European Commission

NWRM

Natural Water Retention Measures

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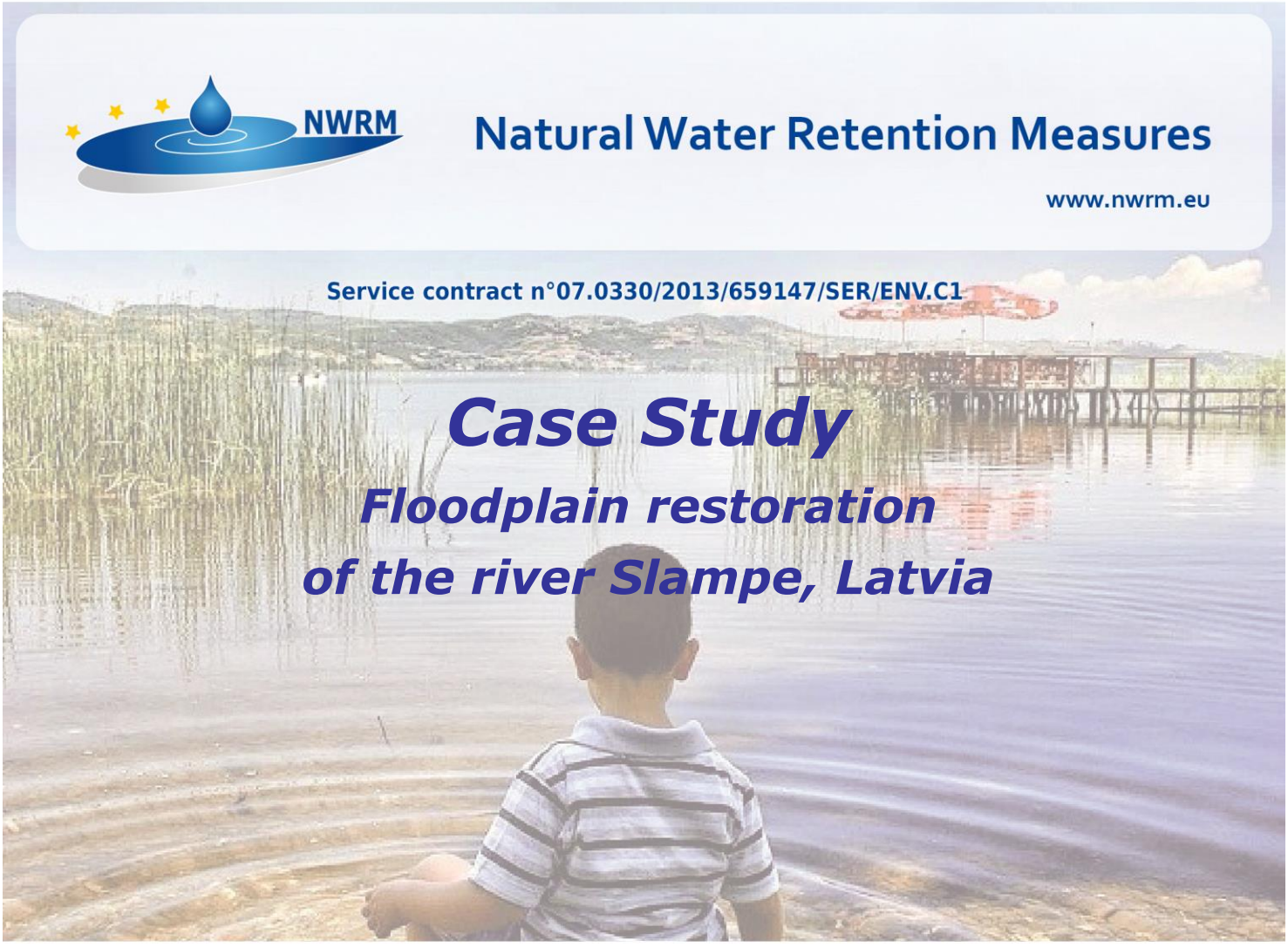

Case Study

Floodplain restoration of the river Slampe, Latvia

Environment

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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I. Basic Information

Application ID	*Latvia_01*			
Application Name	Floodplain restoration of the river Slampe, Latvia			
Application Location	Country:	Latvia	Country 2:	-
	NUTS2 Code		*LV00*	
	River Basin District Code		*LVLUBA*	
	WFD Water Body Code		*L106 SP – Water body code according to the Lielupe river basin management plan*	
	Description		Located in the territory of Ķemeri national park, Dunduru meadows (Džūkste parish, Tukums county)	
Application Site Coordinates	Latitude: 56.8299499 *Specify: WGS84*		Longitude: 23.4008938 *Specify: WGS84*	
Target Sector(s)	Primary:	Hydromorphology		
	Secondary:	Agriculture		
Implemented NWRM(s)	Measure #1:	*N4 - Re-meandering*		
	Measure #2:	*N3- Floodplain*		
Application short description	The river flow regime was restored by re-meandering the river thus also restoring the floodplain. In total 2,1 km long river stretch was restored by digging and damming channelled lower stretch of River Slampe. In parallel, hydrological regime was created in floodplain meadows along river in 105 ha.			

