SPUNKIAD for

Wohl, E. 2011. Seeing the Forest and the Trees: Wood in Stream Restoration in the Colorado Front Range, United States. Pages 399-418 Stream Restoration in Dynamic Fluvial Systems: Scientific Approaches, Analyses, and Tools. AGU, Washington, DC.

Surprising?

I found surprising that the role of fire in controlling wood load in streams could some years increase the wood load and other years decrease it. This variation was due to bigger climatic events like the ENSO, PDO and AMO circulations.

Puzzling?

I found puzzling that the author concluded with the possibilities of doing in-stream restoration (or rehabilitation) of wood loads to streams, without assessing the sustainability of these efforts in the long term in relation to the ecological benefits this intervention might bring.

Useful?

I found useful the first equation presented on page 401 where the lateral recruitment of wood is a function of forest mortality, trees toppled from wildlife and windstorms, bank erosion, mass movement and exhumation of buried wood. This made explicit the link between terrestrial and aquatic systems.

New?

I found new that being able to estimate wood loads in bigger streams, with greater drainage areas, was a challenge because there are no reference streams.

Knew it already?

I already knew that headwater streams represent - in terms of kilometers – the longest segments, and have the greatest influences from neighboring woods because they have the smallest channel widths compared to higher order streams.

Interesting?

I found interesting the difficulty in scaling up – temporally and spatially – the calculations of wood load throughout a stream, from the headwaters to mouth because of all the other factors that come into play: mining, land use change, beaver dams and timber harvests.

Do you agree or disagree with the findings?

I agree with the findings in that they did their best to calculate wood loads – historic and current – from different sources of information and using surrogates to measure what actually gets to the stream. However, I consider this approximation to be small in scale which presents an obstacle when managing larger spatial scales.

Tiz Mogollón November 5, 2012

Reflection

Wohl (2011) made me reflect on mainly four aspects: considering the role wood play in streams, the relation and drivers between aquatic and terrestrial systems and the processes between these, the irrelevancy of restoring at the reach scale and the conflicts that exist between adding wood-load to streams and other human uses of the stream.

Before reading this paper, I had not really thought through the importance of wood in streams. While the paper addressed mostly ways to measure wood load, instead of explaining the biological role of it in streams, I was able to understand the way wood provides hydraulic diversity (roughness, sediment storage, enhanced scour, channel morphology and streambed gradient), as well as ecological diversity (retention of organic matter and nutrients, provide food and habitat for many species). These properties at the bottom of the food pyramid – macroinvertebrates – then become also important for predators of these organisms: trout.

Besides from the function of wood load within the streams, I was also interested at the many processes that come together to get that wood into the stream. For example, if there is a fire then this causes wood to be "released" to the ground. However, this fallen tree gets only mobilized to the stream if there is a big rainfall event, sufficient to push all the debris into the stream. This event then makes the wood available to the stream. Without the fire and without the rain event, there would be almost no pathway of wood getting into streams.

While Wohl (2011) recognizes the impact climate change can have on in-stream wood loads in seeing an earlier peak annual snowmelt, his main take-home is to refine the equations needed to estimate in-stream wood load to restore segments of streams. This however is contrary to what we've read and concluded from other studies. Working at the reach or segment scale in streams will do little to improve the biological integrity of streams, mainly because of the scale. It would be unsustainable to add wood loads into the future into streams that have lost their permanent wood source because of human impacts. This will only benefit a very small segment and the costs are insurmountable.

Stepping away from Wohl (2011), there seems to be conflicting uses and regards for wood in streams when taking into account other interests. Some of those conflicts are mining, timber harvesting, and wood that is cleared out of streams to permit other stream uses, such as recreational activities (boating). However, permitting streams to have wood in them allows for healthier ecosystems that are in turn going to impact humans in mainly two ways: cleaner water and abundant fish for fishing opportunities. There are trade-offs between these uses, and no one ecosystem service is going to be prevalent over the other one everywhere.