


Why designing and implementing Natural Water Retention Measures?



Delivering multiple benefits
and contributing to the
co-achievement of
EU policy objectives

Natural Water Retention Measures are multi-functional measures that aim to protect water resources and address water-related challenges by restoring or maintaining ecosystems as well as natural features and characteristics of water bodies using natural means and processes.

Why have Natural Water Retention Measures (NWRM) emerged in European water policy making?

➤ **Societal needs and environmental awareness are wider nowadays**

Europe has progressively developed a wide policy framework for addressing environmental & societal concerns in the field of water. Key policies include *inter alia*:

WFD



The Water Framework Directive

legislation

Birds/habitats

The Birds & Habitats Directive



Floods



The Floods Directive

Climate change



EU strategy on adaptation to Climate Change

Strategies

EU strategy on Green Infrastructure (GI)



EU strategy on Biodiversity

Others

Urban development

Citizens have also higher demands for ecosystem services & amenities, especially in densely populated urban areas.



- **Room for Nature and 'soft measures' are gaining momentum to make policy operational**

Progressively, grey infrastructures used to deliver water services and reduce flood risks (dykes, dams, etc.) are being replaced by “softer measures” and green infrastructures emulating and preserving natural processes.

- **Making best use of scarce financial resources has become a driver to policy making**

With the financial & economic crisis, the need to make best use of available financial resources has emerged as priority policy principle shared by private operators and public bodies. Assessment frameworks such as cost-effectiveness or cost-benefit analyses are becoming more common to guide policy decisions; options that can simultaneously achieve several policy objectives and obligations are seen in a very favorable light.

What are NWRM?

➤ **NWRM official and complete definition:**

Natural Water Retention Measures are **multi-functional measures** that aim to protect water resources and address water-related challenges by restoring or maintaining **ecosystems** as well as **natural features and characteristics** of water bodies using **natural means and processes**.

The main focus of applying NWRM is to enhance the **retention capacity** of aquifers, soil, and aquatic and water dependent **ecosystems** with a view to improve their **status**.

The application of NWRM supports green infrastructure, improves the **quantitative status** of water bodies as such, and **reduces the vulnerability** to floods and droughts. It positively affects the **chemical and ecological status** of water bodies by restoring **natural functioning** of ecosystems and the services they provide. The restored ecosystems contribute both to **climate change adaptation and mitigation**.

➤ **In practice, NWRM entail a wide range of measures...**

Type	Class	NWRM Measure
Direct modification in ecosystems	Rivers and connected wetlands	Restoration and maintenance of rivers, basins, ponds, and wetlands; floodplain reconnection and restoration, reconnection of hydraulic annexes, elimination of riverbank protection...
	Lakes and connected wetlands	Restoration of lakes
	Aquifers	Aquifer restoration
Change & adaptation in land-use & water management practices	Agriculture	Restoring and maintaining meadows and pastures, buffer strips and shelter belts, soil conservation practices (crop rotation, intercropping, conservation tillage...), green cover, mulching...
	Forestry and pastures	Afforestation of headwater areas/mountainous areas/reservoir catchments, targeted planting for “catching” precipitation, land-use conversion for water quality improvements, continuous cover forestry, maintenance of riparian buffers, appropriate design of roads and stream crossing, urban forests...
	Urban development	Green Roofs, rainwater harvesting, permeable paving, SuDS: swales, soakaways, infiltration trenches, rain gardens, detention basins, retention ponds, urban channel restoration...

➤ ...divided into 4 sectors:

Agriculture



Urban



Forest



Hydro Morphology



➤ **Examples (with some benefits: complete list on the [catalogue](#)):**

Intercropping (Agriculture)



Benefits: slow runoff, increase infiltration, reduce erosion, filtrate pollution, reduce flood risks, protect ecosystems...

Green roof (Urban)



Benefits: slow and store runoff, Increase evapotranspiration, climate change adaptation and mitigation, flood risk reduction, aesthetic and cultural value...

Land use conversion (Forestry)



Benefits: slow and store runoff, Increase evapotranspiration, increase infiltration, reduce pollutant sources, intercept pollution, reduce erosion...

Re-meandering (Hydro-Morphology)



Benefits: slow river water, intercept pollution, reduce erosion, create aquatic and riparian habitat, natural biomass production, biodiversity preservation...

➤ Are NWRM new?

No! Many measures classified as NWRM already exist and are widely implemented as part of different sector plans & strategies.

You might recognise some of them here, for example:



<http://www.ecrr.org/>



<http://www.susdrain.org/>



http://ec.europa.eu/environment/nature/ecosystems/index_en.htm

What changes is the way we look at them, focusing on “retention” and on the multiple benefits these measures can deliver – and not on a single objective as was often done in the past.

