two-stage channel, with (d) the Ritobäcken two-stage channel after construction. The dark blue refers to the water level at the mean discharge and light blue to the water level at high discharges.

Bufferstroken, reductie belasting nutriënten en pesticides

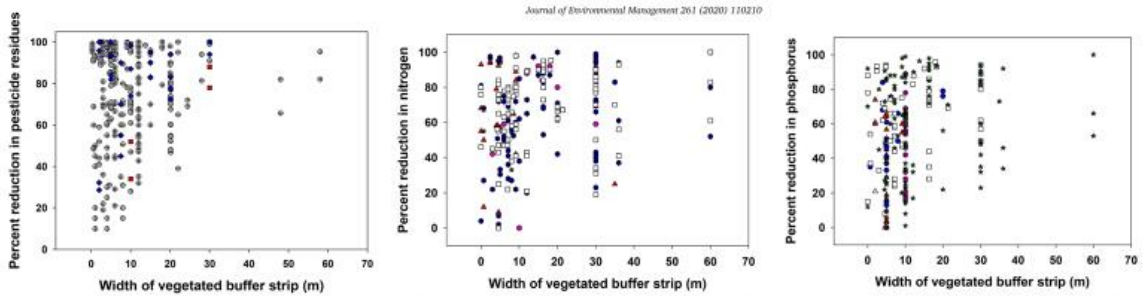


Fig. 5. The percent reduction of pesticide residue movement from an agriculture field to surface water relative to the width of the vegetated buffer strip (m) reported in 44 studies (n = 378). White circles with crosses, red squares, and blue diamonds represent herbicides, fungicides, and insecticides, respectively.

Fig. 6. The percent reduction of nitrogen movement from an agriculture field to surface water relative to the width of the vegetated buffer strip (m) reported in 38 studies (n = 225). Blue hexagons with crosses, white squares, pink circles, red triangles, and green stars represent nitrate, total nitrogen, ammonia, ammonium and organic nitrogen, respectively.

Fig. 7. The percent reduction of phosphorus movement from an agriculture field to surface water relative to the width of the vegetated buffer strip (m) reported in 38 studies (n = 243). Blue circles, white squares, pink hexagons with crosses, red triangles, green stars, and white triangles represent particulate-bound phosphorus, phosphate, orthophosphate, dissolved phosphorus, total phosphorus, and reactive/unreactive phosphorus, respectively.

Journal of Environmental Management 261 (2020) 110210
Contents lists available at ScienceDirect
Journal of Environmental Management
journal homepage: http://www.elsevier.com/locate/jenvman
ELSEVIER

Review

A review of the effectiveness of vegetated buffers to mitigate pesticide and nutrient transport into surface waters from agricultural areas

R.S. Prosser[a,*], P.F. Hoekstra[b], S. Gene[a], C. Truman[c], M. White[c], M.L. Hanson[d]

Based on cited literature, there appears to be consensus that plant community density plays a critical role in buffer effectiveness to attenuate pesticide and nutrient transport to surface water. Also, a VBS composed of a mix of grasses, shrubs, and fast-growing trees can increase pesticide and nutrient mitigation. Plant community composition and buffer structure and maintenance (e.g., absence of erosion rills) should be incorporated into recommendations made by jurisdictions on best management practices for VBS and factored into regulatory exposure assessment to aquatic ecosystems. Incorporation of these two factors will likely decrease the variability in the level of mitigation achieved by buffers of similar width (Figs. 5–7), and therefore ensure a more consistent mitigation of pesticide and nutrient risk to aquatic ecosystems.

Nieuwe stippen verrijzen aan de horizon

- 15th Conference of Parties to the UN Convention on Biological Diversity adopted the "**Kunming-Montreal Global Biodiversity Framework" (GBF)**, including four goals and 23 targets for achievement by 2030.

