European Commission

NWRM

Natural Water Retention Measures

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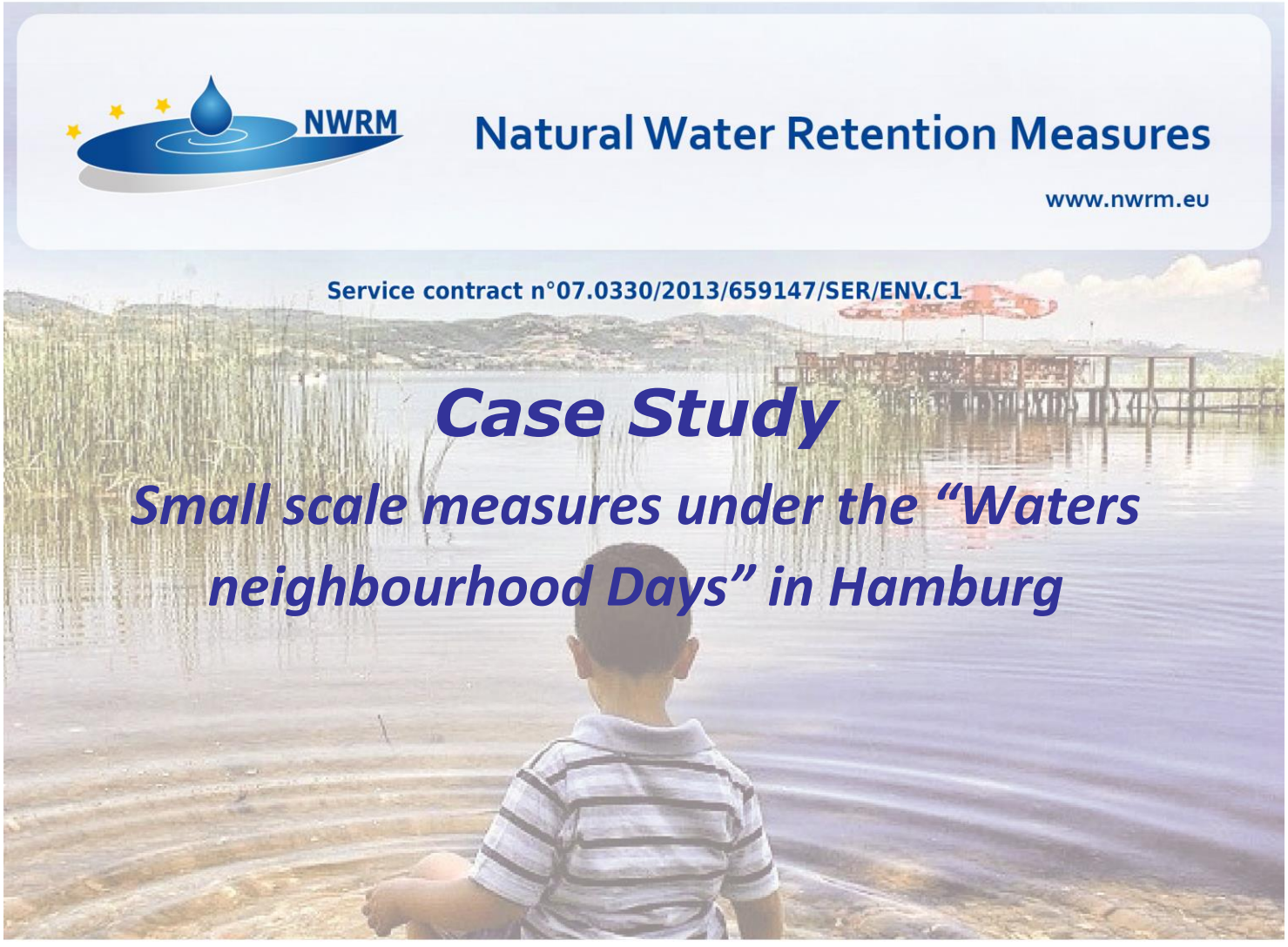

Case Study

Small scale measures under the "Waters neighbourhood Days" in Hamburg

ACTeon environment research & consultancy

Office International de l'Eau

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BEF LATVIA

enveco Environmental Economics Consultancy

I.A.CO Ltd Environmental & Water Consultants

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This report was prepared by the NWRM project, led by Office International de l'Eau (OIEau), in consortium with Actéon Environment (France), AMEC Foster Wheeler (United Kingdom), BEF (Baltic States), ENVECO (Sweden), IACO (Cyprus/Greece), IMDEA Water (Spain), REC (Hungary/Central & Eastern Europe), REKK inc. (Hungary), SLU (Sweden) and SRUC (UK) under contract 07.0330/2013/659147/SER/ENV.C1 for the Directorate-General for Environment of the European Commission. The information and views set out in this report represent NWRM project's views on the subject matter and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this report. Neither the Commission nor any person acting on the Commission's behalf may be held Key words: Biophysical impact, runoff, water retention, effectiveness - Please consult the NWRM glossary for more information.