Why choosing NWRM?

What are their potential benefits?

- **By adapting the retention capacity of soil and water ecosystems, NWRM can deliver different ecosystem services**
- **They can also contribute to the achievement of different policy goals**
- **Are NWRM cost-effective solutions?**

YES

The village of Belford, downstream, had a history of flooding. The costs of conventional flood defence improvements have been estimated at around 3 M€. In contrast, upstream NWRMs were estimated to deliver the same level of flood protection at a cost below 0.25 M€.

NO

When land costs are significant in particular in peri-urban areas, then reducing flood risk by giving more space to rivers can be less cost-effective than with more traditional measures but this depends on a case-by-case basis as examples with land purchased and NWRM implemented close to urban areas exist.

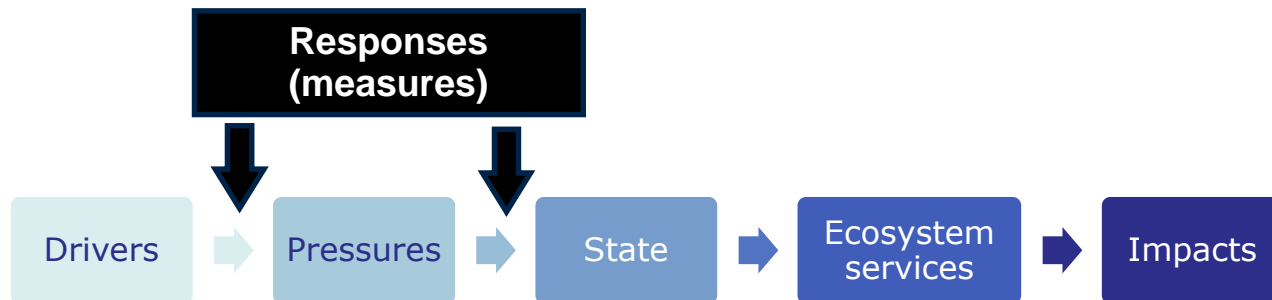
➤ **However, NWRM expected impacts and cost-effectiveness depend on:**

- **The biophysical and socio-economic conditions of your catchment**
- **Where you implement the measures**
- **Your project's scale (how many hectares or green roofs)**
- **With which combination of measures (possibly including conventional infrastructures)**
- **Whether you account for multiple functions and objectives simultaneously in your measure assessment framework**

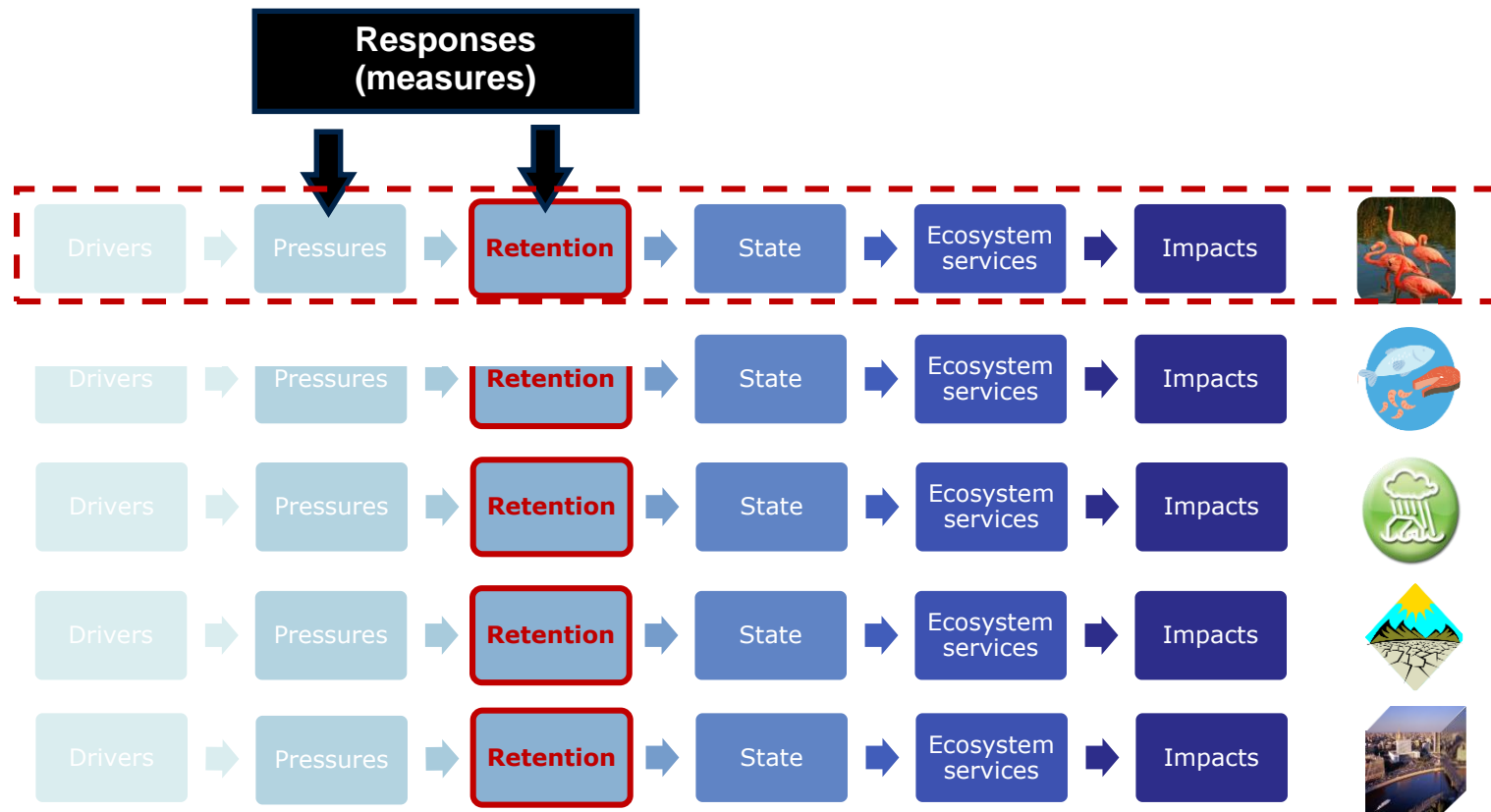
What are the pre-conditions for supporting cost-effective NWRM?

