THEME: Environment (including climate change)
TOPIC: ENV.2011.2.1.2-1 Hydromorphology and ecological objectives of WFD
Collaborative project (large-scale integrating project)
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REstoring rivers FOR effective catchment Management

Deliverable D7.3 Proceedings of the end-user workshop

Title Summary report REFORM stakeholder workshop

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Dissemination Level

PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Summary

The technical and interactive Stakeholder Workshop on River Restoration to Support Effective Catchment Management was held on 26-27 February 2013 in Brussels. Its main aim was to provide a platform for consultation and exchange between REFORM scientists, European technical experts working on river degradation and restoration, and members of the WG A Ecological Status (ECOSTAT) of the Common Implementation Strategy (CIS) for the WFD (2000/60/EC).

Approximately 110 participants attended the workshop and thirteen speakers presented wide-ranging points of view on the topics of river degradation and restoration. Twenty-three European countries, including national administrations and other stakeholder groups, were represented.

At the workshop, the first results of REFORM were presented and the invited experts had the opportunity to give their feedback, especially on how the management tools and approaches created by the project can contribute to the next round of river basin management plans (RBMPs).

Detailed discussions within breakout sessions were structured on the following themes:

- 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

For each of these themes, several priority recommendations/requests to the project were formulated by the stakeholders. A selection of key recommendations/requests to the project referred to the following aspects:

- Better understanding of cause-effect relationships between hydromorphological and biological indicators
- Recommendations for ecological indicators of hydromorphological impacts
- Need for process-led river restoration within a catchment scale approach and need to account for cumulative impacts
- Sediment assessment methods & improvement of knowledge on sediment continuity issues
- Use of existing data (DTM, satellite, monitoring) to characterise river networks at catchment/regional scale and prioritisation of field campaigns to collect integrated fluvial geomorphological information
- Disentangling the effects of hydromorphological pressures including empirical and modelled data
- Use of hydromorphology to define good ecological potential of heavily modified water bodies
- Cost-effective methods for river restoration monitoring, in terms of spatial and temporal scales and key indicators
- Development of guidance on the definition of environmental flows
- Quantification of ecological and hydromorphological benefits to provide more practical tools; Decision support tools to emphasise benefits of river restoration to stakeholders
- General framework accounting for ecosystem services

- Robust ways to confidently demonstrate success of restoration measures

The research within REFORM is primarily based on compiling and analysing existing data and there is only limited collection of new data and experimental research. Thus, the outcomes of REFORM strongly depend on project data collected to study the impacts of degradation or benefits of restoration. In this workshop summary report, specific considerations are reported (see Section 6) on what REFORM can do explicitly about the issues raised by stakeholders, giving an indication of the relevant deliverables and the expected time of their publication on the REFORM website (http://www.reformrivers.eu).

All in all, the REFORM stakeholder workshop provided a very good model of early two-way communication between an EU research project and water managers, especially those involved in the CIS ECOSTAT community. The workshop has also been a good opportunity for the REFORM scientists to understand the needs of stakeholders.

In the following months, the original work programme of REFORM may be adapted in certain aspects, on the basis of the 1st project periodic review and requests made to the project by stakeholders at the REFORM Stakeholder Workshop. In the same time, substantial effort will be made to make project information available in the REFORM WIKI (http://wiki.reformrivers.eu) in a way suitable for water managers to use.

Finally, the REFORM project will continue to inform and consult with the stakeholder community using an array of communication tools:

- Active interaction with relevant working groups of the CIS of the WFD and involvement in expert groups set up by the European Commission to support WFD implementation
- Bi-annual publication of the REFORM Newsletter (subscription under http://reformrivers.eu/home)
- Circulation of Policy Briefs
- Organisation of a Final Conference in 2015, with invitation to the stakeholder community.

Acknowledgements

The work leading to this report has received funding for the EU's 7th FP under Grant Agreement No. 282656 (REFORM).

Table of Contents

1. Introduction

1.1 REFORM background

REFORM is a four-year (2012-2015) EU-funded FP7 research project which will provide tools and procedures to increase the success and cost-effectiveness of river restoration measures and to monitor the biological responses to hydromorphological changes with greater precision and sensitivity. The main aim of the project is to make the state-of-the-art knowledge on hydromorphology, the interaction with ecology and ecosystem services of stream, river and floodplain ecosystems and wider environmental aspects, timely available to support river basin managers while preparing the next round of River Basin Management Plans (RBMPs).

The restoration framework in REFORM addresses the relevance of dynamic processes at various spatial and temporal scales, the need for setting end-points, the analysis of risks and benefits, and the integration with other societal demands (e.g. flood protection and water supply). This multidisciplinary work is being organized in eight work packages (WPs) belonging to three modules: (1) *natural processes*, (2) *degradation*, and (3) *restoration & mitigation (*Figure 1*)*.

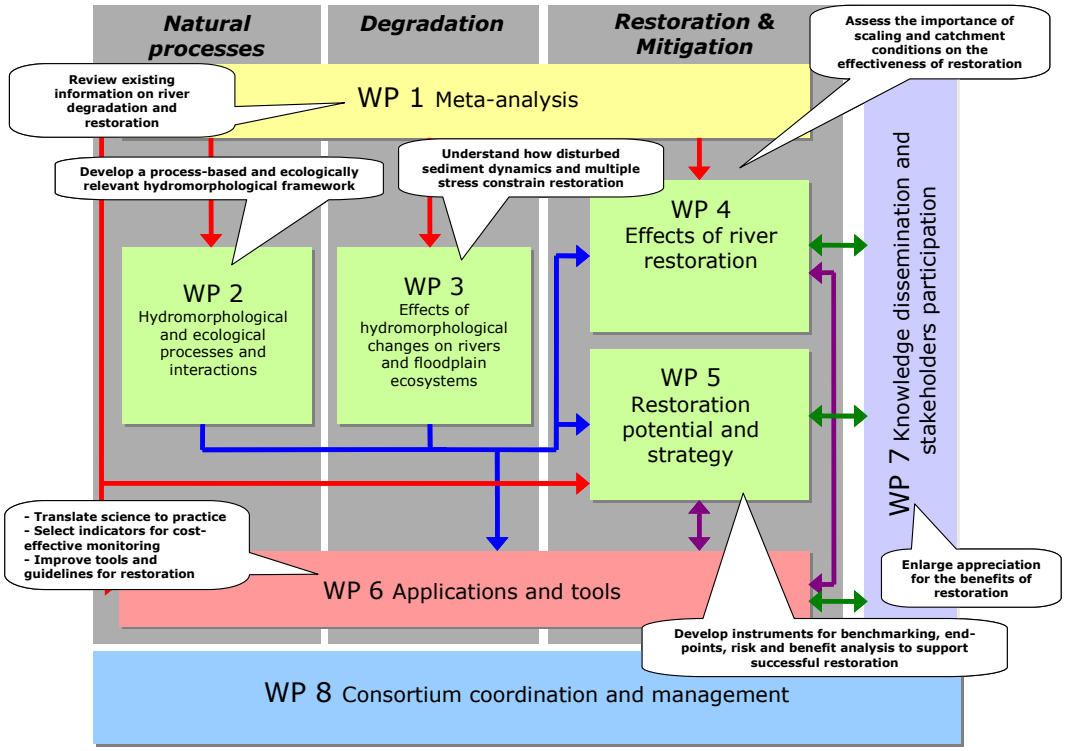

Figure 1 REFORM approach and outcome

As part of its objective to foster and maintain a dynamic exchange amongst stakeholders, REFORM has developed a web-based dissemination tool – the REFORM WIKI – that will benefit from stakeholder consultation to share experiences with specific river restoration measures (http://wiki.reformrivers.eu). The results of REFORM will be made available through this tool (Figure 2).

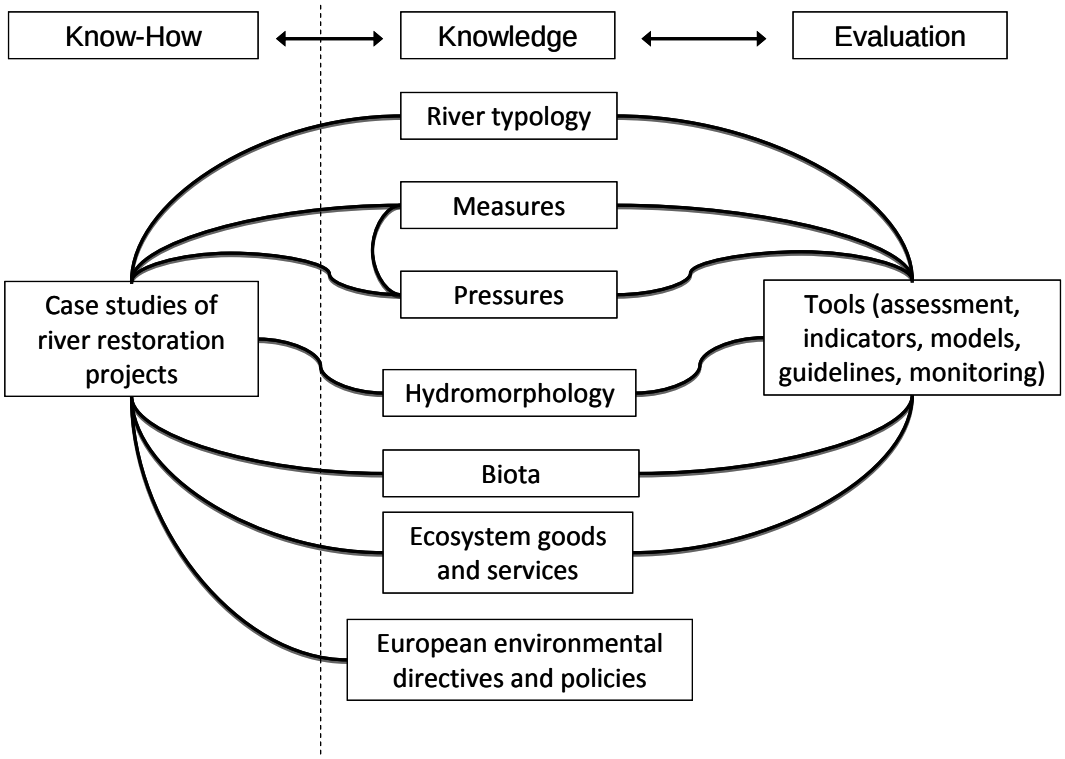

Figure 2 Structure of the REFORM WIKI

Table 1 below gives an overview of the status of the output from REFORM during its first 2 years (November 2011 – October 2013).

