From: Dave Allan
To: Armitage, Thomas; Goodman, Iris; Amanda D. Rodewald
Subject: some thoughts on the April 28 conference call
Date: Thursday, May 01, 2014 2:21:48 PM
Attachments: thoughts on April 28 conference call_Allan.docx

Tom, Amanda, Iris:

my comments are embedded below and attached. I leave it to your judgment whether to share with others. I hope these comments are helpful - you have a challenging task to get all these cats headed in the same direction.

Dave

The gradient of connectivity is largely elucidated through the discussion of spatial and temporal scales. Because of the importance of this issue, and of providing the EPA Draft Report with advice on how to discuss the gradient of connectivity, I suggest that the section on "Spatial and Temporal Scales (p 19 under Section 3.2.5) be elevated into the connectivity framework. In addition, it should be expanded (i.e., it is not simply one of several "layers of complexity"). Some topics that appear elsewhere might be gathered into this section, for example the mention of variable source areas (p15-16).

The EPA Report could describe the well-known frequency-magnitude relationship for streamflow and floods, ranging from channel over-topping in 2 years out of three, to decadal and 100 year floods. Using the 100-year floodplain as an example could allow EPA to make a case for century-scale timelines. A figure such as Figure 4 in Poff et al. (*BioScience*, Dec 1997) or other similar figure could easily convey that events of low frequency but high magnitude change the spatial extent of connectivity of surface waters in ways that impact ecosystem function. Reference to the environmental flows literature (A.H. Arthington, *Environmental Flows*, 2012 U California Press) could help to establish the broad basis for consideration of the importance of rare and episodic events, again on timescales of decades to centuries. The EPA Report should clarify that use of flood analysis for rivers is illustrative, and may apply to wetland connectivity, or not.

Transitions to geomorphology (such as debris flows) and ground water connectivity should follow, noting that events occurring on even longer time scales, and connectivity spanning even greater areas, may ensure connectivity that would not be apparent from examination of surface waters . Careful consideration should be given to whether examples of connectivity on the timescale of millennia helps the EPA Report explain connectivity to decision makers.

Overall, the discussion of spatial and temporal scales should be elevated into the discussion of the gradient, and care should be taken that the concept of gradient not be submerged beneath individual examples that imply extremely long time scales or great spatial extent, but may have marginal generality.

I appreciate that these are general comments that require committee consideration, and, if found useful, will require some re-drafting. I am happy to help with this, but also happy to leave any changes in the hands of those assigned to these sections.

David Allan 5/1/2014

J. David Allan
Professor, School of Natural Resources & Environment
University of Michigan
Ann Arbor, MI 48109-1041
dallan@umich.edu
ph. 734.764.6553 fax 734.763.8965
http://snre.umich.edu/profile/dallan