➤ *Issue 1 - We need better knowledge*

Knowledge we need for designing measures relates to Drivers, Pressures, State, Ecosystem Services delivered and impacts.



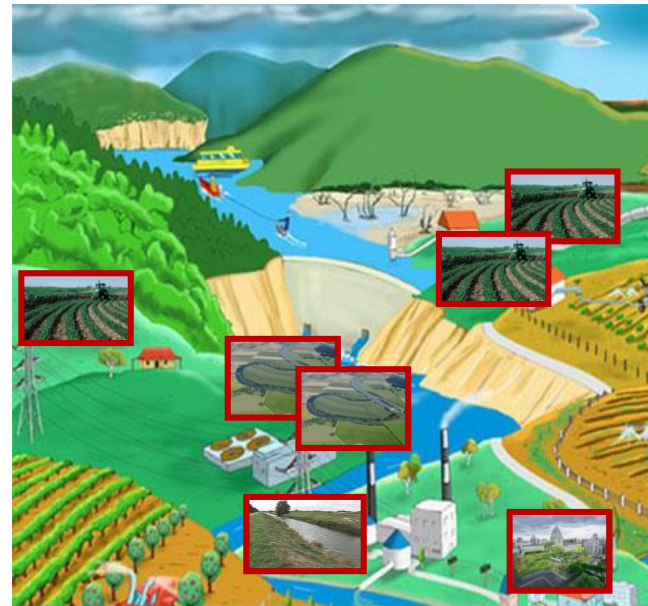
With NWRM, we need additional knowledge on retention, and on potential impacts of individual measures on a wide range of ecosystem services and policy objectives



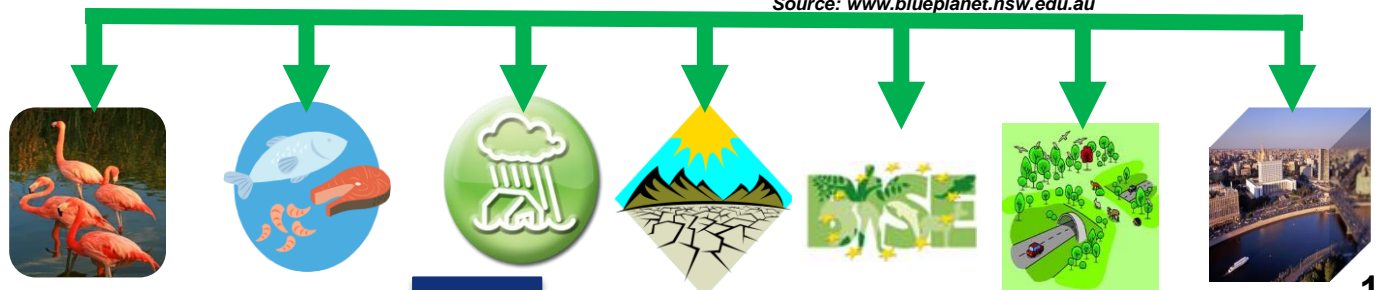
➤ *Issue 2 - We need to have water & land catchment planning truly operational...*

Catchment-scale spatial planning is essential for identifying the most appropriate locations for NWRM in combination with other measures ...