Table 1 Status of REFORM deliverables scheduled for the first 2 years (Nov 2011 - Oct 2013). N.A. = not applicable; website = www.reformrivers.eu

#	Description	Planning	Status	Where to find?	Will content be in WIKI?
D7.1	Communication and Dissemination Strategy	Jan-12	√	Website (results > deliverables)	No
D4.1	Field protocols and associated database	Apr-12	√	Submitted	To be decided
D7.2	project website: structure and functionality	Apr-12	√	www.reformrivers.eu	N.A.
D7.6	Project leaflet	Apr-12	√	Website in EN, ES, FR, GE and IT	No
D7.6	Project newsletters (8)	Every 6 months	√	Website: #1 and #2	No

#	Description	Planning	Status	Where to find?	Will content be in WIKI?
D1.1	Review on eco-hydromorphological methods	Oct-12	√	Website (results > deliverables)	**Yes**
D7.2	REFORM GEOWIKI	Nov-12	√	http://wiki.reformrivers.eu	N.A.
D2.1	Multi-scale framework and indicators of hydromorphological processes and forms	Jan-13	Test version		**Yes**
D1.2	Review on effects of pressures on hydromorphological variables and ecologically relevant processes	Feb-13	Final draft		**Yes**
D1.3	Review on ecological responses to hydromorphological degradation and restoration	Feb-13	Final draft		**Yes**
D7.7	Policy brief (3)	Every 16 month #1: Feb-13	In prep		No
D7.3	Proceedings of the End-user workshop	Mar-13	In prep		No
D5.1	Review of methodologies for benchmarking and setting end-points for restoration projects	Apr-13	1st draft		**Yes**
D6.1	Synthesis of interim results for practical application to support the compilation of the 2nd RBMPs	Apr-13	In prep		**Yes**
D1.4	Inventory of the cost of river degradation and the socio-economic aspects and costs and benefits	Oct-13	1st draft		**Yes**
D2.3	Framework to analyse ecosystem services provided by European river systems	Oct-13	1st draft		**Yes**
D3.1	Impacts of hydromorphological degradation and disturbed sediment dynamics on ecological status	Oct-13	In prep		**Yes**
D4.2	Evaluation of hydromorphological restoration from existing data	Oct-13	In prep		**Yes**

1.2 *Aims of the stakeholder workshop*

The technical and interactive Stakeholder Workshop on River Restoration to Support Effective Catchment Management was held on 26-27 February 2013 at the Hotel Silken Berlaymont in Brussels (http://www.reformrivers.eu/events/stakeholder-workshop). Its main aim was to **provide a platform for consultation and exchange between**

REFORM scientists, European technical experts working on river degradation and restoration, and members of the WG A Ecological Status (ECOSTAT) of the CIS for the WFD (2000/60/EC).

A discussion paper was prepared for the workshop (available at http://www.reformrivers.eu/events/stakeholder-workshop/documents). The purpose of the discussion paper was to stimulate dialogue at the event by providing a progress update on the REFORM results with brief problem descriptions and conclusions from the main work-packages, as well as establishing connections between the workshop programme and the REFORM deliverables.

In addition, an online forum was set up a few months before the Stakeholder Workshop and stakeholders interested in the event were invited to submit their own key questions and concerns on impacts of hydromorphological modifications and river restoration for their inclusion in the event discussions.

Approximately 110 participants attended the workshop and thirteen speakers presented wide-ranging points of view on the topics of river degradation and restoration. Twenty-three European countries, including national administrations and other stakeholder groups, were represented.

At the workshop, the first results of REFORM were presented and the invited experts had the opportunity to give their feedback during breakout sessions. One of the goals of these sessions was to gather stakeholders' perspectives on how the management tools and approaches created by the project can contribute to the next round of RBMPs.

The workshop presentations are available at the workshop website:
http://www.reformrivers.eu/events/stakeholder-workshop/programme

The workshop was an interactive event with parallel working groups addressing different topics relevant to the various types of rivers and pressures across Europe. The parallel groups addressed REFORM's outputs and plans for the next stages of the project and also reflected on relevant activities in European countries.

1.3 About this summary report

In the following sections (sections 2 - 5), this summary report provides an overview of the key issues raised during the workshop sessions both in plenary and in breakout groups.

In section 6, some considerations are reported on what REFORM can do explicitly about the issues raised, in particular as priority recommendations/requests of stakeholders to the project.

The final section 7 of this report provides an outlook and overall impression of the REFORM stakeholder workshop.

2. Towards effective river restoration in Europe

In the opening plenary session I, keynote speeches were given by the REFORM partners, the EEA, and the CIS WG ECOSTAT leaders. The presentations covered:

- Introduction to the REFORM project
- Challenges and bottlenecks for river restoration with reference to the 1st river basin management plans (RBMPs)
- Strengths and limitations of hydromorphological assessment methods
- Methods for understanding the root causes of degradation
- Evidence of success of river restoration measures
- Discussion of a European multi-scale ecohydromorphological assessment framework
- Key conclusions from the EEA State of Water 2012 report on "Hydromorphological alterations and pressures"
- Recall of the key outcomes of the ECOSTAT workshop on Hydromorphology, June 2012

The workshop presentations are available at:
http://www.reformrivers.eu/events/stakeholder-workshop/programme
The key issues raised during questions and discussions in this session addressed the following:

- **Scale of the EEA assessment of pressures and status**: The question was raised why the overview of data on pressures and status is given according to water bodies and not kilometres. According to the EEA, an assessment based on kilometres would give nearly the same results.
- **Habitat bottlenecks as faunal filters** (see presentation of Christian Wolter, Leibniz-Institute of Freshwater Ecology and Inland Fisheries): Clarification was requested whether the habitat faunal filters apply in the same way in all locations or whether there are differences from water body to water body. It was explained that the habitat bottleneck approach presented shows a general hierarchy of faunal filters in Europe but the hierarchy of filters could vary in different locations.
- **Indicators of rapid success**: Considering that river restoration is a lengthy process, a question was raised on the development of indicators which show that the right ecological processes are starting to develop. Indeed, there is a need for indicators of rapid success, which will be purely based on hydromorphology. In terms of biological elements, there might be some species that can be used as early indicators.
- **Delineation of reaches**: Referring back to the delineation of reaches in the multi-scale ecohydromorphological assessment framework developed in REFORM, the

question was raised whether there are thoughts to use the water bodies according to the WFD and whether these could be the same size as the reaches in the framework. Within REFORM, the reach is being examined in its catchment context. In test catchments of REFORM, there will be data available on water bodies and these will be compared to reaches, thus associating the two data sets.

- **Involvement of stakeholders in case studies**: Clarification was requested whether local project managers and stakeholders are involved in the design of the REFORM case studies to reflect their views on the degree of success of their restoration projects. It was clarified that this is being considered in the activities of WP4 of REFORM.



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3. Interactive breakout sessions on key types of European rivers

Session III comprised interactive breakout sessions on different types of European rivers (lowland, highland/midland and Mediterranean) aimed at making an inventory of the most important and relevant issues in the view of the participants, reflecting key problems relevant to the assessment and management of hydromorphological pressures and restoration, approaches already applied by Member States and stakeholders to address key problems as well as recommendations for the work programme of REFORM.
In a second step, the inventory of these issues was used to prioritise the fundamental issues through group consensus (method of pyramidal learning) (see Annex II on moderation methods).

3.1 Lowland rivers

Introduction and discussion points
The intent of this session was to cover key questions regarding the important hydromorphological pressures and restoration and mitigation measures in lowland rivers across Europe, such as: changing planform, meandering to straight, hardening river banks, deepening channels, main and side channels and their relation in various senses as well as sediments, riparian zones and floodplains, agriculture, floods, water abstraction, small-scale run-of-river hydropower, and navigation drivers. The following main discussion points were initially remarked:

- What are the key factors constraining/impeding ecosystem functioning and restoration processes?
- Issues currently unresolved in RBMPs for lowland rivers and key hydromorphological measures for the 2nd round of Programmes of Measures (PoMs)

- River restoration in catchments largely affected by land use changes (especially by agriculture). Successful experiences and future approaches for restoration at the catchment and at a more local scale
- Should restoration in low energy rivers be process-based or pattern-based?

Summary of major issues (post-it inventory)
This section summarizes the issues which the group participants considered as important/relevant (inventory of total of 81 post-its) divided and summarized in two categories: (1) problems/open questions; (2) approaches and recommendations/requests to REFORM.

Problems/open questions and approaches
Methods or tools to …

1. underpin and determine cost effectiveness of measures
2. understand (a)biotic processes and ecosystems functioning in low-energy rivers
3. compare effectiveness of different measures and prioritise most suitable approaches for addressing specific pressures- also in an international context
4. deal with quality standards (requirements) for (a)biotic key factors and maintenance (vegetation, discharge, size, length, location, scale)
5. deal with multiple pressures and lack of reference data
6. describe and assess maximum ecological potential in degraded rivers
7. determine best indicators and measure effects/influence on biological status
8. showcase economic advantage and quick wins and determine cost-sharing between agriculture, infrastructure (flood mitigation, hydropower, nature conservation) and urbanisation
9. focus on short term effects and successes

Approaches and recommendations/requests to REFORM

1. Improve awareness of the value (ecological, social, economic) of river restoration with the public (ecosystem services) or water managers, link river restoration to different regional drivers, raise more money for river restoration and illustrate broader perspectives of river restoration with other stakeholder groups
2. Enlarge the domain of survey and actions by REFORM, e.g. estuaries?
3. Determine the target group of REFORM and avoid information load, as well as integrate with the Life+ RESTORE project
4. Avoid giving subsidies that are counter-productive to the WFD outcomes
5. Use transboundary approaches in international context

Results of prioritisation (pyramidal learning)

The results of the group prioritization of issues (pyramidal learning) are divided in two main categories, i.e. (1) problems /open questions; (2) recommendations/requests to REFORM.

Due to the large number of issues raised during the post-it inventory (see above), the working group on lowland rivers followed a slightly different working method than other working groups. The participants were not informed of the outcomes of the post-it inventory, and thus were not aware of the thoughts of the entire group, when developing the prioritisation of issues.

Priority problems and open questions

1. Lack of public awareness (ecosystem services, why do we have to set measures?)
2. Lack of political will (short term political and economic objectives)
3. Lack of money (who is going to pay?)
4. Lack of land (availability) and incentives
5. Knowledge (setting priorities; knowledge transfer)
6. Some countries need a methodology for assessing status of rivers
7. Developing pressures (shipping, hydropower, housing) lead to habitat loss
8. Invasive species and changing environment (climate change) cause change in morphology and ecology
9. Legacy issues causing polluted water and sediments
10. Making river restoration a normal approach is compounded by financial pressures and difficulties of setting priorities within the catchment
11. Lack of opportunities for river restoration (limited space and money, severe alterations)
12. Process based approach is needed. How do we match river restoration and flood defense?
13. How to find an optimal trade-off between ecological and socio-economic benefits? Existing users pose a constraint for river restoration
14. How to prioritise between rivers, river basins and catchment EU-wide? What is a fair and consistent model-approach?
15. Present monitoring is expensive. Are there simpler, cost effective approaches that allow communication of successful changes?

Priority recommendations and requests to REFORM

1. Need for decision support tools which emphasise benefits of river restoration to stakeholders and ease of delivery
2. Address policymakers and potential funders and pay more attentiion to blue-green aspects such as protection of water supply, flood mitigation, nature conservation

3. Emphasise ecosystem functioning/services approaches which ease understanding and may lead to quick wins
4. Better examples of natural functioning (beyond national borders) to allow issues such as fine sediment to be addressed
5. River restoration should be process led within a catchment scale approach – need to account for cumulative impacts
6. Quantify ecological and hydromorphological benefits to provide more practical tools
7. REFORM should provide watertight justification for evaluation of critical projects to enable assessment of timescale dependent improvements
8. Contribute to improving public awareness on benefits of river restoration (political will…)
9. Explore opportunities for river restoration (space, money…) through integration with other sectoral developments such as flood mitigation, nature conservation, navigation, agricultural practices
10. Develop tools and opportunities to maximise the success of river restoration (DSS, stakeholder involvement....)


3.2 *Highland/midland rivers*

Introduction and discussion points

The intent of this session was to cover key questions regarding the important hydromorphological pressures and restoration and mitigation measures in highland/midland rivers across Europe such as: land use change, hydropower, storage pressures, flow disruptions, break of continuity, and sediments. The following main discussion points were initially remarked:

- What are the key factors constraining/impeding ecosystem functioning and restoration processes.
- Integration of hydropeaking and flushing flows in medium and long term decision making (river basin management planning).

- Issues currently unresolved in RBMPs for highland/midland rivers and key hydromorphological measures for the 2nd round of PoMs.

Summary of major issues (post-it inventory)

This section summarizes the issues which the group participants considered as important/relevant (inventory of total of 89 post-its) divided and summarized in two categories: (1) problems/open questions and approaches; (2) recommendations and requests to REFORM.

