
Time-lagged response of vegetation communities to agricultural landscape changes along the Sélune river, France

Audrey Alignier*¹, Lily Castay¹, Julien Deniau², Elven Lanoë, Audrey Prampart¹, and Alejandro Zermeno-Rodriguez¹

¹Biodiversité agroécologie et aménagement du paysage (INRA UMR 0980 BAGAP) – ESA - Ecole supérieure d'Agriculture d'Angers, Agrocampus Ouest, Institut National de la Recherche Agronomique, ESA - Ecole supérieure d'Agriculture d'Angers – 65 rue de Saint-Brieuc 35042 Rennes, France

²Communauté de communes St-Méen Montauban – Communauté de communes St-Méen Montauban – Manoir de la Ville Cotterel 46 rue de Saint Malo BP 26042 35360 Montauban-de-Bretagne, France

Abstract

Scheduled to begin in 2020, the removal of two dams on the Sélune River, Manche (France) will be one of the largest river restoration projects undertaken in Europe. Expected consequences of dam removal include benefits from restoring more natural flow and sediment regimes but also impacts on biodiversity and associated ecosystem services due to changes in landscapes and agricultural dynamics. It can be challenging to discern such shifts while natural ecological and physical processes have been suppressed or altered since the installation of dams in the 1920s. Long-term analysis is a necessary step to provide knowledge on how present conditions came about and understand current patterns before analyzing the consequences induced by dam removal.

Changes in landscape composition and configuration is considered to be one of the main drivers behind biodiversity patterns. An often neglected issue concerns the temporal scale of biodiversity response to landscape change. Here, we investigated the response of vegetation communities to compositional and configurational changes in the landscape, over 10 years. We performed exhaustive vegetation surveys in fields located in 9 1 x 1 km² agricultural landscapes, distributed from upstream to downstream, which are selected to represent a gradient in landscape heterogeneity. In total, 37 fields were sampled pertaining to three habitat types constituting a perturbation intensity gradient: extensive wet meadows, grasslands and cereal fields. First results showed that species richness and diversity were more related to past than to present-day landscape composition.

Our results highlight the importance of taking account of time to explain current patterns of vegetation communities. It emphasizes the importance of long-term observations to understand some ecological patterns that would be missed in short-term studies. We suggest that care should be taken when assessing the effectiveness of the Sélune river restoration as time delays between dam removal and its consequences may occur.

*Speaker