- Effective conservation and management of at least 30% of the world's lands, inland waters, coastal areas and oceans, with emphasis on areas of particular importance for biodiversity and ecosystem functioning and services. The GBF prioritizes ecologically-representative, well-connected and equitably-governed systems of protected areas and other effective area-based conservation, recognizing indigenous and traditional territories and practices. Currently 17% and 10% of the world's terrestrial and marine areas respectively are under protection.
- Have restoration completed or underway on at least 30% of degraded terrestrial, inland waters, and coastal and marine ecosystems

Nieuwe stippen verrijzen aan de horizon

‘Our lakes, our future’: Holistic approaches to transform lake management and restoration in a changing world

Linking the challenge to vision through solution-based research.

THE CHALLENGE

- Deteriorating lake health and increasing stressors
- Monitoring approaches woefully outdated
- Methods to identify and prioritise stressors lacking
- Self-sustaining lake restoration unsuccessful

THE SOLUTION

Holistic lake health
- Incorporates cultural & ecological values
- Includes cutting edge technology
- Utilises unique data/sample set

Susceptibility & diagnostic assessment
- Effectively identifies key stressors
- Predicts impacts of climate change
- Inform prioritisation of mitigation actions

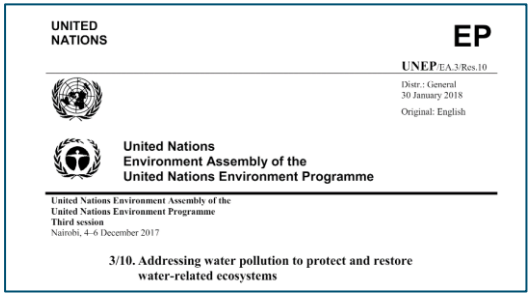
Lake restoration framework
- Informed by mātauranga-a-iwi/hapū
- Enhances whole lake ecosystem restoration
- Structured decision making process

OUR VISION

Our lakes are flourishing due to the implementation of holistic approaches for characterising, diagnosing, and improving lake health.

Nieuwe stippen verrijzen aan de horizon

WWQA
World Water Quality Alliance



UNITED NATIONS

EP

UNEP/EA.3/Res.10

Distr.: General
30 January 2018

Original: English

United Nations
Environment Assembly of the
United Nations Environment Programme

United Nations Environment Assembly of the
United Nations Environment Programme
Third session
Nairobi, 4–6 December 2017

3/10. Addressing water pollution to protect and restore water-related ecosystems

European Commission

JOINT RESEARCH CENTRE

EU Science Hub

Science for policy

The main website of the European Commission's Joint Research Centre. The JRC provides independent, evidence-based science and knowledge, supporting EU policies to positively impact society.

The UN Environment Programme (UNEP) and the Joint Research Centre (JRC) of the European Commission launched the World Water Quality Alliance (WWQA) in Ispra, Italy

19 SEP 2019 | PRESS RELEASE | FRESH WATER

World Water Quality Alliance launched to tackle global water crisis

WAGENINGEN
UNIVERSITY & RESEARCH

Photograph of people viewing Loch Leven, Scotland, UK. Image credit: Bryan Spears.