Problems/open questions and approaches

1. Spatial and temporal scales

- Spatial scales, downscaling/upscaling
- Importance of temporal context and historical analysis
- Indicators of prolonged pressures and multi-stressors
- Continuity: need to consider process direction in time and space
- Need for indices on multiple scales (time, spatial)

2. Hydromorphological assessment

- Conflicts between detailed data vs. national coverage
- Hydromorphological assessment is often limited by financial and time constraints
- Morphological classification
- Hydromorphological quality assessment
- Need to combine data from remote sensing with field-based surveys
- Assessing effects of climate change
- Morphological and hydrological impacts of land use
- Assessing artificial reservoirs
- Evaluation of severely altered reaches
- Designation of heavily modified water bodies (HMWB)

3. Longitudinal continuity

- River continuity, including sediment and fish, and sediment deficit
- Using catchment scale sediment budget models to address impact of sediment discontinuity

4. Thresholds and sensitivity to changes

- Process thresholds and sensitivity to changes
- Regulated streams and recovery period

5. Biological response to hydromorphological pressures

- Sampling biological response

- Indicators for ecological status in changing conditions
- Links between biological response and hydromorphological pressures
- Methods for hydromorphological assessment and biological response
- Need for indices to link hydromorphology and biota

6. Prioritization

- Prioritization of problems in a river reach
- Prioritization in restoring continuity starting from larger rivers
- Need for a prioritization framework including principles from economic/ecosystem service approach

7. Mitigation / Restoration measures

- Effects of barrier removal on sediment
- Effects of morphological restoration on sediment transport
- Mitigation measures (general) and measures to improve status
- Mitigation measures for sediment transport, including bedload continuity in hydropower reservoirs
- Hydropower: tools available to assess benefits of measures for fish and sediment passage
- Examples of successful mitigation of hydropower impacts
- Information quantity and quality for restoration planning
- Costs of river restoration and need for criteria to evaluate efficiency
- Success of restoration project
- Restoration of urban streams
- Correlations between restoration and improvement of biological elements
- Complexity in evaluating response of macrophytes to restoration measures
- Developing knowledge and tools on how to apply ecosystem services to restoration planning

Recommendations and requests to REFORM

The highest number of requests falls under the categories of hydromorphological assessment and restoration measures.

1. Scales

- Need for multi-scale and within a basin approach
- Reach vs. water body hydromorphological assessment
- Restoration must take into account a relevant section of the river

2. Hydromorphological and ecological indicators and assessment

- Make reference to CEN standards on river hydromorphology
- Assessment of riparian quality for the entire river corridor along the whole water body

- Need for good ecological methods to detect the impact of hydropower on ecological quality
- Hydromorphological indicators significant for the achievement of good status of individual biological elements
- Need for a good evaluation method of hydromorphology and habitats
- Accounting for suspended material in rivers within hydromorphological assessment
- Recommendations on limitations and strengths of national assessment methods

3. Thresholds and sensitivity to changes

- Development of state transition models for river styles
- Identify catchment/segment/reach characteristics related to resilience to river forms and thresholds among forms

4. Biological response to hydromorphological pressures

- Addressing synergistic effects in understanding biotic responses to hydromorphological pressures

5. Prioritization

- Development of methods for prioritization and selection of measures
- Establish a system to determine what is most important for a river reach and make it understandable to the broad public

6. River restoration, management, ecosystem services

- Taking into account coarse sediment transport in restoration projects
- Including cost-effectiveness analysis
- Consider costs of past hydromorphological alterations
- Consider methods to assess socio-economic effects of restoration projects
- Development of an inexpensive method for restoration monitoring
- Recommendations on measures according to different river types
- Importance of natural river patterns for success of river restoration and achievement of good status
- Design of mitigation to restore habitat maintenance processes downstream reservoirs
- Assessment of effects on water and ecological quality following dam removal
- Quantitative evidence of benefits of hydromorphological restoration including effects on flood risk
- Evaluate biodiversity before and after the restoration programme
- Evaluate potential of recolonisation
- Consider value of old weirs

Results of prioritization (pyramidal learning)

Priority problems and open questions

Most of problems identified as priorities are not specific to highland/midland rivers but are of general application to all types of streams. An exception is the particular emphasis on sediment transport, which is important for all types of streams, but bedload and its alteration related to transversal structures (dams, hydropower) is of particular importance in steep gradient streams.

1. Hydromorphological assessment

- Spatial scales: how can we resolve upscaling problems; which indicators can be applied to river reaches and to catchments; what is an 'effective' size for a restoration project?
- Evaluating processes of sediment continuity, both longitudinally and laterally, and from the catchment to the reach
- What constitutes "good" sediment transport, and what tools (at minimum cost) can be used for measuring it?
- In times of economic recession, how should we design restoration monitoring programmes that truly measure success while also being cost-effective?
- Should we try to develop truly integrated methods of hydromorphological assessment for river restoration, when river flow may be more susceptible to management and regulation than river morphology?

2. Restoration and ecosystem services

- How to identify restoration success, what ecological and hydromorphological indicators can be used; need to better understand temporal and spatial scales; need to consider the expectations of a given project
- Can we or should we design restoration work to benefit individual species of conservation concern?
- Ecosystem services and river restoration: what are the cost – benefits; use of an ecosystem approach, demonstrating the value, not just the benefits, of ecosystem services in restoration; need to account for the cost of past hydromorphological alterations

Priority recommendations and requests to REFORM

1. Hydromorphological indicators and assessment

- Recommendations on ecological indicators of hydromorphological impacts
- Need for better understanding of cause-effect relationships between hydromorphological and biological indicators
- Need for sediment assessment methods
- Improve knowledge on sediment continuity issues (effects, management measures, barrier removal, etc.)

- Hydromorphology needs a stronger role: often there are not enough tools to cope with degradation

2. River restoration, management and ecosystem services

- Need for general framework accounting for ecosystem services
- Management aspects of sediment continuity
- Need for development of methods to assess socio-economics effects on public, benefits, stakeholders, synergies with different directives and flood risk management
- Need for a cost-effective method for river restoration monitoring, in terms of spatial and temporal scales and key indicators, when and where to assess them
- Develop prioritization tools for river restoration measures, specially for morphological interventions

3.3 *Mediterranean rivers*

Introduction and discussion points

The intent of this session was to cover key questions regarding the important hydromorphological pressures and restoration and mitigation measures in Mediterranean rivers across Europe such as: flow regulation and water storage (dams, reservoirs), water withdrawal (e.g. potable supply, irrigation, power generation, intercatchment transfer), and sediment retention. The following main discussion points were initially remarked:

- What are the key factors constraining/impeding ecosystem functioning and restoration processes?
- Environmental flow regime definition (in intermittent rivers, connected to hydropeaking, flushing flows); Successful experience with minimum flow regime establishment (role of consultation)
- Integration of hydropeaking and flushing flows in medium and long term decision making (river basin management planning)
- Successful experiences with measures for sediment management in reservoirs

- Issues currently unresolved in Mediterranean rivers and key hydromorphological measures for the 2nd round of PoMs

Summary of major issues (post-it inventory)

This section summarizes the issues which the group participants considered as important/relevant (inventory of total of 48 post-its) divided and summarized in three categories: (1) problems/open questions; (2) approaches/solutions; (3) recommendations and requests to REFORM.

Problems/open questions

1. Flow regulation

Specific impacts of flow regulation brought up by the group participants included sediment retention and management and vegetation encroachment. In turn, key issues related to flow regulation include the fact that reservoir management is targeted to economic sectors and not to aquatic ecosystems and that the definition and implementation of environmental flows is in general pending.

2. Water abstraction

Water abstraction was identified as a key issue due to the usually limited natural resources in Mediterranean areas as compared to high water demands. Moreover, expected climate change effects, including the increased duration of droughts, should be taken into consideration. Irrigation was identified as the major use for water abstracted from Mediterranean rivers. Other specific impacts of agriculture brought up in the working group were the occupation of floodplains, the modification of drainage networks for the development of irrigation projects and illegal water abstraction.

3. Other issues

- Impact of urbanization and specifically of gravel extraction on rivers
- Estimation of natural and environmental flow regimes in temporary and intermittent streams for water use permits
- Restrictions for river management in privately-owned lands
- Need for flood management.

Approaches/solutions

The topics discussed included objective setting both for surface and groundwater bodies: for surface waters, through the implementation of environmental flow regimes, and, in the case of groundwater, by giving more weight to quantitative status for the granting of water abstraction permits. It was pointed out that operational water management needs supporting tools for the definition of environmental flows and that it should incorporate environmental flow requirements comprising aspects such as bankfull and flushing flows and not be limited to minimum flows. In addition to this, demand management was proposed as an approach to reduce the impacts derived from water abstraction. In the case of agriculture, the implementation of adequate water-pricing policies and the elimination of subsidies for crops that demand more water were discussed as possible options. Finally, on the issue of sediment retention, dam management that allows for its release was mentioned as an approach, specifically during floods.

Recommendations and requests to REFORM

1. Guarantee that REFORM results are directly applicable to the Mediterranean region

Specific actions that came up for including Mediterranean rivers across the project were checking whether these rivers fit into the ecohydromorphological framework, using pilot catchments from Mediterranean regions and, where appropriate, specifying the results obtained for these rivers in the deliverables, for example for river typology and pressure-response analyses.

2. Provide guidance for the establishment of environmental flows

It was suggested that REFORM should provide guidance on the definition of environmental flows and on the design of mitigation and restoration measures to improve flow regimes. The approach should be easy to implement across Europe and specifically address aspects relevant to Mediterranean rivers such as hydropeaking, flushing flows and intermittent and temporary streams.

3. Other recommendations

Finally, other recommendations were to take into consideration the interaction between groundwater and surface water and to contribute to giving more weight to hydromorphological quality elements in ecological assessments.

Results of prioritisation (pyramidal learning)

Priority problems and open questions

1. Flow regulation

Flow regulation was identified as a widespread pressure that has led to the alteration of flow regimes in all but a few remaining free-flowing stretches of river and, in some areas, to the creation of complex systems of continuous and interlinked artificial lakes. In particular, sediment retention and vegetation encroachment were singled out as derived impacts. The future increase of the magnitude of flow regulation impacts was brought up as an issue, given the fact that new regulation infrastructures are currently under construction and in the planning phase. Removal of non-operational dams and weirs was proposed as a partial solution to reduce the magnitude of existing hydrological impacts.

2. Water abstraction

Water abstraction was given the highest priority by one of the two subgroups of participants. This subgroup suggested that the problem may become more relevant in the future due to the rise of water demand and due to the effects of climate change, which may be especially significant in Mediterranean areas and may result in an increase of drought severity.

3. Land use

Additionally, the impacts derived from land use both at the floodplain and the catchment scale were identified as a problematic issue especially in agricultural areas, and particularly in heavily irrigated regions.

4. Definition and implementation of environmental flow regimes

In particular, the question of how to implement them while attending water demands was raised.

5. Sediment management
6. Flood management, specifically flash flood management

Priority recommendations and requests to REFORM

1. Inclusion of Mediterranean rivers across the REFORM project

Regarding conceptual aspects, REFORM should ensure that the unique characteristics of Mediterranean rivers are represented in the ecohydromorphological assessment framework, in hydromorphological assessment methods and in general in the guidelines developed as part of the project. Besides, REFORM should guarantee that Mediterranean rivers are represented in the project WIKI and in case studies.

2. Development of guidance on the definition of environmental flows

There was a request to REFORM to develop guidelines for environmental flow definition, and explicitly for regions with severe water stress. The methodology(ies) to be proposed should take into account the hydrological specificities of Mediterranean streams, including flow seasonality and river intermittency and the alteration of flow regimes associated to hydropeaking.

