

Restoration of riparian vegetation in a context of dam removal: Soil seed bank, in situ observations and remote sensing analysis to understand vegetation responses.

Marianne Laslier¹, Isabelle Muller², Stéphane Fraisse², Ivan Bernez², Laurence Hubert-Moy¹, Simon Dufour¹

¹UMR CNRS 6554 LETG Rennes COSTEL, Université Haute Bretagne, Place Henri Le Moal, 35043 Rennes cedex, France

²UMR INRA 985 ESE, Agrocampus Ouest, 65 rue de Saint Brieu, 35042 Rennes Cedex, France

Dam removal is potentially a powerful tool for river and riparian restoration. Through dam removal, new bare sediment appears and can be colonized by riparian vegetation. By their position interlinked between terrestrial and aquatic systems, the riparian vegetation plays a crucial role in the ecological quality of the restored river. Study and understand this vegetation colonization is thus particularly relevant. In the west of France (Manche), two dams on the Sélune River will be removed. The water level of the reservoir lake is gradually lowered over a period of 4 years before the dam removal. We used two different methods to monitor and study plant community colonization. The first one is on a global scale on the reservoir lake. We used extant vegetation surveys in 1m² quadrat positioned in a longitudinal gradient along the river course and in a lateral gradient to the riverbed. We associated vegetation surveys with soil seed bank investigation in order 1) to evaluate the success restoration potentiality, 2) to predict the trajectory of the plant succession and 3) to understand processes structuring plant communities. The second method is at a finer scale using drone technology. Particularly, drones allows a very accurate spatial information (4cm spatial resolution), and temporal information (images acquisition every two months). Remote sensing enables us to product a spatially continuous map of vegetation cover and of vegetation communities for each date of acquisition, even in non-accessible areas. In situ and remote sensing approaches seem to be complementary, and should be used simultaneously. The results show the importance to use both, in order to understand vegetation colonization and succession.