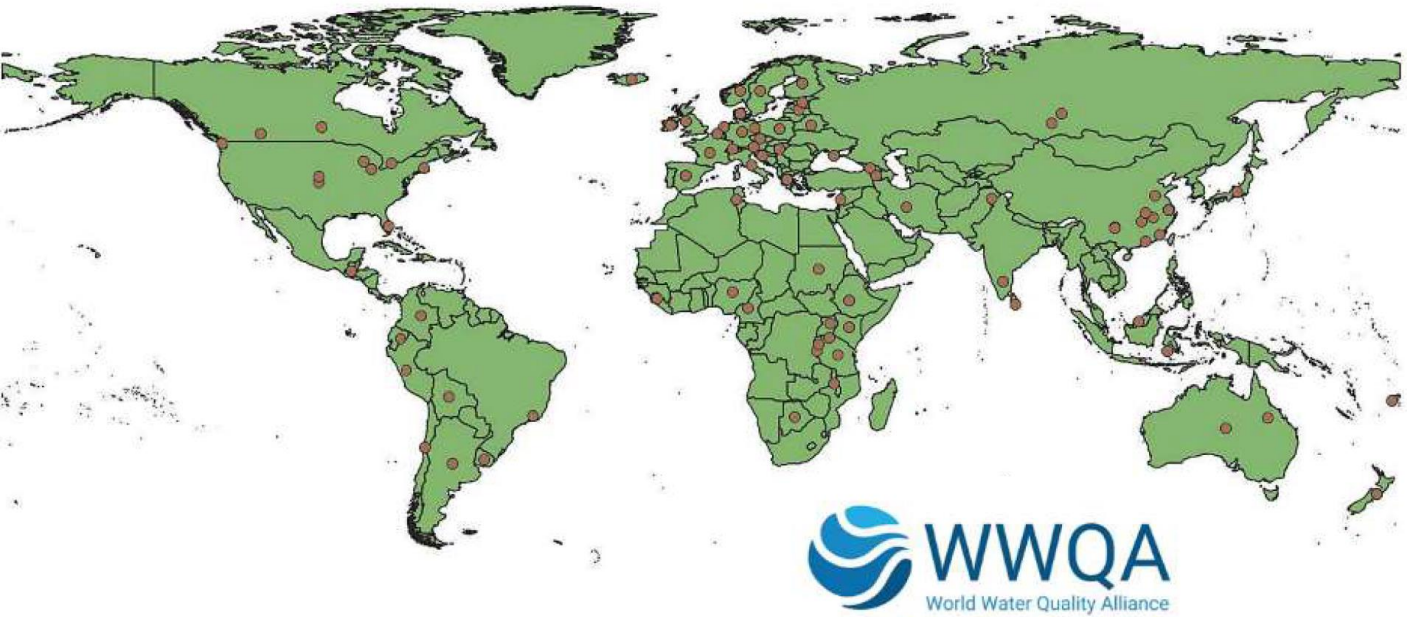
WWQA Ecosystems – Objectives

The WWQA Ecosystem Workstream was established in 2021 to support large-scale restoration initiatives to prevent, halt and redress the destruction of our freshwater ecosystems, focusing initially on water quality management in lakes and their catchments. Key objectives include:

- Build the WWQA Ecosystems Membership and review and synthesise their experiences on the challenges and benefits of lake restoration
- Enhance coordination of action in the area of lake restoration and mobilization of policymakers
- Raise awareness across sectors of the multiple benefits of effective sustainability-based restoration of freshwater ecosystems

Lakes are undervalued, understudied and often overlooked. Yet, they are of crucial importance for food security, the provision of clean water for drinking and irrigation, energy production, navigation, recreation and biodiversity.

