



Local residents' perceptions of floodplain restoration measures in Luxembourg's Syr Valley

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ABSTRACT

The need for the restoration of semi-natural floodplain-river systems in Europe is widely recognised, and is currently a major task facing those responsible for conservation policy and water management. However, the long-term success of restoration measures and subsequent floodplain management depends largely on their cultural sustainability, which is related to perceptions of the resultant land use changes. In this study, residents of three communities adjacent to a floodplain restoration project in the Syr Valley (Luxembourg) were surveyed on their perception of the threat to floodplains, and their attitudes towards the restoration measures applied. The restoration involved the relocation of the River Syr into the valley bottom and the installation of a low-intensity grazing system. Although local residents did not perceive the floodplains of Luxembourg to be threatened on the whole, a large majority wanted to see more natural and healthy floodplain ecosystems and sought the implementation of eco-agricultural practices in future floodplain landscapes. Support for river restoration and low-intensity grazing was high, and support for their specific implementation to restore the Syr floodplain even greater. The direction of opinions could be predicted on the basis of basic beliefs, lifestyle concept and environmental behaviour, whereas socio-demographic variables were only of minor importance. These results suggested that the mimicking of past floodplain landscapes was viewed positively by the public, but to guarantee its long-term cultural sustainability landscape planners should direct their information and participation efforts actively towards different lifestyle groups.

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1. Introduction

"Societies interpret their environment according to the way they manage it, and they manage their environment according to the way they interpret it" (Berque et al., 1994).

Including the human dimensions in restoration efforts and in landscape management is vital in Europe, because the sustainability and the survival of the resulting 'new landscapes' in the evolved cultural context depend to a large extent on public support (Connelly et al., 2002). The term 'human dimensions' covers the range of perceptions and attitudes of people in regard to topics such as ecological restoration and landscape planning, and includes aspects of management, aesthetics, naturalness, cleanliness and health, and recreational uses (Gobster, 2001; Gobster and Westphal, 2004). Restoring the ecological value of certain areas has the potential to provoke greater controversy than the setting aside of near pristine habitats (Jackson, 1992). These observations would appear to be particularly true for the restoration and rehabilita-

tion of floodplains and their wetlands. Riparian landscapes may be considered the oldest cultural landscapes in Europe, but also one of the most severely impacted upon by human interventions (Konold, 2005). These interventions have been motivated by agricultural production, but also by protective and sanitary motives. Over recent centuries this economically and socio-culturally driven development has intensified, leading to a deterioration of biodiversity and ecosystem functions in floodplain landscapes (Tockner and Stanford, 2002). Consequently, the restoration of floodplain habitats and the rehabilitation of key ecosystem functions is now a major focus of European environmental policy and science (Middleton, 1999; SER, 2004).

Cultural landscapes require restoration goals that integrate biological and cultural diversity with landscape heterogeneity, health and integrity, and must lead to a restoration of ecosystem services rather than a reconstruction of certain pristine states (Konold, 2007). The final decision on restoration goals, and the long-term approval of the resultant development of the landscape, is subject to public debate and is greatly influenced by emotional and aesthetic factors (Pfadenhauer, 2001). This public discussion is central to overcoming the main obstacles to restoration, namely finances, land availability and the motivations of those who own and value riparian open spaces (Bright et al., 2002; Rispoli and Hambler, 1999).

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The implementation of floodplain restoration in peri-urban areas in particular, where complex land use interests have evolved (Antrop, 2004; Hale and Adams, 2007), requires that the commitment of stakeholders and the general public be maintained by means of appropriate and lasting human management; its 'cultural sustainability' must be ensured (Nassauer, 1997).

In spite of the importance of cultural sustainability in floodplain restoration and management (Zedler and Leach, 1998), the cultural preferences of residents in relation to riparian landscapes, and their specific perceptions of restoration and management measures, have been the focus of little investigation in Europe to date (Decamps, 2001). Policy makers, landscape planners and ecosystem managers must refer to anecdotal information concerning local residents' perceptions and to the opinions expressed by those people actively involved. Existing studies of public perceptions of wetlands have revealed that these areas are less highly appreciated than other habitats, or are even negatively labelled by society as a habitat merely for pests (Anderson and Moss, 1993; Matthews, 1993). However, this trend is changing with recent studies documenting an improved awareness of the biological importance of wetlands (Rispoli and Hambler, 1999), and the greater attractiveness of landscapes dominated by water (Kaltenborn and Bjerke, 2002). Nassauer (2004) stated that the characteristics of wetlands do not comply with certain cultural values such as a sense of control, neatness and safety, and that wetland attractiveness is strongly influenced by cultural features like mown areas and structures providing views onto open water.