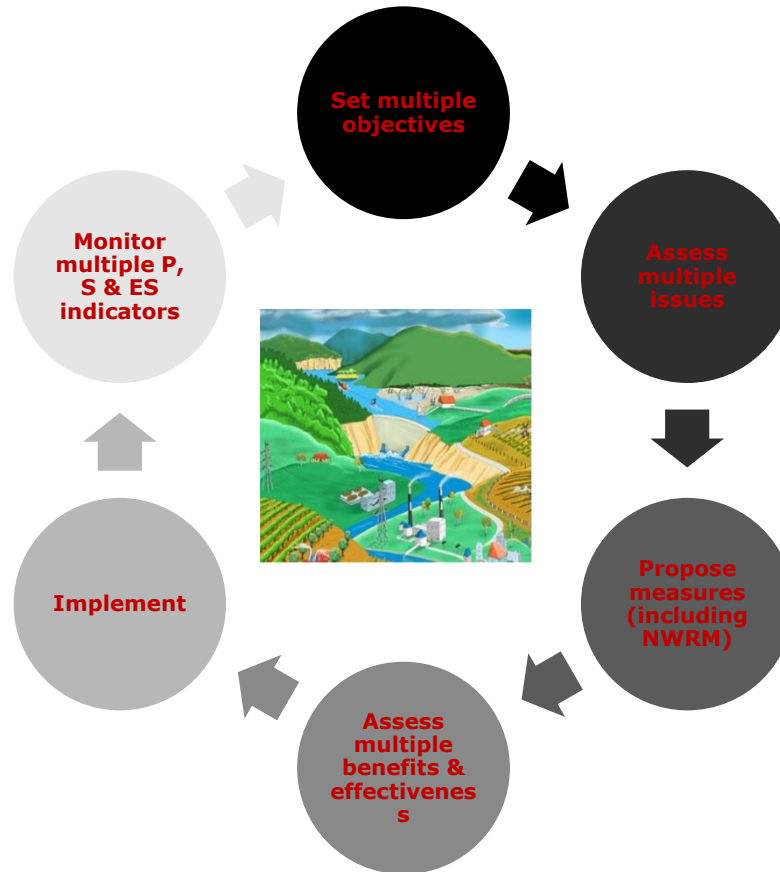
... so they contribute to multiple policy objectives.



Source: www.blueplanet.nsw.edu.au



... So it considers multiple objectives and benefits at each step of the planning process



➤ ***Issue 3 – We need the right governance***

- **Not limited to water users but involving catchment land & water stakeholders**
- **With mechanisms for enhancing synergies between multi-policy (decision making) processes, in particular for selecting measures based on multiple benefits**
- **And an active “Integrated” (territorial) information, communication & awareness raising that addresses multiple benefits and policy objectives**

➤ ***Issue 4 - We need to design the right “integrated” financing***

- **Opportunities to fund NWRM exist in all EU financing instruments !** Common Agriculture Policy and Rural Development Plans, structural & cohesion funds, LIFE and Horizon 2020.
- **But look for the right combination of funding sources – public and private – that correspond to the multiple benefits delivered.** Payments for Ecosystem Services, product labelling and certification, bio-carbon markets or biodiversity compensation funds...

➤ *Funding opportunities (examples)*

EU Financing instruments	
LIFE	Restoration projects (rivers, wetlands, forests...) Implementation of RBMPs and FRMPs.
European Structural and Investment Funds	Ecosystem restoration, climate adaptation, on-farm measures (buffer strips, wetland restoration, etc.)
EIB loans – Natural Capital Financing Facility	Nature based solutions such as NWRM for the prevention of floods

Emerging Financing instruments	
Payment for ecosystem services	Large NWRM projects at the catchment scale
Water funds	Large water management projects
Bio-carbon markets – Labelling and certification	Complementary funding

➔ When implementing NWRM, all available funding opportunities should be considered, to find the most suitable combination

If you need support and sources of inspiration, you can look at:

- The EC NWRM policy document, that can help you to advocate for NWRM to your decision makers and financing bodies



Synthesis documents

- The practical guide, that will give you tips for the design and implementation of NWRM



Practical guide

- The NWRM knowledge base, that:

1. Summarises evidence on the (potential) environmental, social and economic impacts of a wide range of NWRMs
2. Present real-life applications of NWRMs throughout Europe
3. Define the core terms



Catalogue of NWRMs

Case studies

Glossary

For more information on NWRM and related EC policy initiatives

- To contact
Lucia Bernal
WFD – Planning and measures
European Commission
DG Environment
Unit C1 – Water
Env-water@ec.europa.eu