Global Survey of Lake Restoration Practitioners

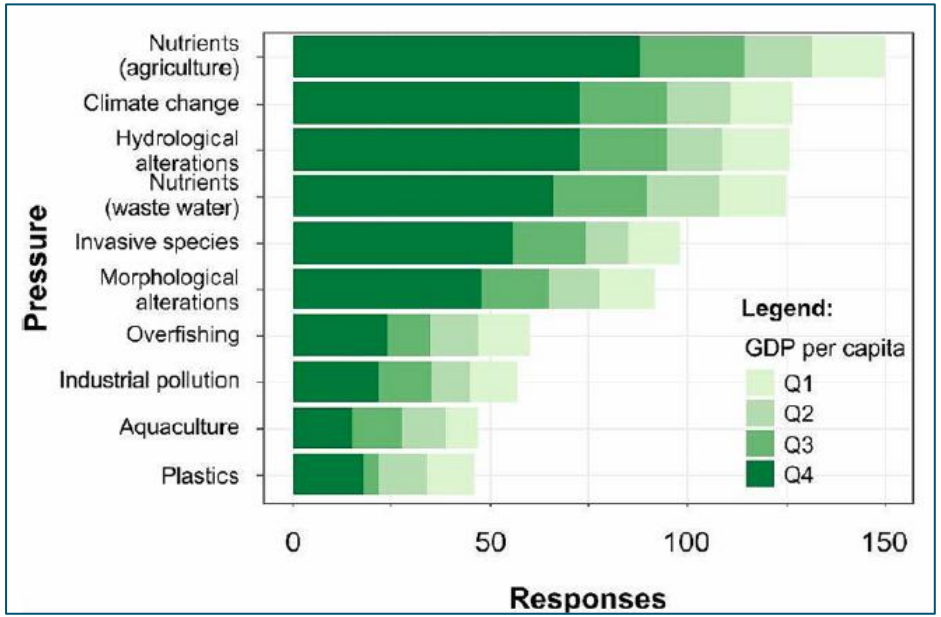


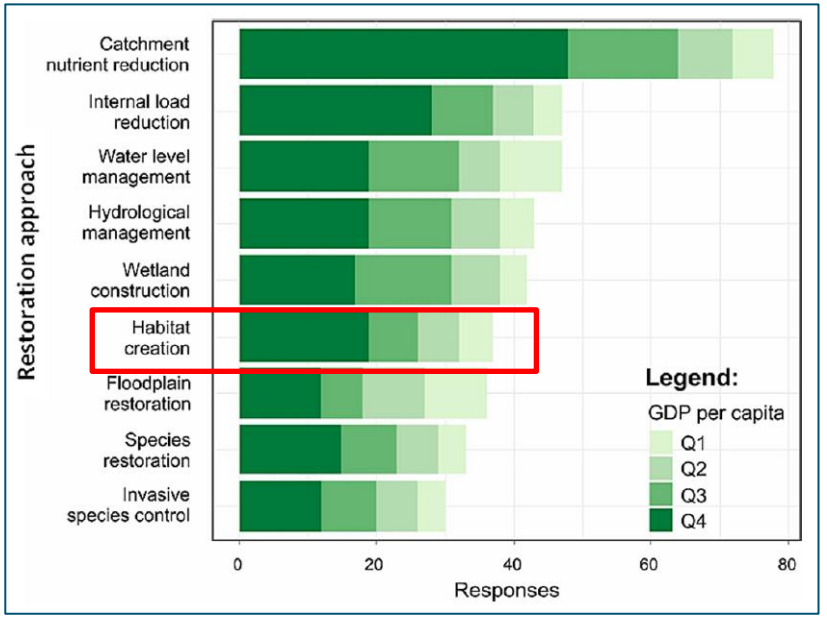
Join the Global Community of Practice on Lakes

SCAN ME

https://www.decadeonrestoration.org/publications/global-assessment-lake-restoration-practice

UN SDG 6.3.2 reports that efforts to monitor and assess lake water quality are extremely limited globally, especially in low GDP countries (UNEP, 2021a).





Survey publicatie:
179 antwoorden
65 landen
7 uit Nederland

Habitatcreatie als herstelmaatregel

Ecological Indicators 158 (2024) 111330

Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind

Original Articles

A global assessment of lake restoration in practice: New insights and future perspectives

Sandra Poikane [a,*], Martyn G. Kelly [b,c], Gary Free [a], Laurence Carvalho [d], David P. Hamilton [e], Konstantina Katsanou [f], Miquel Lürling [g], Stuart Warner [h], Bryan M. Spears [i], Kenneth Irvine [f]

Wageningen University

Water Authority Brabantse Delta

Wetterskip Fryslân

Hoogheemraadschap van Schieland en de Krimpenerwaard

Waterschap Brabantse Delta (regional water authority)