3. Level of degradation and restoration objectives

Finally, one of the two subgroups of participants recommended that the level of degradation of rivers should be taken into consideration when setting restoration objectives in the guidelines to be developed in REFORM.

4. Interactive breakout sessions on thematic topics

The second part of session III of the workshop comprised breakout sessions on thematic topics (multiple-pressure settings, programme of measures and HMWB). The interactive methods of silent discussion and MoSCoW prioritization were used to facilitate the exchange (see Annex II). During the silent discussion, participants were organized in groups of 6-8 persons, and each person noted down a question or statement connected to the key topic of the session. This was passed in sequence around the table for refinement and comment by the other participants. In the end of the round table, the original author could amend and reflect on the written discussion.
In a second step, all questions or statements of participants were presented and prioritized (using a colour voting system in the categories of "Must be addressed", "Should be addressed", "Could (issue desirable but not necessary)" and "Won't (issue will not be implemented but may be considered in the future)". According to the voting results, the questions or statements were allocated an order of prioritization.


4.1 *Unraveling the impact of hydromorphological pressures in multiple-pressure settings*

Introduction and discussion points
This session addressed cause-effect issues (e.g. DPSIR in multi-pressure environments). The following main discussion points were initially remarked:

- What are your views on disentangling hydromorphological pressures from one another and from other types of pressures?
- What do you need to manage hydromorphological pressures in multi-pressure systems? What influence does the delivery of the 2nd round of RBMPs have on your requirements?
- How would you develop road maps that deliver hydromorphologically sensitive indicators for the biological quality elements?

Key issues raised in the silent discussion

Although participants represented a wide range of riverine interests, key themes emerged in the discussion which were further elaborated in the MoSCoW prioritisation. Not surprisingly many end-users made requests for practical tools which could be used in decision making processes and communication with local and national stakeholders. There were concerns about the lack of data and the lack of knowledge regarding the response of BQEs to hydromorphological pressures in a multi-pressure context.

Prioritisation of key issues (Results of the MoSCoW)

The results from the prioritisation were totaled as weighted averages of the categories. Below are the results, reported in the words (abridged) of the participants.

Essential to address (Must do)

1. Some data exists to help appraise the impact of catchment-driven processes and pressures. However, we need robust ways to confidently demonstrate success of measures.
2. Derive the best suite of BQE based on their response to abiotic variables. Use targeted monitoring to refine existing metrics.
3. Hydromorphological data are lacking. Exploit existing data (DTM, satellite, monitoring) to characterise river networks at catchment/regional scale, then prioritise field campaigns to collect integrated fluvial geomorphological information over time

Desirable to address (Should do)

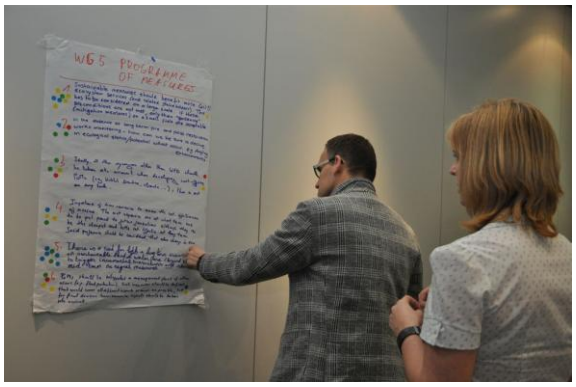
1. Disentangling the effects of hydromorphological pressures will require compiling complex databases. These should include empirical and modelled data. Gradient and control-impact designs should be put in place to answer specific questions.
2. Further research is needed to estimate the effects of pressures on BQE
3. It may not always be necessary to fully disentangle synergistic effects. Where it is, however, rigorously designed and controlled (BACI) field studies, perhaps combined with appropriate models, offer the best chance of success.

Informative (Could do)

1. Agriculture is considered a major determinant of river restoration success. How do we identify and prioritise which agricultural stressor to target?
2. What modelling tools are available to assess the effects of upstream & diffuse hydromorphological pressures on a specific reach / point?
3. We must try to ensure that there are no losers! Decision making should be transparent, consistent, involve socio-economic concerns (incl. compensating land owners loss) as well as hydromorphological decisions. Decisions should outline anticipated positive outcomes.

Like to know but not necessary (Won't do)

1. Is it pertinent to restore hydromorphology when water quality is not good?
2. How do we assess the success of physical restoration when chemical quality is low?



4.2 *Designing programmes of measures*

Introduction and discussion points

This session covered scaling issues and programmes of measures for river basins. Discussion points:

- How to design cost-effective programmes of measures for river basins? What tools are needed to support this design?
- How do we estimate the effectiveness of some potential measures?
- How to start drafting the 2nd round of programmes of measures (PoMs) while the above-mentioned tools are still in development?
- Are the sets of measures considered for the first RBMPs enough for the drafting of the 2nd round of PoMs or are key measures for specific pressures still missing?
- How can we integrate PoMs with other users water resource needs and priorities, e.g. hydropower and flood prevention measures?

Key issues raised in the silent discussion

There were 26 statements prepared and discussed around the tables in the silent discussion. Regardless of their diversity, the main statements can be grouped around the following problems:

<u>Issue of effectiveness</u>

- Water planners need tools to estimate measure effectiveness (costs can be estimated in general with acceptable degree of uncertainty) and prioritise restoration action;
- Effectiveness of some potential measures could be estimated by morphological monitoring before and post works but it is necessary to estimate also the temporal scale of monitoring (control impact sites can be useful).

<u>Stressing multifunctional measures</u>

- It is important to work with multifunctional measures, with a cost effective perspective;
- The WFD and Floods Directive should be integrated to develop plans that will reduce the flood risk on one hand and improve the ecological status on the other hand;

- Integrating Programmes of Measures (PoM) with other water resource needs and priorities must be done at the level of the river basin district (Life is more than WFD);
- Sustainable measures should benefit more ecosystem services (and related stakeholders). This has to be considered on the large scale (or „gardening" only).

Ranking of practical solutions

- Hydromorphology is not fully understood by many local involved parties. A good example is sediment transfer which benefits both reservoir restoration and downstream erosion reduction.

Ambitions

- There is a need for both a long term vision on sustainable land and water use (beyond 2027) to trigger incremental transitions as well as short- and mid-term no-regret measures;
- Develop methods to ensure that each measure takes into account the time & space scales appropriate for hydromorphological process responses to be restored.

Prioritisation of key issues (Results of the MoSCoW)

Results can be viewed also as recommendations for action. The results from the prioritization were totaled as weighted averages of the categories.

Essential to address (Must do)

1. Water planners need tools to implement cost-effective PoMs. In general, costs can be estimated at the planning level with an acceptable degree of uncertainty. Tools for the estimation of effectiveness would be key in helping managers/planners to prioritize restoration actions, and would hopefully ensure consistency within RBDs and between different regions.
2. There is a need for both a long term vision on sustainable land and water use (beyond 2027) to trigger incremental transition and short- and mid-term no-regret measures. Native perspectives for users should be developed as supported by political commitments to act.
3. There is a need to develop methods/guidelines to ensure that each intervention or group of interventions takes into account the timescales & spatial scale that are appropriate for hydromorphological process responses to be restored. For example, expecting floodplain connection immediately after small dam removal does not take into account hydromorphological process responses and scales for channel morphology evolution.

Desirable to address (Should do)

1. We need both simple tools to identify post provisioning restoration measures and complex tools for detailed analysis. Simple tools should be science-based but could contain expert judgement as well.

2. The WFD and Floods Directive should be integrated to develop plans that will reduce the flood risks and improve the ecological status.

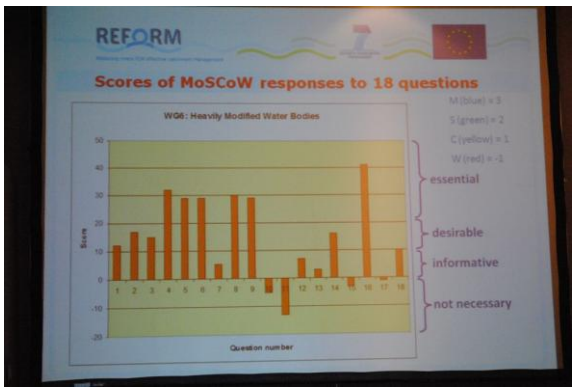
3. We can estimate the effect of potential measures using expert-judgement next to calculations and modelling approaches, but there is a need to complete the outcomes with recommendations on monitoring.

Informative (Could do)

1. River basin authorities must involve and be responsive to a wide range of stakeholders in identifying measures (e.g. scientists to make sure they have scientific rigor, stakeholders so that they understand the benefits and their role in making it happen, citizens and business). Political decisions i.e. final approved RBMPs should say why the final list of measures was selected (e.g. environmental, social, economical reasons) and be explicit.

Like to know but not necessary (Won't do)

1. We need the 2nd round of RBMPs to learn more about the cost-effectiveness of the measures of the 1st round. Therefore, we need tools and time so that we can evaluate the first set of measures taken and take more measures in the 3rd round of RBMPs. Make arrangements with Member States about evaluations.
2. To integrate PoMs with other users in one tool is too superficial, it will be better to publish a guideline which combines the different priorities. It will be useful to get an overview of which measures remain to be done on a river.



4.3 *Heavily modified water bodies*

Introduction and discussion points

This session covered target setting in highly modified environments (e.g. HMWBs)
Discussion points:

- How do we select the type and size of restoration and mitigation measures for Heavily Modified Water Bodies (HMWB)? How do we forecast the benefits of these measures in HMWBs?
- How can we quantify the influence of hydromorphology for HMWB, as this will set the scope for reaching good ecological potential (GEP)?
- Criteria for designation of HMWBs (based largely on expert judgement in the first RBMPs)
- Approaches for quantifying targets for GEP at water body level. Main indicators to be implemented for GEP definition
- Integrating river restoration with the socio-economic drivers modifying river ecosystems

Prioritisation of key issues (Results of the MoSCoW)

Essential to address (Must do)

1. Concrete practical guidance:
   - Use-based "starting point" mitigation with information on effectiveness
   - How to deal with lobbies from users? How can ecosystem services help in this?
   - Which hydromorphological measures have ecological benefits in the context of navigation and agriculture?
2. Understanding as a basis:
   - Targets based on processes and the future, not just on what is feasible
   - Meaning of "significant adverse effect on use" (not the same as "any impact on use"
3. Use natural processes for mitigation

Desirable to address (Should do)

1. Good definitions:
   - What can be achieved and what cannot?
   - Minimum criteria for HMWB conditions and possible GEP improvements
2. Good practice:
   - Use hydromorphology to define GEP (commonly monitored, yet not used)
   - Involve experts in developing mitigation; Monitor; Adapt

Informative (Could do)

1. Restoration in urban environments:
   - Limited possibilities, REFORM to provide guidance

2. Clear regulations and definitions:
    - "Easier" Prague method vs WFD biological method for defining GEP: define a minimum for GEP?
    - HMWB designation varies per country. Yet reservoirs and flood protection are generally important
    - Proper definitions of HMWB, GEP and good ecological status (GES)

Like to know but not necessary (Won't do)

1. Restoring small areas is a waste of money
    - Effectiveness affected by surroundings
2. Nothing lasts forever
    - Flexible formulations, considering that socio-economic values of present pressures might decrease
3. Uniformity across Europe:
    - Intercalibration (the target is harmonization of HMWB rather than intercalibration; this topic was left open for discussion: what exactly to be left to individual Member States?)

Disclaimer on the interpretation of group results:
It was pointed out that the identification of issues under the category "Like to know but not necessary (Won't do)" did not imply that participants found the corresponding points irrelevant. Participants were simply less interested in those issues and this was reflected in the outcomes of the voting in the group on Heavily Modified Water Bodies.

