
How and how much does vegetation in drainage ditches depends on current environmental conditions ?

André Mauchamp¹, Jean Marc Paillisson^{*1}, Olivier Gore^{†2}, Benjamin Bergerot^{‡1}, and Anne Bonis^{§3}

¹UMR (ECOBIO) – UMR 6553 ECOBIO – France

²UMR (ECOBIO) – UMR 6553 ECOBIO – Rennes, France

³UMR 6042 (GEOLAB) – CNRS : UMR6042, Université Clermont Auvergne, CNRS – MSH, 4 rue Ledru, 63057 Clermont-Ferrand Cedex 1, France

Abstract

How and how much does vegetation in drainage ditches depends on current environmental conditions ?

Floodplains are currently heavily managed due to human occupation, uses for agriculture and tourism. Old histories of management include flood management and complex combinations of drainage and irrigation. Moreover, recent intensification may have caused changes in century old agro-systems. However, they often remain cases of human made systems where remnants of wetlands, extensively used and/or temporarily favourable areas combine into rich landscapes. Improving management for biodiversity considering all other uses requires a better understanding of the relationships between biodiversity and a complex set of environmental characteristics with strong internal interactions, and temporal and spatial variability. The Marais poitevin on the French Atlantic coast has been managed for several centuries but major changes occurred in the 1950-60ies. A field approach of biodiversity patterns was developed and combined to inter-annual monitoring of environmental variables in order to address this challenge. Here we document patterns in biodiversity of the vegetation of ditches, a relatively simple community chosen because composed of a limited number of rather well known species, with strong relationships with fauna, and because users, via tourism and fishing activities particularly, are sensitive to its changes. It is highly impacted by all uses via water management. Four year monitoring data of the community allowed to assess the relevant scales of patterns and changes of biodiversity and determine the main relationships with environmental variables. Diversity resulted in both broad patterns due to the geological history of the floodplain that determine soil and groundwater characteristics, and local processes. The predictive ability of models based on current conditions was limited, possibly due to interactions among factors, temporal lags, and unrecorded human activities. Results are discussed in relation to the management of the area, and strategies for agro-environmental schemes.

*Corresponding author: jean-marc.paillisson@univ-rennes1.fr

†Corresponding author: olivier.gore@univ-rennes1.fr

‡Corresponding author: benjamin.bergerot@univ-rennes1.fr

§Speaker