Wageningen University

Waterschap Brabantse Delta

UN environment assembly

SUSTAINABLE DEVELOPMENT GOALS

THE BIODIVERSITY PLAN
For Life on Earth

UNITED NATIONS DECADE ON ECOSYSTEM RESTORATION 2021-2030

UN environment programme

Food and Agriculture Organization of the United Nations

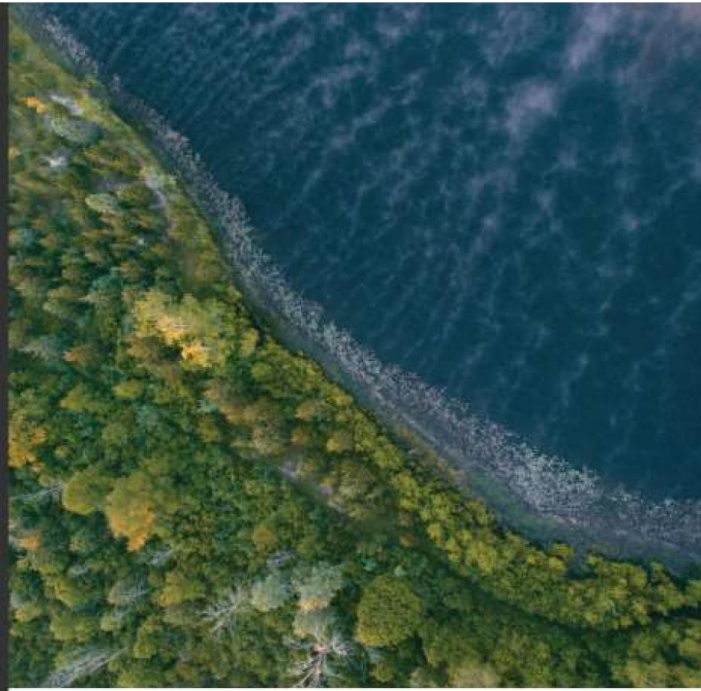
Convention on Biological Diversity

UNDRR United Nations Office for Disaster Risk Reduction

United Nations Climate Change

UN 2023 Water Conference
22 – 24 Mar 2023, New York

WWQA
World Water Quality Alliance



UNEP – WWQA Ecosystems – https://wwqa.info

Embedding lakes into the global sustainability agenda

Protecting and restoring ecosystems to deliver global scale socio-economic benefits

White Paper prepared by the United Nations Environment Programme coordinated Word Water Quality Alliance – Ecosystems Workstream

https://zenodo.org/records/10477644

Embedding Lakes into the Global Sustainability Agenda

WWQA
World Water Quality Alliance

4 actions to accelerate sustainable lake management

1 Build capacity in monitoring and assessment
- Improve global coverage of long-term lake monitoring networks
- Accelerate integrated open-data sharing
- Support national monitoring and assessment programmes

2 Embed lake management in national policies
- Develop National Lake Recovery Plans
- Establish an International Centre for Innovation and Knowledge Exchange for sustainable lake management

3 Foster green finance partnerships
- Establish a Global Green Finance Fund for Lakes
- Increase funding for capacity development in disaster response

Ontsnippering belanghebbenden

4 Raise global awareness on the benefits of change
- Implement a global communication campaign
- Establish a Global Coalition for Lakes.

The driver of change…

IHE DELFT Institute for Water Education · UK Centre for Ecology & Hydrology · European Commission · WAGENINGEN UNIVERSITY & RESEARCH · THE WORLD BANK · UN environment programme · GEMS Water · NIVA · BOWBURN CONSULTANCY Specialist Ecological Advice to the Water Industry

Bedankt!

Ontsnippering op verschillende schalen is onderdeel van herstelpakket

Werk aan ontsnippering lijkt behoorlijk gefragmenteerd

Belanghebbenden kunnen zich verenigen in een coalitie van de welwillenden

uPcycle/WWQA Global Community of Practice