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http://www.nwrm.eu

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I. Basic Information

Application IDWa	*Germany_02*			
Application Name	**Small scale measures under the "Waters neighborhood Days" in Hamburg**			
Application Location	Country:	Germany	Country 2:	
	NUTS2 Code		*DE60*	
	River Basin District Code		*Y*	
	WFD Water Body Code			
	Description		*The Osterbek river is an inflow of the river Alster in Hamburg. The studied river section is approximately 220 m long and located in a green corridor between allotments, roads and subway tunnels. The left side adjacent park area is a regularly mowed lawn, which also serves as an emergency overflow for a culvert of the Osterbek river. The Copse is light on both sides of the river.* *The middle Bille is part of the water system Bille, which flows into the Elbe river. The considered 150 m long section is located in a green belt. Left-sided runs a water-bound walk, on the right side residential blocks and a park are located at different distances.*	
Application Site Coordinates	Latitude:		Longitude:	
Target Sector(s)	Primary:	Hydromorphology		
	Secondary:	Urban		
Implemented NWRM(s)	Measure #1:	*N10*		
	Measure #2:	*N5*		
	Measure #3:	*N1*		
	Measure #4:	*U5*		
Application short description	The core of the activities carried out on Osterbek river was the installation of flow control arms at mean water level. Due to the width of the bundle of sticks of 2 to 2.5 m, they should contribute to a significant narrowing of the broad streambed. They were attached to three pegs that were fixed at the ground. In order to avoid under- or backflushing, the brushwood were strengthened with stones, coarse and fine gravel. A total of 14 flow control arms were installed at equal distances approximately transverse to the direction of flow on the left and right bank. In a wide section an island of gravel and coarse of about 15 m was applied. Also in the Middle Bille flow control arms were installed consisting of dead wood, stones and gravel. The brushwood was shortened to a length of about 1 m and transversely and with a slight tilt attached to two pegs in the sole. The height of the installment was also based on mean water level			

II. Policy context and design targets

Brief description of the problem to be tackled	The basin of the Osterbek river was expanded very widely over the past decades and thereby lost its natural structure. The increased runoff after rain and corresponding management led to a domination of sand in the river bed. Gravel, stones and dead wood are largely absent, so suitable conditions for animal and plant communities are absent. Due to anthropogenic interventions in the 19th Century the middle Bille was cut off from their natural course. Since then, it is supplied by the Kamp-Bille. In addition rain water flows into it from an outlet from a heavy frequented street. Due to the highly variable runoff and the narrow, deeply incised river bed with a partially still existing bank stabilization with Bongossi timber, it is a poorly structured river bed that offers no suitable conditions for most animal and plant communities. The proportion of sand is very high, stones and dead wood only occur sporadically.		
What were the primary & secondary targets when designing this application?	Primary target #1:	Biodiversity and gene-pool conservation in riparian areas	
	Primary target #2:	Soil formation and maintenance	
	Secondary target #1:	Mass stabilisation and control of erosion rates	
	Remarks		
Which specific types of pressures did you aim at mitigating?	Pressure #1:	WFD identified pressure	*2.1 Diffuse - Urban run off*
	Pressure #2:	Other non EU-Directive (specify)	
	Remarks		
Which specific types of adverse impacts did you aim at mitigating?	Impact #1:	WFD identified impact	*Nutrient pollution*
	Impact #2:	Floods Directive identified impact	*Community*
	Remarks		
Which EU requirements and EU Directives were aimed at being addressed?	Requirement #1:	WFD-achievement of good ecological status	*Habitat restoration for plants and animals*
	Remarks		
Which national and/or regional policy challenges and/or requirements aimed to be addressed?	National Biodiversity Strategy		

III. Site characteristics

Dominant Land Use type(s) *Select from the drop-down menu with the CORINE LU types and codes. Space of additional comments/remarks is provided*	Dominant land use	*111*
	Secondary land use	
	Other important land use	
	Remarks	
Climate zone	cool temperate moist	
Soil type	*N.A.*	

Average Slope	moderately steep (15-30%)	
Mean Annual Rainfall	600 - 900 mm	
Mean Annual Runoff	150 - 300 mm	
Average Runoff coefficient (or % imperviousness on site)		
	N.A.	
Characterization of water quality status (prior to the implementation of the NWRMs)	N.A.	
Comment on any specific site characteristic that influences the effectiveness of the applied NWRM(s) in a positive or negative way	Via a Form, which is available for download under www.NABU-Hamburg.de/wasser, the interested public can contribute their own proposals for local measures. The proposed measures for the two river sections were developed with the technical assistance of the NABU experts for water protection.	
	Negative way:	

IV. Design & implementation parameters

Project scale	Small (e.g. farm, plot, building complex, block)		
Time frame	Date of installation/construction		*09.2006*
	Expected average lifespan (life expectancy) of the application in years		*2*
Responsible authority and other stakeholders involved	*Name of responsible authority/ stakeholder*		*Role, responsibilities*
	1. NABU Hamburg e.V.		Initiation, implementation
	2.		
	3.		
	4.		
	5.		
The application was initiated and financed by	NABU Hamburg (Nature Conservation NGO)		
What were specific principles that were followed in the design of this application?	Low costs, functionality, adaptability		
Area (ha)	Number of hectares treated by the NWRM(s).		2 River sections (220m, 190m)
	Text to specify		
Design capacity	Unknown		
Reference to existing engineering standards, guidelines and manuals that have been used during the design phase	*Reference*		*URL*
	1.		
	2.		
	3.		