5. Knowledge sharing on hydromorphological degradation and restoration

Plenary session V of the REFORM Stakeholder Workshop was dedicated to presentations and discussions on forms of effective knowledge sharing and transferability of know-how on the topics of hydromorphological degradation and restoration.
Research on river restoration has produced a wealth of scientific information, but this information is still used insufficiently in restoration design and implementation. This is partly due to restricted accessibility, but also to the differences in the "language" used by river scientists and water managers. In this context, this session addressed ways to bridge the gaps in the transfer of knowledge between science and practice.

Keynote speeches were given on:

- The key hydromorphology-relevant findings of the recent European Commission assessment of the first RBMPs and main priorities for future action on European policy level (DG Environment of the European Commission)
- The science-policy interface (SPI) activity of the WFD Common Implementation Strategy (ONEMA)
- The REFORM WIKI, an open-access web-based knowledge management system, that will present REFORM results online, linking science to practice
- The communication and dissemination activities of the Life+RESTORE project, which promotes best practice on river restoration in Europe
- The core activities and the science-policy interface of the Common Implementation Strategy working group ECOSTAT

The workshop presentations are available at:
http://www.reformrivers.eu/events/stakeholder-workshop/programme
The key issues raised during the discussions in this session addressed the following:

- **Tools for knowledge sharing**: Ways to ensure the survival and update of tools, such as the REFORM and Life+RESTORE WIKIs (after project end), were raised as a crucial issue. The Life+RESTORE project will cooperate with the ECRR (European Centre for River Restoration) in terms of follow-up work. The ECRR is also a candidate future host for the REFORM WIKI. In addition, the EEA has expressed interest in the further dissemination of the REFORM project results.
- **Ecosystem services**: Ecosystem services were characterized as a fashionable idea as well as an educational issue. However, it was pointed out that according to recent surveys, people would like to have species conserved regardless of their value, thus the discussions on ecosystem services need to be balanced. Ecosystem services are

an especially powerful communication tool to proactively engage with sectoral actors, which is considered essential to support the implementation of the WFD.

- **Knowledge development and exchange on ecological flows**: The need was expressed to clarify the possible future work of REFORM on the topic of ecological flows, which is on the current agenda of the WFD Common Implementation Strategy. REFORM representatives explained that REFORM does not have a specific research focus on ecological flows. Nevertheless, the REFORM partnership will examine recent material published on EU level on this issue and will examine ways of additional contributions from REFORM. There is a wealth of expertise on ecological flows outside Europe already (Australia, US, South Africa). There is a need to connect existing research to case studies in Europe and the REFORM WIKI could be a possible place to do this.

- **Follow-up work on hydromorphology-relevant issues from 1st RBMPs**: The review of the 1st RBMPs has raised a number of issues on the designation of HMWB, the definition of good ecological potential and hydromorphological measures. The question was raised how these issues are being communicated to Member States and how improvements in the 2nd RBMPs can be coordinated. The European Commission is holding bilateral meetings with Member States to discuss shortcomings in the 1st RBMPs but, overall, there needs to be a broader understanding of limitations in the 1st planning cycle. Stakeholders are encouraged to read the individual Member State assessment reports and offer their expert help in filling in gaps. Exchange of experiences on national level also needs to be enhanced, to include available good practice that has not been part of Member State reporting yet.

Finally, the keynote speakers/panelists of session V gave the following key recommendations to the REFORM project:

- To be very concrete in formulating expectations especially on issues of science-policy interface relevant to the project. To this purpose, REFORM and the working group ECOSTAT will remain in close contact
- To engage with and disseminate results to sectoral actors
- To dedicate resources for transferring REFORM scientific outputs to the relevant policy and practitioner communities
- To provide, where possible, information on the quantification of benefits of restoration projects to ongoing European Commission activities (both REFORM and Life+RESTORE projects)
- To provide recommendations on further science gaps which need to be resolved as a priority to deliver the WFD

6. How will REFORM address the issues raised?

This section presents tables with considerations on what REFORM can do explicitly about the issues raised as priority recommendations/requests to the project by stakeholders during the workshop (see relevant lists in previous sections of this report). The tables provide information on whether REFORM will address each specific recommendation/request, giving an indication of the relevant deliverables and the expected time of their publication on the REFORM website (http://www.reformrivers.eu).

The indications below should not raise the unrealistic expectation that REFORM can and will cover all aspects for all types of European rivers. The research within REFORM is primarily based on compiling and analysing existing data and there is only limited collection of new data and experimental research. This was an explicit precondition of the FP7 research call. Thus, the outcomes of REFORM strongly depend on project data collected to study the impacts of degradation or benefits of restoration. We aim to give as wide coverage as possible, but this very much depends on the data availability (including access and permission to use them). To link all the sources of information, the structure of the WIKI (Figure 2) is designed to connect case studies to conceptual understanding and assessment tools. In that way it is clear where case studies are located and thereby which sort of rivers they represent and on the other hand which tools and methods can be applied to assess particular aspects of river degradation and restoration. The WIKI is dynamic and online accessible and thus easily adapted when new insights or information become available.

Table 2 Issues related to lowland rivers (WG1)

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
1.1) Decision support tools which emphasise benefits of river restoration to stakeholders and ease of delivery	DSS tools will be developed in WP5 and 6 and based on the socioeconomic components in WP2, 4 and 5	D5.1 Review of methodologies for benchmarking and setting end-points for restoration projects	April 2013
		D5.4 Risks and uncertainty of different restoration strategies and options analysis	April 2015
		D5.2 Cost effective restoration measures that promote wider ecosystem and societal benefits	April 2014
		D6.1 Synthesis of interim results for practical application to support the compilation of the 2nd RBMPs	April 2013
		D6.3 Guidelines and decision support for cost-effective river-floodplain restoration and its benefits	Oct 2015
1.2) Address policymakers and potential funders and pay more attentiion to blue-green aspects such as protection of water supply, flood mitigation, nature conservation	Policy support for these topics are addressed in WP5	D5.2	April 2014
		D5.3 Effects of climate and land use changes on river ecosystems and restoration practices	Oct 2014
1.3) Emphasise ecosystem functioning/services approaches which ease understanding and may lead to quick wins	Ecosystem functioning and services are addressed in WP 2, 4 and 5.	-	
1.4) Better examples of natural functioning (beyond national borders) should allow issues such as fine sediment to be addressed	Natural functioning of rivers is the key topic of WP2	D2.1 Multi-scale framework and indicators of hydromorphological processes and forms	Oct 2014
		D2.2 Influence of natural hydromorphological dynamics on biota and ecosystem functioning	Jul 2014

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
1.5) River restoration should be process led within a catchment scale approach – need to account for cumulative impacts	A process-based framework is developed in WP2. Catchment issues of river restoration are addressed in WP4	D4.2 Evaluation of hydromorphological restoration from existing data	Oct 2013
		D4.5 Fact sheets for restoration projects Also D 2.1 and D 2.2	Oct 2014
1.6) Quantify ecological and hydromorphological benefits to provide more practical tools	Benefits of natural functioning and river restoration are addressed in respectively WP2 and WP4. WP6 delivers the practical tools	D6.3 Guidelines and decision support for cost-effective river-floodplain restoration and its benefits.	Oct 2015
		D 2.2, D 4.5 and D 5.1	See above
1.7) REFORM should provide watertight justification for evaluation of critical projects to enable assessment of timescale dependant improvements	Benchmarking and endpoints of river restoration are addressed in WP5. We will not produce any "watertight justifications"	D 5.1	April 2013
1.8) Contribute to improving public awareness on benefits of river restoration (political will…)	REFORM is a RTD project and will increase awareness by disseminating knowledge and know-how on ecosystem services of natural rivers, river degradation and restoration. It will communicate its results through the REFORM WIKI, WP6 and WP7	D7.3 Proceedings of the End-user workshop	Mar 2013
		D7.4 Lecture notes of the summer school	Apr 2015
		D7.5 Proceedings of the final conference	Aug 2015
		D7.7 Policy Briefs and policy discussion papers	(3; every 16 months)
		wiki.reformrivers.eu Also D 5.2 and D 6.3	
1.9) Explore opportunities for river restoration (space, money…) through integration with other sectoral developments such as flood mitigation, nature conservation, navigation, agricultural practices	See recommendation 1.1)	In particular D 5.2 and D 5.3	See above
1.10) Develop tools and opportunities to maximise the success of river restoration (DSS, stakeholder involvement....)	See recommendation 1.1)	In particular D 4.5, D 5.1, D 5.2, D 5.4, D 6.1 and D 6.3	See above

Table 3 Issues related to highland/midland rivers (WG2)

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
HYDROMORPHOLOGICAL INDICATORS AND ASSESSMENT			
2.1) Recommendations on ecological indicators of hydromorphological impacts	This is a central issue in the REFORM project. A series of deliverables contain some review and analysis of ecological response to hydromorphological pressures in WP1 and 3. An identification of suitable ecological and hydromorphological indicators is then the aim of WP6.	D1.2 "Review on effects of pressures on hydromorphological variables and ecologically relevant processes"	Feb 2013
		D1.3 "Review on ecological responses to hydromorphological degradation and restoration"	Feb 2013
		D3.1 "Impacts of hydromorphological degradation and disturbed sediment dynamics on ecological status"	Oct 2013
		D3.2 Understanding biological responses to degraded hydromorphology, sediment dynamics and multiple stress.	Oct 2014
		D6.2 "Final report on methods, models, tools to assess the hydromorphology of rivers"	July 2015
2.2) Need for better understanding of cause-effect relationships between hydromorphological and biological indicators	This is a key issue in REFORM, and will be addressed specifically in most of the deliverables in WP 2 and WP3	D 1.2, D 1.3, D 3.1 and D 3.2	See above
		D2.2 Influence of natural hydromorphological dynamics on biota and ecosystem functioning	Jul 2014
2.3) Need for sediment assessment methods	REFORM recognizes the importance of sediment assessment. This topic is covered in WP2 where sediment size and transport are key issues in	D2.1 Multi-scale framework and indicators of hydromorphological processes and forms.	Oct 2014

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
	developing the framework. The practical applicability of methods is addressed in WP6.	D6.2 "Final report on methods, models, tools to assess the hydromorphology of rivers"	July 2015
2.4) Improve knowledge on sediment continuity issues (effects, management measures, barrier removal, etc.).	As for the previous point, sediment continuity is a crucial issue in REFORM, and addressed in many tasks and deliverables, primarily in WP 2 and 6. Alteration of sediment fluxes and its effects on ecology is addressed in WP3. Restoration measures in WP4.	D 1.2, D 1.3, D 2.1, D 2.2, D3.1 and D 3.2	See above
		D4.2 Evaluation of hydromorphological restoration from existing data	Oct 2013
		D4.5 Fact sheets for restoration projects	Oct 2014
2.5) Hydromorphology needs a stronger role: often there are not enough tools to cope with degradation	REFORM addressed the recognition that hydromorphology needs a stronger role for achieving WFD objectives. HyMo degradation is a central topic in REFORM, with WP3 dedicated to this issue and with other WPs (WP1, WP2 and WP6) related to it.	D 1.2, D 1.3, D 2.1, D 2.2, D3.1, D 3.2 and D 6.2	See above
RIVER RESTORATION, MANAGEMENT AND ECOSYSTEM SERVICES			
2.6) Need for general framework accounting for ecosystem services	Ecosystem services are part of several REFORM WPs (2, 4 and 5). Within WP2 a coherent framework will be developed to link ecosystem services to hydromorphological status of rivers. The framework is applied within the case study catchments of WP4.	D2.3 Framework to analyse ecosystem services provided by European river systems	Oct 2013
		D4.4 Report on the results of the socio-economic survey	Apr 2014
		D5.2 Cost effective restoration measures that promote wider ecosystem and societal benefits	Apr 2014
2.7) Management aspects of sediment continuity	Management of sediment continuity is a key issue in hydromorphological restoration. WP2, WP4 and the WIKI address sediment budgets and options for improvement.	D 2.2, D 4.2, D 4.5 and D 6.3	See above
2.8) Need to develop methods to assess socio-economics effects on	See also recommendation 2.6. REFORM addresses socio-	D 5.2	See above

