

Flood risk reduction by PReserving and restOring river FLOODPLAINS

PRO_Floodplain

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River floodplains play a central role in integrated flood risk management. They contribute significantly to the **reduction of peak flows** and to the **prolongation of flood wave translation** not only for a certain design discharge (like structural measures) but also for higher discharges. Furthermore they fulfil other important functions like serving as sediment buffers or improving local hydraulic conditions. It can be noted that **non-technical solutions** (e.g. dike-shifting) obtain more natural and thus better developments.

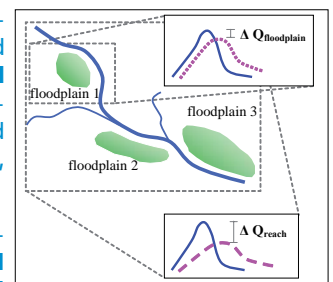


Study reaches in Austria, Germany and France.

Both, **preserving** as well as **restoring** of river floodplains represent an **environmentally compatible** and **cost effective** flood protection. There also exists a background regarding the environmental laws (European Union Water Framework Directive, European Union Floods Directive); with the protection and the restoration of floodplains for flood risk reduction the countries can fulfil parallel national and international targets for **environmental and nature protection**.

The overall aim of PRO_Floodplain was to develop the interdisciplinary **Floodplain Evaluation Matrix FEM**, an interdisciplinary method for evaluating various floodplains with respect to **hydromorphology, ecology and sociology**, leading to a priority ranking within a river catchment or river reach.

Thereby, representative parameters have been chosen based on varying criteria in **several study reaches** in the catchment areas of the Danube and the Rhine River in **Austria, Germany and France**.



Evaluation of peak reduction/peak increase.

The FEM priority ranking indicates **where non-structural measures are most powerful** and where effort should be spent first. The FEM procedure does not state, that floodplains with low priority are not important (have no value) or can be used otherwise than for flood risk management. Such floodplains still have great values e.g. for hydraulic purposes and higher risks (e.g. **climate change**).

The applied concept of the Floodplain Evaluation Matrix possesses a **pilot character**; it's a first step to approach the theme **„suitability of areas for uncontrolled flood retention by restoring river floodplains“**. The conception points out the fact, that **flood and floodplain management** can accompany. If the last remaining inundation areas are not preserved and where possible restored, both **flood risk management** and **ecology** will reach limits and thus restrict future sustainable developments of **society**.

Hydromorphology*	floodplain 1			floodplain 2			floodplain 3			Ecology	floodplain 1			floodplain 2			floodplain 3			Sociology**	floodplain 1			floodplain 2			floodplain 3		
	5	3	1	5	3	1	5	3	1		5	3	1	5	3	1	5	3	1		5	3	1	5	3	1	5	3	1
Peak reduction	5	5	1	5	3	1	5	3	1	Adapted land use	5	3	1	Type of usage	3	3	3	5	5	5	5	5	1	3	3	3	5	5	5
Flood wave translation	5	3	1	5	3	1	5	3	1	Dynamics of the water level	5	3	1	Channel of communication	3	3	3	5	5	5	5	5	1	3	3	3	5	5	5
River-kilometre parameters	5	5	1	5	3	1	5	3	1	Flow velocity	5	3	1																
Secondary effects ¹⁾	5	5	3	5	3	3	5	3	1	Surface relief	3	3	1																
Other processes	5	3	1	5	3	1	5	3	1	Connectivity of water bodies	5	1	1																
										Potential for development ²⁾	5	5	3																
										Endangering of habitats	5	5	1																
Hydromorphology total	5	5	1	5	3	1	5	3	1	Ecology total	5	3	1	Sociology total	3	3	3	5	5	5	3	3	3	5	5	5			

*¹⁾ not including hydraulic considerations which are important anyway (incorporation within FEM+)
**²⁾ not including economical considerations which are important anyway (incorporation within FEM+)
¹⁾ Secondary effects in case of discharges larger than design discharge
²⁾ Potential for development of typical habitats

Legend:
5 top priority
3 medium priority
1 low priority

	Hydromorphology total	Ecology total	Sociology total
floodplain 1	5	5	3
floodplain 2	5	3	3
floodplain 3	1	1	5

Outcome: The Interdisciplinary Floodplain Evaluation Matrix (FEM).



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