	4.		
	5.		
Main factors and/or constraints that influenced the selection and design of the NWRM(s) in this application?	The waters neighborhood days were initiated in 2005 by the Project Manager group for water protection at NABU Hamburg. Guided by their own vision to actively improve the water body structure of streams in Hamburg, also in times of scarce public resources, this particular collaboration was launched. It consisted of the project managers, NABU Hamburg, volunteers, Rückenwind e.V. and the competent district office (civil division).		

V. Biophysical impacts

Impact category (short name) Select from the **drop-down menu** below:	**No quantitative information on the biophysical impacts of this measure was collected, due to its small scale.**	**Impact quantification** (specifying units)	
		Parameter value; units	% change in parameter value as compared to the state prior to the implementation of the NWRM(s)
Runoff attenuation / control			
Peak flow rate reduction			
Impact on groundwater			
Impact on soil moisture and soil storage capacity			
Restoring hydraulic connection			
Water quality Improvements			
WFD Ecological Status and objectives			
Reducing flood risks (Floods Directive)			
Mitigation of other biophysical impacts in relation to other EU Directives (e.g. Habitats, UWWT, etc.)			
Soil Quality Improvements			
Other			

VI. Socio-Economic Information

What are the benefits and co-benefits of NWRMs in this application?	The main objective for both streams was the optimization of the water body structure by the installation of flow control arms. As a result, a variability of flow velocities in low and medium water levels was achieved. It led to both depressions and aggradations in the river bed as well as a sorting of different sediment fractions. The flow diverter in the

	river bed serves numerous aquatic organisms as a resting place or shelter during flood events. In them a layer of organic materials is accumulated which serves as a food source. As a result, a certain momentum within the current sole is created, whereby a low-water channel and shallow water zones should form over time.		
Financial costs	***Total:***	*Value in €*	*1270*
	Capital:	*Value in €*	*0*
	Land acquisition and value:	*Value in €*	*0*
	Operational:	*Value in €*	*1270*
	Maintenance:	*Value in €*	*0*
	Other:	*Value in €*	*0*
Were financial compensations required? What amount?	*Was financial compensation required: No*		
	Total amount of money paid (in €):		
	Compensation schema:		
	Comments / Remarks:		
Economic costs	*Actual income loss: None*		
	Additional costs:		
	Other opportunity costs:		
	Comments / Remarks:		
Which link can be made to the ecosystem services approach?	Links can be made to recreation, biomass production, and habitat protection.		

VII. Monitoring & maintenance requirements

Monitoring requirements	A professionally sound monitoring by the NABU is not possible with these small projects.
Maintenance requirements	The application has to be regularly monitored and maintained due to the use of only natural materials.
What are the administrative costs?	N.A.

VIII. Performance metrics and assessment criteria

Which assessment methods and practices are used for assessing the biophysical impacts?	None
Which methods are used to assess costs, benefits and cost-effectiveness of measures?	None

How cost-effective are NWRM's compared to "traditional / structural" measures?	They are assumed to be highly cost-effective, although no quantitative assessment was carried out for this application.
How do (if applicable) specific basin characteristics influence the effectiveness of measures?	N.A.
What is the standard time delay for measuring the effects of the measures?	N.A.

IX. Main risks, implications, enabling factors and preconditions

What were the main implementation barriers?	There were no implementation barriers, because of the small scale of the measure.
What were the main enabling and success factors?	Through the volunteer work of the project as well as the numerous helpers on the one hand and the charitable work of young people on the other hand no additional costs incurred.
Financing	1.270 EUR from the district authority.
Flexibility & Adaptability	The current implementation is highly flexible and adaptable to changing baseline conditions. The costs are generally low.
Transferability	Necessary preconditions are volunteered work and an effective cooperation with local authorities.

X. Lessons learned

Key lessons	After the first flood events it is visible that the water body structure at the Middle Bille has been significantly improved. Due to different flow speeds and variability of the basin structure a positive short to medium term impact on biodiversity can be assumed.

XI. References

Source Type	*Website*		
Source Author(s)	Michael Bender, Tobias Schäfer, Sebastian Schrader		
Source Title	**Small scale measures under the "Waters neighborhood Days" in Hamburg - Factsheet**		
Year of publication	2007		
Editor/Publisher	Grüne Liga		
Source Weblink	*http://www.wrrl-info.de/docs/wrrl_steckbrief_osterbek.pdf*		
Key People		*Name / affiliation*	*Contact details*

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	2.		
	3.		
	4.		