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
public, benefits, stakeholders, synergies with different directives and flood risk management	economic aspects in various WPs in particular in WP5.	D5.3 Effects of climate and land use changes on river ecosystems and restoration practices	Oct 2014
		D5.4 Risks and uncertainty of different restoration strategies and options analysis	April 2015
2.9) Need for a cost-effective method for river restoration monitoring, in terms of spatial and temporal scales and key indicators, when and where to assess them	The standard monitoring network of the WFD will not account sufficiently for monitoring of individual restoration measures. WP6 will filter the suite of methods and tools for their practical applicability in water management	D6.2	
2.10) Develop prioritization tools for river restoration measures, specially for morphological interventions	REFORM will not develop a prioritisation tool but will provide decision support on the selection of measures as well as information on their cost-effectiveness (WP6). Risk and uncertainties are addressed in WP5.	D1.4 Inventory of the cost of river degradation and the socio-economic aspects and costs and benefits	Oct 2013
		D 5.2, 5.4 and D 6.3	See above

Table 4 Issues related to Mediterranean rivers (WG3)

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
3.1) Inclusion of Mediterranean rivers across the REFORM project	The projects aims at producing results that are applicable across Europe and the consortium has four partners from Mediterranean countries. This will help guarantee that issues specifically relevant for this region are addressed throughout REFORM. Mediterranean rivers are in the project WIKI restoration database and, depending data availability, they will be represented by case studies in different work packages. E.g. they are used to test the ecohydromorphological assessment framework in WP2.	Cross-cutting. No deliverable in particular	
3.2) Development of guidance on the definition of environmental flows	The development of guidance on their definition and implementation is not a specific objective of REFORM. There is already an extensive literature on methodologies for the estimation of different types of environmental flows, and method reviews and analysis of their implementation in RBMPs are available and currently under discussion in the European Commission (see background information Blueprint to safeguard European waters)	The project board of REFORM will discuss together with its advisory board and the CIS ECOSTAT ad hoc working group on hydromorphology whether and how REFORM can contribute	October 2013
3.3) Taking into account the level of degradation of rivers when setting restoration objectives	REFORM will review methodologies for benchmarking and setting end-points for restoration projects and develop a protocol that addresses tuning of river restoration with other socio-economic uses (WP5). Targets or endpoints take account of the degradation level i.e. whether water bodies are natural or heavily modified and thus can only achieve a good ecological potential	D5.1 Review of methodologies for benchmarking and setting end-points for restoration projects	April 2013
		D5.2 Cost effective restoration measures that promote wider ecosystem and societal benefits	Apr 2014
		D5.3 Effects of climate and land use changes on river ecosystems and restoration practices	Oct 2014
3.4) Interaction between groundwater and surface water	Groundwater is a minor issue within REFORM and addressed in WP3 as separate aspect of river degradation with regard to the role of groundwater for environmental flows	D3.1 Impacts of hydromorphological degradation and disturbed sediment dynamics on ecological status	Oct 2013

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
	and in WP6 with regard to existing models.	D6.2 Methods, models, tools to assess the hydromorphology of rivers	Jul 2015
3.5) Relevance of hydromorphological quality elements for ecological assessment	REFORM aims at providing a framework for improving the success of hydromorphological restoration measures, and one of its specific objectives is to select WFD compliant hydromorphological indicators for cost-effective monitoring.	D2.2 Influence of natural hydromorphological dynamics on biota and ecosystem functioning	Jul 2014
		D3.3 Evaluation of candidate indicators for case studies including uncertainty	Oct 2014
		D4.3 Report on the results of the hydromorphological and ecological survey	Apr 2014
		D4.5 Fact sheets for restoration projects	Oct 2014
		D 6.2	July 2015
		D6.3 Guidelines and decision support for cost-effective river-floodplain restoration and its benefits	Oct 2015
3.6) Other actions	Apart from the direct recommendations and requests made to REFORM, the project will also cover other topics discussed in the working group, as is the case of all key pressures identified for Mediterranean rivers. Finally, REFORM aims at developing practical approaches on how to account for climate and also land use changes in the design of programmes of measures. The project will specifically address adaptation to change by using restoration measures to accommodate floods and droughts.	D 5.3	See above

Table 5 Issues related to "unraveling the impact of hydromorphological pressures in multiple-pressure settings" (WG4)

Recommendation /request	Addressed in REFORM?	Deliverable	Timing
Essential to address (Must do)			
4.1) Some data exists to help appraise the impact of catchment-driven processes and pressures. However, we need robust ways to confidently demonstrate success of measures	WP4 of REFORM addresses the effectiveness of restoration measures directly. WP5 develops a protocol to benchmark restoration success. The WIKI will contain descriptions of measures. This together results in guidelines for cost-effective restoration (WP6)	D4.2 Evaluation of hydromorphological restoration from existing data	Oct 2013
		D4.5 Fact sheets for restoration projects	Oct 2014
		D5.1 Review of methodologies for benchmarking and setting end-points for restoration projects	Apr 2013
		D6.3 Guidelines and decision support for cost-effective river-floodplain restoration and its benefits	Oct 2015
4.2) Derive the best suite of BQE based on their response to abiotic variables. Use targeted monitoring to refine existing metrics	REFORM tackles this point directly specifically in WP3. Posthoc calibration techniques to quantify sensitivity to derive new indicators of hydromorphological degradation. Quantify indicator / discrimination power of different BQEs with respect to different aspects of hydromorphological degradation. Experimental work rather than targeted monitoring will be used to refine metrics.	D3.1 Impacts of hydromorphological degradation and disturbed sediment dynamics on ecological status	Oct 2013
4.3) Hydromorphological data are lacking. Exploit existing data (DTM, satellite, monitoring) to characterise river networks at catchment/regional scale, then prioritise field campaigns to collect integrated fluvial geomorphological information over time	Scale dependent characterisation is being carried out in WP2. WP3 compiles existing data sets with strong gradients in hydromorphological degradation (hydrological regime, groundwater conditions and morphology), known levels of other pressures such as water quality, with co-located WFD BQE samples as well as existing sediment data sets for risk and pressure assessment. It will also suggest changes to methods needed to collect better integrated data.	D2.1 Multi-scale framework and indicators of hydromorphological processes and form	Oct 2014
		D 3.1	See above

Recommendation /request	Addressed in REFORM?	Deliverable	Timing
Desirable to address (Should do)			
4.4) Disentangling the effects of hydromorphological pressures will require compiling complex databases. These should include empirical and modelled data. Gradient and control-impact designs should be put in place to answer specific questions.	This series of stakeholder input focused on the importance of designed experiments and modelling work to disentangle multiple stressors. These are exactly the tools being used in WP3 to meet the stakeholders needs.	D 3.1	See above
		D3.2 Understanding biological responses to degraded hydromorphology sediment dynamics and multiple stress	Oct 2014
		D3.3 Evaluation of candidate indicators for case studies including uncertainty	Oct 2014
		D3.4 Guidance on how to identify impacts of hydromorphological degradation on riparian ecosystems	Oct 2014
4.5) Further research is needed to estimate the effects of pressures on BQE	See above (4.2 and 4.4)		
4.6) It may not always be necessary to fully disentangle synergistic effects. Where it is, however, rigorously designed and controlled (BACI) field studies, perhaps combined with appropriate models, offer the best chance of success.	See above (4.2 and 4.4)		
Informative (Could do)			

Recommendation /request	Addressed in REFORM?	Deliverable	Timing
4.7) Agriculture is considered a major determinant of river restoration success. How do we identify and prioritise which agricultural stressor to target?	REFORM will facilitate the application of existing models by helping to disentangle how multistressors interact and therefore which pressures need to be tackled. There is, however, no particular emphasis on agriculture.	D3.2	See above
4.8) What modelling tools are available to assess the effects of upstream & diffuse HYMO pressures on a specific reach / point?	WP6 compiles the overview of methods, tools and models. The WIKI has a specific section to describe the application of tools and models (http://wiki.reformrivers.eu/index.php/Category:Tools)	D6.2 Methods, models, tools to assess the hydromorphology of rivers	Jul 2015
4.9) We must try to ensure that there are no losers! Decision making should be transparent, consistent, involve socio-economic concerns (incl. compensating land owners loss) as well as hydromorphological decisions. Decisions should outline anticipated positive outcomes	WP5 addresses issues such as trade-offs, multiple benefits and synergies between various uses and environmental targets of rivers and floodplains. In WP2 a framework for ecosystem goods and services of rivers is developed.	D2.3 Framework to analyse ecosystem services provided by European river systems	Oct 2013
		D5.2 Cost effective restoration measures that promote wider ecosystem and societal benefits	Apr 2014
		D5.3 Effects of climate and land use changes on river ecosystems and restoration practices	Oct 2014

Table 6 Issues related to "designing the Programme of Measures" (WG5)

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
Essential to address (Must do)			
5.1) Water planners need tools to implement cost-effective PoMs. In general, costs can be estimated at the planning level with an acceptable degree of uncertainty. Tools for the estimation of effectiveness would be key in helping managers/planners to prioritize restoration actions, and would hopefully ensure consistency within RBDs and between different regions	WP6 is dedicated to translating scientific knowledge from the WP's 1 to 5 into practical tools compiling the overview of methods, tools and models. The WIKI has a specific section to describe the application of tools and models (http://wiki.reformrivers.eu/index.php/Category:Tools). Consistency within RBDs and between different regions is not a topic within REFORM, but the responsibility of member states with the support of ECOSTAT. Applying similar tools and standardizing approaches of course supports improving the consistency.	D1.4 Inventory of the cost of river degradation and the socio-economic aspects and costs and benefits	Oct 2013
		D6.2 Methods, models, tools to assess the hydromorphology of rivers	Jul 2015
		D6.3 Guidelines and decision support for cost-effective river-floodplain restoration and its benefits	Oct 2015
5.2) There is a need for both a long term vision on sustainable land and water use (beyond 2027) to trigger incremental transition and short- and mid-term no-regret measures. Native perspectives for users should be developed as supported by political commitments to act.	WP2 develops a process-based hydromorphological framework for rivers. When the role of processes and forms is acknowledged and taken into account in land and water management, this benefits sustainability. WP4 gives particular emphasis on restoration within the catchment context.	D2.1 Multi-scale framework and indicators of hydromorphological processes and forms	Oct 2014
		D2.2 Influence of natural hydromorphological dynamics on biota and ecosystem functioning	Jul 2014
		D4.5 Fact sheets for restoration projects	Oct 2014
5.3) There is a need to develop methods/guidelines to ensure that each intervention or group of interventions takes into account the timescales & spatial scale that are	WP2 addresses spatial and temporal scales of hydromorphological processes in rivers and floodplains. WP5 develops a protocol to assess the success of restoration including temporal aspects and develops tools for risk and uncertainty assessment of restoration strategies.	D2.1	See above
		D5.1 Review of methodologies for benchmarking and setting end-points for restoration	Apr 2013

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
appropriate for hydromorphological process responses to be restored. For example, expecting floodplain connection immediately after small dam removal does not take into account hydromorphological process responses and scales for channel morphology evolution.		projects	
		D5.4 Risks and uncertainty of different restoration strategies and options analysis	Apr 2015
Desirable to address (Should do)			
5.4) We need both simple tools to identify post provisioning restoration measures and complex tools for detailed analysis. Simple tools should be science-based but could contain expert judgement as well.	See 5.1. WP6 will give guidance on the applicability of methods, tools and methods including the range from rapid assessment towards detailed analysis.	D6.2, D6.3	See above
5.5) The WFD and Floods Directive should be integrated to develop plans that will reduce the flood risks and improve the ecological status	WP5 addresses issues such as trade-offs, multiple benefits and synergies between various uses and environmental targets of rivers and floodplains including flood protection	D5.2 Cost effective restoration measures that promote wider ecosystem and societal benefits	Apr 2014
		D5.3 Effects of climate and land use changes on river ecosystems and restoration practices	Oct 2014
5.6) We can estimate the effect of potential measures using expert-judgement next to calculations and modelling approaches, but there is a need to complete the outcomes with recommendations on monitoring.	These aspects are addressed in the WPs 4 to 6.	D4.5, D5.4, D6.2 and D6.3	See above
Informative (Could do)			
5.7) River basin authorities must involve and be responsive to a wide range of stakeholders in identifying measures (e.g. scientistsfic- to make sure they have scientific rigor, +	The results of the WPs 4 to 6 should support this. In particular also because results are made available in the open access WIKI linking know-how from case studies on river restoration to scientific knowledge on river functioning (http://wiki.reformrivers.eu).	D4.5, D5.1, D5.2, D5.3, D5.4, D6.1, D6.2 and D6.3	See above

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
stakeholders- so that they understand the benefits and their role in making it happen...education, citizens + and business). Political decisions i.e. final approved RBMPs should say why the final list of measures was selected (e.g. environmental, social, economical reasons) and be explicit.			