II. Policy context and design targets

Brief description of the problem to be tackled	*In order to make Dunduru meadows more suitable for agriculture, the course of River Slampe was straighten in 1970. Since 1997 Dunduru meadows are included in newly established Ķemeri National park. Maintenance and restoration of the natural assets are the main goals for the park and restoration of the Dunduru meadows helped to restore natural floodplain grasslands ensuring suitable habitat for several species of EU and Latvian importance.*		
What were the primary & secondary targets when designing this application?	Primary target #1:	Other (please describe in the "remarks" below)	
	Primary target #2:	Biodiversity and gene-pool conservation in riparian areas	
	Remarks	*Restoration of floodplain hydrological regime in Dunduru meadows*	
Which specific types of pressures did you aim at mitigating?	Pressure #1:	WFD identified pressure	*4.1.2 Physical alteration of channel/bed/riparian area/shore of water body for agriculture*
	Remarks		
Which specific types of adverse impacts did you aim at mitigating?	Impact #1:	WFD identified impact	*Altered habitats due to hydrological changes (y)*
	Impact #2:	WFD identified impact	*Altered habitats due to morphological changes (y)*
	Impact #3:	Other EU-Directive's identified impact (specify)	*HBD – Habitat and Bird directive*
	Remarks		
Which EU requirements and EU Directives were aimed at being addressed?	Requirement #1:	WFD-restoring a HMWB	*Restored floodplain hydrological regime*
	Requirement #2:	Other EU-Directive requirements (Specify)	*HBD – restored habitat for species of EU importance*
	Requirement #3:	WFD-achievement of good ecological status	
	Requirement #4:	WFD-achieving objectives for Protected areas	*Restored habitat for species of EU importance*
	Remarks		
Which national and/or regional policy challenges and/or requirements aimed to be addressed?			

III. Site characteristics

Dominant Land Use type(s) *CORINE LU types and codes*	Dominant land use	*243 - Land principally occupied by agriculture, with significant areas of natural vegetation*
	Secondary land use	
	Other important land use	
	After implementation of the NWTRM - 321 - Natural grasslands. Meadows are maintained by mowing and natural grazing method.	
Climate zone	cool temperate moist	
Soil type	*Type in the relevant soil type (FAO class) from the list in Annex 3*	
Average Slope		
Mean Annual Rainfall	600 - 900 mm	
Mean Annual Runoff	150 - 300 mm	
Average Runoff coefficient (or % imperviousness on site)	0.2 - 0.3	20 - 40%
	Remarks	
Characterization of water quality status (prior to the implementation of the NWRMs)	Water quality status was not assessed prior to the re-meandering the stretch of the River Slampe. But the water quality status according to benthic macroinvertebrates was assed as moderate in 1998. Concentrations of nutrients (N and P) were significantly increased in some measurements. Assessed aquatic vegetation showed richness of the nutrients in the water.	
Comment on any specific site characteristic that influences the effectiveness of the applied NWRM(s) in a positive or negative way	*Positive way:-*	
	Negative way:-	

IV. Design & implementation parameters

Project scale	Small (e.g. farm, plot, building complex, block)	*2.1 km long stretch of the channeled river was turned in to 4.6 km long meandered stream. Natural floodplain grasslands resorted in 105 ha*
Time frame	Date of installation/construction (MM.YYYY)	*01-05.2005. In total 5 month*
	Expected average lifespan (life expectancy) of the application in years	*Not relevant*
Responsible authority and other stakeholders involved	*Name of responsible authority/ stakeholder*	*Role, responsibilities*
	1. Ķemeri National Park	Project manager and land manager
	2. Meliorprojekts Ltd	Elaboration of technical project, supervision of the

		practical implementation
	3. Visko Ltd	Practical implementation of the meandering technical project
	4. Carl Bro Ltd	Assessment of ecological status according to benthic macroinvertebrates after the project implementation
	5.	
The application was initiated and financed by	Initiated by administration of Ķemeri National park. Financed by EU LIFE Nature programme and Latvian Environmental Protection Fund Administration	
What were specific principles that were followed in the design of this application?	- to restore hydrological regime characteristic to floodplain in surrounding meadows; - costs; - existing relief.	
Area (ha)	Number of hectares treated by the NWRM(s).	*105 ha*
	Text to specify	*Restored floodplain meadows*
Design capacity	No relevant quantitative measurements are carried out	
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	1. Disagreement about land purchase with one of the landowners changed initially projected track of the re-meandered riverbed. 2. According to the national legislation it was not allowed to change hydrological regime in neighboring lands in a result of the re-meandered river.	