It is not only physical features, however, but also the management and landscape context that are responsible for either positive or negative perceptions of restoration measures. Connelly et al. (2002) found in relation to the restoration of the Hudson River Valley that beliefs and past behaviour better explained people's support for ecosystem restoration than socio-demographic characteristics. The groups expressing either a positive or a negative attitude towards ecological restoration in the Chicago metropolitan region differed with respect to their perception of the outcomes and of the importance of restoration, basic beliefs, knowledge and behaviour (Bright et al., 2002). Solecki (1998) underlined the importance of a knowledge of and familiarity with specific management measures in relation to an individual's support for landscape management.

Value orientations and affiliations to certain social interest groups were also strong predictors of an appreciation for landscapes and of conservation attitudes, but also socio-demographic variables such as gender, age and residential situation (Kaltenborn and Bjerke, 2002; Rispoli and Hambler, 1999; Sah and Heinen, 2001). A problem in relation to measuring support for ecological restoration is that restoration goals are often welcomed by residents, but the implementation of specific measures and projects to accomplish these goals frequently lacks the necessary public support (Barro and Bright, 1998; Connelly et al., 2002). There has been little research into the relationship between the public's perception of the threat to floodplains and the support for floodplain restoration and the implementation of specific measures in Europe's peri-urban environments. Correspondingly, there is a lack of information on the appraisal by different lifestyle and social groups of landscapes after river restoration has taken place, and of the reintroduction of traditional land management approaches such as low-intensity grazing.

In this paper the human dimensions of riparian landscapes and floodplain restoration in a peri-urban area of Luxembourg are explored. The objective of the study was to measure local residents' perceptions of riparian landscapes, floodplain restoration measures in general and the Syr Valley Restoration Project (SVP) specifically, and to link them with the perceived threat to the floodplain, basic beliefs, lifestyle concept, knowledge and socio-demographic variables. The following research questions were tackled in a quan-

titative survey of residents in three towns participating in the SVP:

- Are floodplains perceived as threatened, what are the threats to riparian landscapes and what are the prevailing notions with respect to future landscape planning in floodplains?
- What are the local residents' opinions in relation to river restoration and low-intensity grazing as a restoration strategy for riparian landscapes?
- What relationships can be identified between the perceived threats of floodplains and the general perception of restoration measures and their implementation?
- Can support for the measures be predicted on the basis of socio-demographics, lifestyle concept or environmental value orientations?

The results of this study can help those involved in the landscape planning and ecosystem restoration of floodplain areas to better anticipate public support for or opposition to certain measures, to adjust floodplain restoration measures and to develop a future riparian landscape management concept for the peri-urban context that is culturally sustainable.

2. Syr Valley Restoration Project (SVP)

2.1. Site characteristics and historic land use

The Syr is a medium-sized, carbonate upland river. It flows over 32 km within the Luxembourgian escarpment landscape of the Gutland bioclimatic region, to its estuary in the River Mosel. The Upper Syr Valley is located in the gently rolling foothill zone of the Luxembourgian sandstone plateau, which consists mainly of keuper and alluvial formations (Administration des Eaux et Forêts, 1995). The SVP restored a 2.2 km stretch of the River Syr, and over 45 ha of valley bottom shared by the communities Betzdorf, Niederanven and Schuttrange (49°38'N, 6°17'E). The SVP took place in the 375 ha large 'Vallée de la Syre de Moutfort à Roodt/Syre' Special Protected Area, which was designated in January 2004 under the EU Conservation of Wild Birds Directive, and which forms part of the Natura 2000 network.

The earliest historical documents, dating from the late 18th century, show the deforested floodplains of the SVP area with open wetlands and the River Syr in the valley bottom, with livestock grazing as the main land use (Schaich and Konold, 2006). From the beginning of the 19th century massive river regulation and land improvement measures were executed in the floodplain to serve water mills in the adjacent village and to drain unproductive wetlands. The meandering course of the River Syr was completely redirected into a straightened channel along the edge of the valley, and drainage ditches made possible the use of grassland as combined meadow-pasture. In the second half of the 20th century the drainage measures were expanded to allow for the intensification and mechanisation of the floodplain meadows in a two-cut regime. As a consequence, the wetland character of the area vanished, riparian dynamics were impeded, vegetation and site characteristics impoverished, and the floodplain landscape became uniform and less resilient. The SVP area is now located within a peri-urban environment, as it is under the influence of Luxembourg city, but it still exhibits a rural character.

2.2. Planning procedure and restoration measures

The Luxembourgian State Water and Forestry Service assumed responsibility for the planning of the SVP, and collaborated with several landowners in a land consolidation effort in 2002, to amass sufficient floodplain area for the implementation of the project.

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