Table 7 Issues related to "heavily modified water bodies" (WG6)

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
Essential to address (Must do)			
6.1) Concrete practical guidance: a. Use-based "starting point" mitigation with information on effectiveness b. Which hydromorphological measures have ecological benefit in context of navigation and agriculture?	WP6 gives guidance and support to select restoration measures	D6.3 Guidelines and decision support for cost-effective river-floodplain restoration and its benefits	Oct 2015
c. How to deal with lobbies from users? How can ecosystem services help in this?	Ecosystem services are part of several REFORM WPs (2, 4 and 5). Within WP2 a coherent framework will be developed to link ecosystem services to hydromorphological status of rivers. The framework is applied within the case study catchments of WP4. WP5 addresses issues such as trade-offs, multiple benefits and synergies between various uses and environmental targets of rivers and floodplains including flood protection	D2.3 Framework to analyse ecosystem services provided by European river systems	Oct 2013
		D4.4 Report on the results of the socio-economic survey	Apr 2014
		D5.2 Cost effective restoration measures that promote wider ecosystem and societal benefits	Apr 2014
6.2) Understanding as a basis: a. Targets based on processes and the future, not just on what is feasible	Processes and forms are addressed in WP2, and benchmarking and target setting in WP5. REFORM, however, is a research project and does not make public or political choices	D2.1 Multi-scale framework and indicators of hydromorphological processes and forms	Oct 2014
		D5.1 Review of methodologies for benchmarking and setting end-points for restoration projects	Apr 2013
		D5.2	See above
b. Meaning of "significant adverse effect on use" (not the same as "any impact on use"	WP 5 addresses risks and uncertainties of restoration strategies including undesired side-effects on use.	D5.4 Risks and uncertainty of different restoration strategies and options analysis	Apr 2015

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
6.3) Use natural processes for mitigation	WP 5 addresses risks and uncertainties of restoration strategies including undesired side-effects on use. WP6 gives guidance and support to select restoration measures	D5.4, D6.3	See above
Desirable to address (Should do)			
6.4) Good definitions: a. What can be achieved and what cannot?	There are two levels to answer. In generic terms i.e. what can be expected from certain measures or in the actual catchment context. Restoration in the catchment context is a central issue in WP4	D4.5 Fact sheets for restoration projects	Oct 2014
b. Minimum criteria for HMWB conditions and possible GEP improvements	This issue is a topic for the ECOSTAT ad hoc working group on hydromorphology.	The project board of REFORM will discuss together with its advisory board and the CIS ad hoc working group on hydromorphology whether and how REFORM can contribute	
6.5) Good practice: Use hydromorphology to define GEP (commonly monitored, yet not used)	REFORM develops support for improvement of hydromorphological assessment in various WPs.	D1.1 Review on eco-hydromorphological methods	Oct 2012
		D2.1	See above
		D6.2 Methods, models, tools to assess the hydromorphology of rivers	Jul 2015
Involve experts in developing mitigation; Monitor; Adapt	All deliverables of REFORM will be online available and summarised in WIKI pages. This is the start for a online WIKI for restoration. This should support experts by giving access to relevant knowledge and actual restoration projects		
Informative (Could do)			
6.6) Restoration in urban environments: Limited possibilities, REFORM to provide guidance	Within WP4 specific attention will be given to restoration of urban rivers	D4.2 Evaluation of hydromorphological restoration from existing data	Oct 2013

Recommendation/request	Addressed in REFORM?	Deliverable	Timing
6.7) Clear regulations and definitions: a."Easier" Prague method vs WFD biological method for defining GEP: define a minimum for GEP?	This issue is a topic for the ECOSTAT ad hoc working group on hydromorphology. Results from REFORM can help to evaluate the impact of hydromorphological modifications and the potential benefits of restoration.	D1.2 Review on effects of pressures on hydromorphological variables and ecologically relevant processes	Feb 2013
		D1.3 Review on ecological responses to hydromorphological degradation and restoration	Feb 2013
		D3.1 Impacts of hydromorphological degradation and disturbed sediment dynamics on ecological status	Oct 2013
		D3.4 Guidance on how to identify impacts of hydromorphological degradation on riparian ecosystems	Oct 2014
b. HMWB designation varies per country. Yet reservoirs and flood protection are generally important	This issue is a topic for the ECOSTAT ad hoc working group on hydromorphology. WP5 of REFORM addresses issues such as trade-offs, multiple benefits and synergies between various uses and environmental targets of rivers and floodplains including flood protection.		
c. Proper definitions of HMWB, GEP and good ecological status (GES)	This issue is a topic for the ECOSTAT ad hoc working group on hydromorphology.		

7. Outlook

The REFORM stakeholder workshop provided a very good model of early two-way communication between an EU research project and water managers, especially those involved in the CIS ECOSTAT community. Several of the outputs of REFORM will be useful as direct input to work done on the CIS level. In the same time, the REFORM project will stay in close contact with the CIS ECOSTAT group to explore further synergies between their respective work programmes.

The REFORM workshop has been a good opportunity for the REFORM scientists to understand the needs of stakeholders. Participants in their turn supported this type of further interaction. Water managers should stay informed about the research developments in REFORM and the REFORM partnership should reach out to stakeholders to gain further information that is needed for the success of the project. The applied partners of the REFORM project (ISPRA, CEDEX, DLG, Environment Agency England & Wales) will assist the scientific teams in the development of tools which are useful to practitioners.

In the following months, the original work programme of REFORM may be adapted in certain aspects, on the basis of the 1st project periodic review and requests made to the project by stakeholders at the REFORM Stakeholder Workshop. The project board of REFORM will discuss together with all REFORM partners how resources can be made additionally available to add further items to the work programme.

In the same time, substantial effort will be made to make project information available in the REFORM WIKI (http://wiki.reformrivers.eu) in a way suitable for water managers to use. In addition, the REFORM partnership will continue to seek opportunities to secure the continuation of the WIKI after project end.

Finally, although it is not planned to organise a further stakeholder interactive workshop, the REFORM project will continue to inform and consult with the stakeholder community using an array of communication tools:

- Active interaction with relevant working groups of the Common Implementation Strategy of the WFD and involvement in expert groups set up by the European Commission to support the implementation of the WFD
- Bi-annual publication of the REFORM Newsletter (subscription under http://reformrivers.eu/home)
- Circulation of Policy Briefs
- Organisation of a Final Conference in 2015, with invitation to the stakeholder community.

Annex 1: Workshop Programme

Programme of REFORM Stakeholder Workshop on River Restoration to Support Effective Catchment Management (26 – 27 February 2013, Hotel Silken Berlaymont, Brussels)

	Day 1- Tuesday 26 February 2013	
09:30	Registration and welcome coffee	
	Session I: Towards effective river restoration in Europe **(Moderator: Tom Buijse, Deltares, & Peter Pollard, SEPA)**	
10:00	Welcome & introduction to REFORM	Tom Buijse, Deltares
10:15	EEA State of Water 2012: Hydromorphological alterations and pressures	Peter Kristensen, European Environment Agency
10:30	Challenges and bottlenecks for river restoration with reference to the 1st RBMPs	Christian Wolter, Leibniz-Institute of Freshwater Ecology and Inland Fisheries
10:45	Outcomes of ECOSTAT workshop on Hydromorphology, June 2012	Peter Pollard, SEPA
11:00	Hydromorphological assessment methods: Limitations and strengths	Massimo Rinaldi, Università di Firenze
11:15	Discussion	
11:30	Coffee Break	
12:00	Understanding the root causes of degradation and specifying the expected outcome of restoration	Nikolai Friberg, Aarhus University
12:15	Evidence of success of river restoration measures	Daniel Hering, University Duisburg-Essen
12:30	European multi-scale ecohydromorphological assessment framework	Angela Gurnell, Queen Mary, University of London
12:45	Discussion	
12:55	Introduction to parallel working groups	Eleftheria Kampa, Ecologic Institute
13:00	Lunch break	
	Session II: Parallel working groups	
14:00	**WG 1: Lowland rivers** *(Moderator Nikolai Friberg, Aarhus University, Rapporteur Wim Zeeman DLG)* Changing planform, meandering to straight, hardening river banks, deepening channels, sediments; agriculture, floods, navigation drivers **WG 2: Highland/midland rivers** *(Moderator Daniel Hering UDE, Massimo Rinaldi, UNIFI)* Hydropower, storage pressures, flow disruptions, break of continuity, sediments	

	Day 1- Tuesday 26 February 2013
	WG 3: Mediterranean rivers *(Moderator Martina Bussettini ISPRA, Rapporteur Marta Catalinas CEDEX)* River intermittency, flow seasonality, flow regulation (dams), water withdrawal (e.g. irrigation, power generation), sediment retention Goal description for parallel working groups 1-3: The goal is to allow for discussion among participants who share similar problems and potential solutions, in order to have more profound and to-the-point discussions. Mediterranean rivers are a separate group to give them ample attention and due to the different flow regimes.
16:00	Coffee break
	Session III: Parallel working groups (continued)
16:30	**WG 4: Unraveling the impact of hydromorphological pressures in multiple-pressure settings** *(Moderator Nikolai Friberg, Aarhus University, Rapporteur: Matthew T O'Hare, CEH)* **WG 5: Designing Programmes of Measures** *(Moderator Daniel Hering UDE, Tomasz Okruszko, WULS)* **WG 6: Heavily Modified Water Bodies** *(Moderator Martina Bussettini ISPRA, Rapporteur Erik Mosselman Deltares)* Goal description for parallel working groups 4-6: One group will deal with cause-effect issues (DPSIR in multistressor environments), another group will deal with scaling issues/programmes of measures for river basins and the last group will deal with target setting in highly modified environments (HMWBs)
18:30	End of day 1
18:30	Drinks at venue

	Day 2- Wednesday 27 February 2013	
	Session IV: Reports from working groups **(Moderator: Wouter van de Bund, JRC)**	
9:00	Reports from working groups	Rapporteurs of working groups
9:45	Discussion	
	Session V: Knowledge sharing on hydromorphological degradation and restoration (Moderator: Sergey Moroz, WWF)	
10:00	Commission update on hydromorphology issues	Claire McCamphill, DG Environment, EC
10:15	Knowledge sharing for the Water Framework Directive - Outcome and recommendations of SPI events	Yorick Reyjol, ONEMA
10:30	Knowledge sharing on hydromorphology – The REFORM WIKI	Erik Mosselman, Deltares
10:45	Coffee Break	
11:15	Life+RESTORE: Communicating best practice on river restoration in Europe	Toni Scarr, Environment Agency
11:30	Knowledge sharing: The role and strategy of ECOSTAT	Wouter van de Bund, JRC
11:45	Discussion *Topic: How to support knowledge sharing and transferability of know-how on hydromorphological degradation and restoration?*	
	Session VI: Workshop conclusions	
12:15	Conclusions & Next steps	Jointly REFORM & ECOSTAT
12:30	End of workshop	

Annex II: Workshop moderation methods

Silent discussion

The idea behind the moderation through silent discussion is that each person either poses a question or makes a statement (on key problems and open issues) in connection with the topic in the working group. People are arranged in subgroups of 6-8 persons. Once everybody is ready with their question or statement (or the time is elapsed) the sheet of paper is transferred to the person on the left. That person reads what is written and then writes his response to the question /statement of the 1st person. Such response can be of any nature: supporting, disagreeing, nuancing, specifying, rephrasing etc. After the time has elapsed it is again transferred to the left until it finally returns to the initial person. He reads all the comments and replies and then rephrases (when needed) his original question / statement.