V. Biophysical impacts

Impact category (short name) Select from the **drop-down menu** below:	**Impact description** (Text, approx. 200 words)	**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	*Data are not available*	-	-
Peak flow rate reduction	*Data are not available*	-	-
Impact on groundwater	*Data are not available*	-	-
Impact on soil moisture and soil storage capacity	*Data are not available*	-	-
Restoring hydraulic connection	*Data are not available*	-	-
Water quality Improvements	*Data are not available*	-	-
WFD Ecological Status and objectives	*According to the expert judgment, the good ecological status is not achieved yet. However, the monitoring data are not published.*		-
Reducing flood risks (Floods Directive)	*The measure ensured that territories are flooded during the spring.*	-	-
Mitigation of other biophysical impacts in relation to other EU Directives (e.g. Habitats, UWWT, etc.)	*150 ha of restored floodplain meadows. 30 % of restored meadows were flooded by first spring floods, but flooded area depends from the floods volume*	*ha*	*105*
Soil Quality Improvements	*Data are not available*	-	-
Other	*Data are not available*	-	-

VI. Socio-Economic Information

What are the benefits and co-benefits of NWRMs in this application?	The economic benefits from re-meandered and restored floodplain have not been estimated.		
Financial costs	***Total:***	*144 547.81 €*	*Without administrative and personnel costs*
	Capital:	*32 597,15 €*	*Technical project and implementation*
	Land acquisition and value:	*111 950,66 €*	*In total 163,2 ha purchased land*
	Operational:	-	-
	Maintenance:	-	-
	Other:	*No information yet*	*No information yet*
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: not calculated, but before restoration of meanders and floodplains, surrounding lands were used very extensively by agricultural purposes.*		
	Additional costs:-		
	Other opportunity costs:-		
	Comments / Remarks:-		
Which link can be made to the ecosystem services approach?	*Amenities (associated to habitat protection): fish and plants, tourism, recreation, and others*		

VII. Monitoring & maintenance requirements

Monitoring requirements	Monitoring of the groundwater level was planned to be carried out in 13 boreholes at the river Slampe once in a month, but due to financial constraints the water level records are taken very seldom.
Maintenance requirements	Controlling the condition of the dam before estuary of the River Slampe. Responsible authority is the Ķemeri National Park.
What are the administrative costs?	No information

VIII. Performance metrics and assessment criteria

Which assessment methods and practices are used for assessing the biophysical impacts?	The assessment of the ecological status is defined in the national legislation based on the WFD requirements.
Which methods are used to assess costs, benefits and cost-	Not measured

effectiveness of measures?	
How cost-effective are NWRM's compared to "traditional / structural" measures?	Not measured
How do (if applicable) specific basin characteristics influence the effectiveness of measures?	
What is the standard time delay for measuring the effects of the measures?	Hard to say, because benefits were not calculated prior to the project implementation.

IX. Main risks, implications, enabling factors and preconditions

What were the main implementation barriers?	Long procedures to obtain the permit for implementation of NWRM. Negative attitude of the Ministry of Agriculture, since river stretch is the important subject to ensure drainage in the catchment. Attitude of neighboring landowners who are not in favor of over flooded lands Lack of experience of all involved stakeholders
What were the main enabling and success factors?	Availability of financial resources and financing potential to implement such measures.
Financing	EC LIFE Nature programme, Latvian Environmental Protection Fund
Flexibility & Adaptability	Implemented project had a numerous mistakes in technical project that have to be improved.
Transferability	Taking into account EU Policy goals on biodiversity to restore 15 % of depredated land up to 2020, goal of the WFD to reach good water quality, goals of the FD and local conditions, re-meandering and floodplain restoration (for water retention and nutrients capture) is recommendable to implement in a slowly flowing streams within the agricultural lands.

X. Lessons learned

Key lessons	Expert on hydrology have to be involved in the development of the technical project. Hydrological and water quality assessments have to be carried out prior to the re-meandring.

XI. References

Source Type	Project Report
	Scientific Article
	Interview
Source Author(s)	1. Jānis Ķuze, Vita Caune, Andis Liepa, Gunita Krievāne 2. Jānis Ķuze, Andis Liepa, Loreta Urtāne, Zigurds Zēns

Source Title	1. FINAL TECHNICAL REPORT of the project "Conservation of wetlands in Ķemeri National Park, Latvia (project number: LIFE2002/NAT/LV/8496) 2. Kuze J., Liepa A., Urtāne L., Zēns Z. Palienes režīma atjaunošana Slampes upes lejtecē. Aktuālā savvaļas sugu un biotopu apsaimniekošanas problemātika Latvijā		
Year of publication	1. 2007 2. 2008		
Editor/Publisher			
Source Weblink	1. http://www.daba.gov.lv/upload/File/DOC/P_KNP_LIFE_Rep_gala.pdf 2. http://www.daba.gov.lv/upload/File/Publikacijas/ZIN_P_KNP_slampes%20upe.pdf		
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	1.	Jānis Ķuze	*janis.kuze.daba.gov.lv*
	2.		
	3.		
	4.		

XII. Photos Gallery

Figure 1 The river Slampe, before implementation of restoration measures in 2003 (Author Gatis Pavils)

Figure 2 The re-meandering of the river bed of the river Slampe in 2005 (author Andis Liepa)

Figure 3 The river Slampe after restoration (author Janis Kuze)

Figure 4 The river Slampe during snow melts in spring (author Janis Kuze)