Hydromorphology of rivers and floodplains – What is at stake and how does REFORM contribute?

Tom Buijse
Deltanes
Utrecht, the Netherlands
E: tom.buijse@deltares.nl
Hydromorphological pressures in European surface waters

- 127 000 surface water bodies
  - 82% rivers
  - 15% lakes
  - 3% coastal and transitional waters

- HYMO pressures affecting ..
  - 40% river and transitional waters
  - 30% lakes

- Causes
  - Hydropower
  - Navigation
  - Agriculture
  - Flood protection
  - Urban development

Source: EEA report 8/2012 European waters – assessment of status and pressures
### How do we share expertise on river restoration?

Examples of EU funded River River restoration projects

#### Count of Project Name

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<th>Global objective</th>
<th>Programme</th>
<th>LIFE</th>
<th>Grand Total</th>
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<td>Grand Total</td>
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#### How do we share expertise on river restoration?

- [http://www.life-wachau.at/](http://www.life-wachau.at/)
- [http://wwwwammde/lifelippaeu.html](http://wwwwammde/lifelippaeu.html)
- [http://www.wwf.se/flodparlussla](http://www.wwf.se/flodparlussla)
REstoring rivers FOR effective catchment Management

November 2011 – October 2015

Tom Buijse NL
Roy Brouwer NL
Ian Cowx UK
Harm Duel NL
Nikolai Friberg DK/N
Angela Gurnell UK
Daniel Hering GE
Eleftheria Kampa GE
Erik Mosselman NL
Susanne Muhar AU
Matthew O’Hare UK
Tomasz Okruszko PL
Massimo Rinaldi IT
Jan Vermaat NL
Christian Wolter GE

4th All Partner Meeting – June 2014
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<td>Norsk Institutt for Vannforsknning</td>
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26 partners from 15 European countries
Objectives of REFORM

APPLICATION
1. Select indicators for cost-effective monitoring
2. Improve tools and guidelines for restoration

RESEARCH
1. Review existing information on river degradation and restoration
2. Develop a process-based hydromorphological framework
3. Understand how multiple stress constrains restoration
4. Assess the importance of scaling on the effectiveness of restoration
5. Develop instruments for risk and benefit analysis to support successful restoration

DISSEMINATION
1. Enlarge appreciation for the benefits of restoration
WEBSITE: www.reformrivers.eu

18 deliverables
23 scientific publications
Lecture Notes
1. Ian Cowx (UK) Planning stream and river restoration and cost-benefit analysis
2. Angela Gurnell (UK) The REFORM hydromorphology framework: working with river processes
3. Massimo Rinaldi (Italy) Hydromorphological assessment
4. Christian Wolter (Germany) Biological assessment
5. Nikolai Friberg (Norway) Coupling hydromorphology to biotic responses: challenges in assessing river restoration outcomes
6. Jochem Kail (Germany) Selection of restoration measures: general principles and approaches, potential restoration measures and effects on river morphology and biota
7. Gertjan Geerling (The Netherlands) Recap of the key reform steps for effective river restoration
Guidance and tools – REFORM WIKI

How does my river work?
River characterisation

What’s wrong?
River condition
Driver – Pressure – State - Impact

How can we improve?
Identifying potential measures
Response

Programme of measures
Implementation
Project cycle
Plan – Do – Check – Act
Cooperation with ...

make use of earlier research projects (e.g. REBECCA, WISER, FORECASTER)
RESTORE (LIFE+ Information & Communication)

European Centre for River Restoration (ECRR)
WFD Implementation: common implementation strategy (CIS)

Advisory Board of REFORM

Connecting to new research projects (e.g. MARS)

Lourdes Alvarellos, Gary Brierley, Johan Kling, Margaret Palmer, Hervé Piégay, Peter Pollard, Ursula Schmedtje, Bas van der Wal
European stakeholder workshop – Brussels February 2013

National stakeholder workshops
• Zutphen, the Netherlands November 2013
• York, UK May 2014
• Seville, Spain June 2014
• Rome, Italy September 2015

Thematic workshops
• Role of groundwater for river ecosystems – Biebrza, Poland September 2014
• Linking E-flows to sediment dynamics – Rome, Italy September 2015
• ECOSTAT Hydromorphology – Oslo, Norway October 2015

Summer school – Wageningen, Netherlands June 2015
Scientific conference – Wageningen, Netherlands June 2015
REFORM Stakeholder Workshop (Brussels, February 2013)

BREAKOUT SESSIONS
• Lowland rivers
• Highland/midland rivers
• Mediterranean rivers
• Unraveling the impact of hydromorphological pressures in multiple-pressure settings
• Designing programmes of measures
• Heavily modified water bodies

IMPORTANT TOPICS
• Cause-effect between HyMo and biota
• Ecological indicators of HyMo impacts
• SEDIMENT ASSESSMENT METHODS & SEDIMENT CONTINUITY ISSUES
• Disentangling effects of HyMo pressures
• Use HyMo to define GEP of heavily modified water bodies
• GUIDANCE ON ENVIRONMENTAL FLOWS
• Robust ways to confidently demonstrate success of RR
• Cost-effective methods for RR monitoring
• Process-led RR & account for cumulative impacts within a catchment scale approach
• Decision support tools to emphasise benefits of RR
• General framework for ecosystem services

Confronting prioritised requests from participants with foreseen output of REFORM

D7.3 Proceedings of the End-user workshop
Thank you for your attention

Our project website is our display window

www.reformrivers.eu

Acknowledgements
REFORM receives funding from the European Union’s Seventh Programme for research, technological development and demonstration under Grant Agreement No. 282656

COLLABORATIVE PROJECT
LARGE SCALE INTEGRATING PROJECT

ENV.2011.2.1.2-1
HYDROMORPHOLOGY AND ECOLOGICAL OBJECTIVES OF WFD

GRANT NO. 282656