

## ***Interactive comment on “Spatio-temporal heterogeneity of riparian soil morphology in a restored floodplain” by B. Fournier et al.***

**B. Fournier et al.**

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Response to reviewer's comments:

General remarks: Reviewer 2 explicitly supported the study. However, he highlighted, in agreement with reviewer 1, some lacks in the description of the study site. These lacks alongside specific remarks of reviewer 2 were addressed in the revised version (+ see response to reviewer 1). Reviewer 3 acknowledged that the use of soils constitutes a promising and innovative approach to measure the effects of restorations and that the present study provides a clear demonstration of its effectiveness. However, reviewer 3 pointed out the issue of the time since restoration and criticised our conclusion of a partial success of the restoration project. He was right saying that we cannot conclude

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that the project was partial success before several major floods ( $\geq$  HQ20) with strong influence on the forest sites has occurred. With this respect, our conclusion was only preliminary and needs to be confirmed or affirmed later. These temporal aspects related to flood events were improved in the revised version. Moreover, we added, as supplementary material, a table summarising the main flood events before and after restoration (see below).

Reviewer 3 also highlighted that we did not consider the feedback effects between soil evolution and the litter provided by vegetation. As a result, he suggested envisaging the consistency between vegetation and soil type as an indicator of successful restoration when the dynamic ecological balance has been reached. This question was briefly discussed in the revised version.

Specific remarks: P4341/L19: “Restoration had the highest impact...” The highest and fastest? (see comments on time scale) - The sentence was rephrased as “Most of the restoration works were conducted in this area”

P4348/L14-15: “Plant species diversity and evenness were higher in the forest whereas the open habitats and forest had similar values of species diversity.” Contradiction? - Contradiction indeed... The sentence was rephrased as “Plant species diversity (N2) and evenness (E2) were higher in the forest whereas the open habitats and forest had comparable values of species richness (N0).”

P4350/L6-7: “...but the lack of typical hydromorphic soils could have been improved by integrating soil morphology in early project planning.” How? Rewording? - This sentence was re-written in the process of improving the overall discussion about the time scale.

Table 1a: Number of horizons, example group 1: I don't understand how 7 loam horizons, 47 sandy loam horizons could lead to an average of 2-4 horizons per profile? - The average number of soil profiles per group lies in the given intervals. However, when a group was represented by an equivalent proportion of soils with 2, 3 or 4 hori-

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zons per profile, we indicated the intervals rather than the exact mean. This was better explained in the revised version.

Table 1b: possible to provide link between “low” (or medium, ...) organic matter content and percentage of organic matter (as quoted in text P4342/L17)? - done

Figure 4: do not appear in text - Figure 4 was properly cited in the text.

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Supplementary Table 1. Occurrences of floods with a frequency equal or superior to two years ( $\geq$  HQ2) between 1994 and 2007. The dashed line separates the flood events that occurred before the restoration from those that occurred after. Forest sites are inundated when river discharge is superior or equal to  $630 \text{ m}^3\text{s}^{-1}$  and control pasture sites when superior or equal to  $415 \text{ m}^3\text{s}^{-1}$  (Samaritani et al. 2011).

Year	Month	Day	River discharge [ $\text{m}^3\text{s}^{-1}$ ]	HQ
1994	5	25	690	2
1994	7	7	680	2
1995	1	26	660	2
1995	6	1	730	5
1995	8	9	570	2
1995	12	25	630	2
1996	7	9	610	2
1999	5	13	1130	100
2000	8	6	650	2
2000	9	21	710	2
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2002	8	12	880	10
2002	9	24	780	5
2004	1	14	768	5
2005	8	23	720	5
2006	3	9	560	2
2006	9	17	717	5
2007	8	9	791	5

Fig. 1. Supplementary Table 1.

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