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Interactive comment on “Nitrate removal in a restored riparian groundwater system: functioning and importance of individual riparian zones” by S. Peter et al.

Anonymous Referee #2

Received and published: 2 September 2012

Title: Nitrate removal in a restored riparian groundwater system: Functioning and importance of individual riparian zones Author(s): S. Peter et al. MS No.: bg-2012-168 MS Type: Research Article

GENERAL CRITERIA The manuscript represent a good contribution to scientific progress on buffer zones efficiency after river and its corridor restoration project (Good). The interdisciplinary of the authors group and the level of interaction between the different scientific disciplines are excellent (Excellent). In my opinion there are too many references to other manuscripts that hide information for easy comprehension of the text. Inter-disciplinarity is definitely a good step but the results and discussion

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should be as clear as possible and well-structured (Fair)

INDIVIDUAL SCIENTIFIC QUESTIONS Results 3.1 Hydrodynamics It is not clear to me why the upper soil, usually the most active part, is excluded from the budget. The river feed groundwater but what going on in the first two meters? Is it any temporary sub-superficial flow come from field during heavy rain? Did you checked if there was any hydraulic connectivity between field and FPZ? 3.3 Nitrogen budgets for individual FPZ The groundwater is really isolated form the top layer in the willow bush or forest?. The root-system can break the impermeable layer making vertical flow-path, Was it checked? 3.5 Is it possible to explain more about how you calculated the abundance? Which is your unit volume? 3.6 Cloud be very useful to have C content of the soil profile too.

Discussion In general, the discussion could be improved by an analysis with more purpose application instead of a re-analysis of the results. For the same reason I would like to suggest to add also the mg/l unit for a faster understanding and comparison with other systems. The sentence between line 5 and 10 (pag 6730) seems quite discounted and I do not understand the added value of its. Lines between 5 and 10 (pag 6731) I am not sure that could be enough one references (what does it means companion study? same study site? To support your comments please be more scientifically persuasive or cogent. Lines 19 to 25 (pag 6733) May be the willow bush is a hot spot because the higher water table than the willows vegetation itself, but this is not clear explained in your manuscript.

Conclusions Could be very useful to indicate or suggest which are the most effective parameters to monitor the nitrogen removal efficiency of a riparian zone within restoration measures. Moreover to facilitate a good comparison with other systems and restoration projects I suggest to add the efficiency of NO₃ removal in kg/ha .

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