Early successional vegetation patterns of alluvial deposits following dam removal: a functional approach

Marianne Laslier*[1], Charlotte Ravot[2], Patricia Rodríguez González[3], Ivan Bernez[4], Laurence Hubert-Moy[1], and Simon Dufour[1]

[1]LETG Rennes - UMR CNRS 6554 – LETG Rennes : UMRCNRS 6554- Université Rennes 2 – France
[2]Biodiversité agroécologie et aménagement du paysage (UMR BAGAP) – ESA - Ecole supérieure dÁgriculture dÁngers, Agrocampus Ouest, Institut National de la Recherche Agronomique, ESA - Ecole supérieure dÁgriculture dÁngers, ESA - Ecole supérieure dÁgriculture dÁngers, ESA - Ecole supérieure dÁgriculture dÁngers – 65 rue de Saint-Brieuc 35042 Rennes, France
[3]Centro de Estudos Florestais, Instituto Superior de Agronomia – Universidade de Lisboa, Tapada da Ajuda 1349-017 Lisboa Portugal, Portugal
[4]Écologie et santé des écosystèmes (ESE) – Institut national de la recherche agronomique (INRA) : UMR985, Agrocampus Ouest – AGROCAMPUS OUEST Centre de Rennes 65 rue de Saint-Brieuc 35042 Rennes cedex, France

Abstract

The early successional vegetation stage is crucial for ecosystem development. A good understanding of this stage is especially important in restoration projects. Fluvial systems, heavily human-modified are now subject to increasing restoration efforts such as dam removal, are notably concerned. This study aims to describe the fine-scale spatial and temporal patterns of the initial phase of colonization in a dam removal context using a functional approach. The study was conducted on the Sélune River (Normandy, France), where two dams, 32 and 16 m high, respectively, are in the process of being removed. We recorded vegetation cover and composition changes during the 2015 growing season on dewatered alluvial deposits at two scales and three dates (March, May and July at site scale, March, June and September at impoundment scale). Grime Strategies and functional traits related to sediment stabilization and colonization capacity were recorded for each species according to databases. Physical drivers were estimated using spatial proxies: the distance to and the relative elevation from the channel, the longitudinal distance of the sampling station to upstream. Results showed at the two scales a rapid terrestrialization of the formerly submerged area. The colonization patterns of plant communities during the growing season exhibit an increase in species richness, a shift from ruderal to competitor species and a sediment stabilization potential notably by herbaceous species. Interestingly, we observed meaningful cover of species with hemirosettes all over the vegetation season. Moreover, pollination was mostly operated by abiotic factors in early season, and by biotic factors in late season. Woody species (*Salix atrocinerea* Brot and *Alnus glutinosa* (L.) Gaertn) regeneration was registered in the late growing season. Vegetation patterns were more influenced by abiotic factors in the early growing season than in the late growing season. These results highlight the passive restoration potential of vegetation colonization.

*Speaker