Table 8 Form for silent discussion (A4 sheet)

Heading: What do you consider is the major issue (problem; open question) with regard to *mention the topic*
Name:
Either formulate a question or a statement to describe your issue
Reply 1
Reply 2
Reply ..
Reply 'n'
Rephrase your original question / statement based on the above comments

In this way we collect rephrased/improved questions / statements from each participant.

Pyramidal learning

Pyramidal learning is a prioritisation method to reach group consensus about fundamental issues.

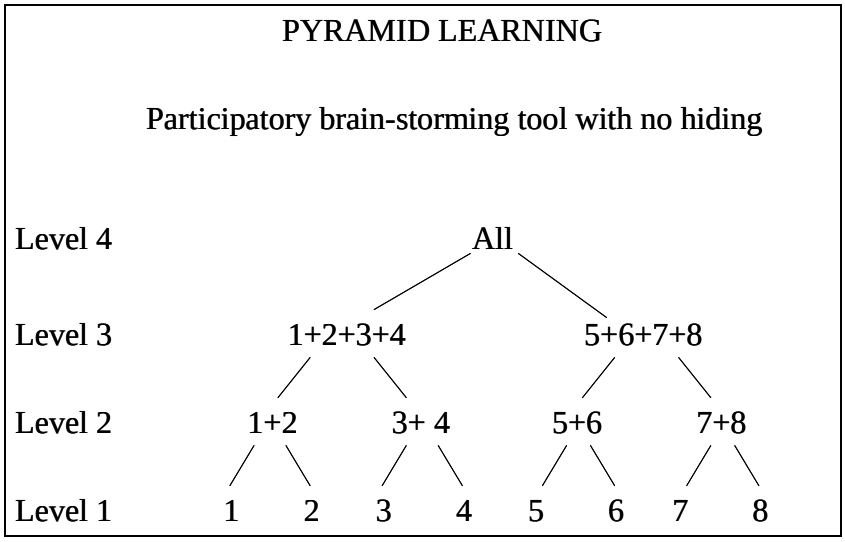


Figure 3 Pyramidal learning

- Divide the group into 4, more or less equal sized subgroups
- Each group either chooses "problems/open questions" or "recommendations / requests" as topic so that there are 2 subgroups for each.
- Appoint a chair per subgroup who will report.
- Level 1: Individually (each person) list the '5' most important issues or points associated with the theme or question relevant to your country or organisation in priority order (Note: these individual lists should be retained). Participants should preferably pick and choose issues from the issues raised in an earlier post-it inventory to identify what they consider important/relevant issues.
- Level 2: Discuss the points with your colleague and develop a joint list of '5' points in priority order. You must argue for the inclusion of points and their order of priority to ensure only the important issues progress.[1]
- Level 3: Repeat Level 2 but with 4 persons.
- Level 4: Repeat Level 2 but with 8 persons.
- Present the key findings (maximum 5 main issues or recommendations) and justification of priority order to everybody in the working group

The result is an overview of the important issues by each person and the consensus of the subgroups.

MoSCoW prioritization

The collection of questions / statements from each participant (e.g. through silent discussion) is followed by a prioritisation, using the MoSCoW approach.

- M - MUST: Describes an issue that must be addressed.

[1] In case the group size does not equal 8, but e.g. 6 or 9 then you can adjust the levels e.g. 1-3-9 or 1-3-6 to what is most convenient.

- S - SHOULD: Represents a high-priority item that should be included if possible. This is often a critical requirement but one which can be satisfied in other ways if strictly necessary.
- C - COULD: Describes a requirement which is considered desirable but not necessary. This will be included if time and resources permit.
- W - WON'T: Represents an issue that stakeholders have agreed will not be implemented, but may be considered for the future.

All the questions and statements are written on flip charts by the rapporteur or moderator (ca. 8 issues per flipchart). If time allows similar questions / statements could be grouped. Participants get the opportunity to read all the individual questions / statements. Each participant receives 12 stickers in 4 different colours, i.e. 3 for each category (M, S, C or W) to give high or less priority to each question / statement.
The outcome is subsequently discussed plenary.

Annex III: List of participants

Name	Surname	Organisation	Country
Evdokia	Achilleos	European Commission	Belgium
Maria Helena	Alves	Portuguese Environmental Agency	Portugal
Ingemar	Anderson	Swedish Agency for Marine & Water Management	Sweden
Erik	Ansink	VU University	The Netherlands
Mónica	Aparicio	Ministry of Agriculture, Food and Environment	Spain
Agnes	Barillier	Electricité de France (EDF)	France
José (Pepe)	Barquín	Environmental Hydraulics Institute (IH-Cantabria) / University of Cantabria	Spain
Egon	Bäumel	Amt der Steiermärkischen Landesregierung, Abteilung 14, Common representative of the Austrian Länder	Austria
Elina	Bennetsen	Ghent University	Belgium
Simone	Bizzi	Italian Centre for River Restoration (CIRF)	Italy
Phil	Boon	Scottish Natural Heritage	UK
Karel	Brabec	Masaryk University	Czech Republic
Chris	Bromley	Scottish Environment Protection Agency	United Kingdom
Jan	Brooke	PIANC	UK
Paul	Brotherton	Wetlands International	Netherlands
Tom	Buijse	Deltares	The Netherlands
Martina	Bussettini	National Institute for Environmental protection and research	Italy
Marta	Catalinas	Centre for Hydrographic Studies (CEDEX)	Spain
Daniël	Coenen	Local water authorities Brabantse Delta	the Netherlands
Ian	Cowx	University of Hull	UK
Huib	de Vriend	Deltares	The Netherlands
Michael	Detering	RWE Innogy	Germany
Petra	Djuric	State Institute for Nature Protection	Croatia
Alain	Dohet	CRP - Gabriel Lippmann	Luxembourg
Harm	Duel	Deltares	The Netherlands
Michael	Dunbar	Environment Agency	UK
Frauke	Ecke	Swedish University of Agricultural Sciences	Sweden
Judy	England	Environment Agency	UK
Bart	Fokkens	European Centre for River Restoration (ECRR)	The Netherlands
Christos	Fragakis	European Commission	Belgium

Name	Surname	Organisation	Country
Nikolai	Friberg	Aarhus University	Denmark
Wim	Gabriels	Flemish Environment Agency (VMM)	Belgium
Diego	Garcia de Jalon	Technical University of Madrid (UPM)	Spain
Holger	Gerdes	Ecologic Institute	Germany
Andrea	Goltara	Italian Centre for River Restoration (CIRF)	Italy
Marta	Gonzalez de Tanago	Technical University of Madrid (UPM)	Spain
Robert	Grabowski	Queen Mary, University of London	UK
Przemyslaw	Gruszecki	Chief Inspectorate for Environmental Protection	Polish
Angela	Gurnell	Queen Mary, University of London	UK
Daniel	Hering	University of Duisburg-Essen	Germany
Katarina	Holubova	Water Research Institute	Slovakia
Stijn	Huysecom	Ghent University	Belgium
Anders	Iversen	Norwegian Directorate for Nature Management	Norway
Martin	Janes	River Restoration Centre	UK
Arne	Johlander	Swedish Agency for Marine & Water Management	Sweden
Niall	Jones	Environment Agency	UK
Graziella	Jula	National Administration "Romanian Waters"	Romania
Oliver	Jung	European Small Hydropower Association	Belgium
Eleftheria	Kampa	Ecologic Institute	Germany
Christine	Keulen	Walloon Ministry	Belgium (Wallonia)
James J	King	Inland Fisheries Ireland	Republic of Ireland
Johan	Kling	Swedish Agency for Marine and Water Management	Sweden
Julia	Kraml	University of Natural Resources and Life Sciences, BOKU	Austria
Peter	Kristensen	European Environment Agency	Denmark
Mario	Lepage	National Research Institute of Science and Technology for Environment and Agriculture (IRSTEA)	France
Antonio	Lo Porto	Water Research Institute (IRSA-CNR)	Italy
Jean-rené	Malavoi	Electricité de France (EDF)	France
Suneet	Manjavkar	UNESCO-IHE	The Netherlands
Jenny	Mant	River Restoration Centre	UK
Stefano	Mariani	Institute for Environmental Protection and Research (ISPRA)	Italy
Peter	Mayr	University of Natural Resources and Life Sciences, BOKU	Austria
Chiara	Mazzetti	Ecologic Institute	Germany
Claire	Mccamphill	European Commission	BELGIUM

Name	Surname	Organisation	Country
Johanna	Mesquita	French Water Agency (AESN)	France
Emilia	Mišikova Elexova	Water Research Institute	Slovak Republic
Martina	Mlinaric	The European Environmental Bureau (EEB)	Belgium
Marta	Moren Abat	European Commission	Belgium
Sergiy	Moroz	WWF	Belgium
Erik	Mosselman	Deltares	The Netherlands
Helena	Muehlmann	Federal Ministry of Agriculture, Forestry, Environment and Water Management	Austria
Denisa	Němejcová	T.G. Masaryk Water Research Institution, p.r.i.	Czech Republic
Gisela	Ofenboeck	Federal Ministry for Agriculture, Forestry, Environment and Water Management	Austria
Matthew	O'Hare	Centre for Ecology and Hydrology (CEH)	UK
Tomasz	Okruszko	Warsaw University of Life Sciences	Poland
Libuse	Opatrilova	Water Research Institute, p.r.i.	Czech Republic
Piotr	Panek	Chief Inspectorate for Environmental Protection	Poland
Alexandre	Peeters	University of Liège	Belgium
Josée	Peress	French National Agency for Water and Aquatic Environments (ONEMA)	France
Peter	Pollard	Scottish Environment Protection Agency	UK
Felicia	Popovici	National Administration "Romanian Waters"	Romania
Yves	Reder	Administration of water management in Luxembourg	Luxembourg
Bart	Reeze	Regional Water Authority Groot Salland	The Netherlands
Rene	Reisner	Ministry of the Environment	Estonia
Yorick	Reyjol	French National Agency for Water and Aquatic Environments (ONEMA)	France
Massimo	Rinaldi	University of Florence	Italy
Irina	Roman	National Institute of Hydrology and Water Management	Romania
Leo	Santbergen	Brabantse Delta Water Management Authority	The Netherlands
Toni	Scarr	Environment Agency	UK
Gérard	Schmidt	CRP - Gabriel Lippmann	Luxembourg
Margriet	Schoor	Rijkswaterstaat	The Netherlands
Deborah	Slawson	National Research Institute of Science and Technology for Environment and Agriculture (IRSTEA)	France
Katerina	Smerousova	Ministry of the Environment of the Czech Republic	Czech Republic
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