# Local Impact of an integrated policy for sedimentary and ecological continuity restoration on Gomphidae habitat: the Loire River Example

**Gregoire M. Maillet**[1], **Denis Lafage**[2]

[1]University of Angers, UMR 6112 LPG-BIAF, 02 bd Lavoisier, 49000 Angers, France
Phone: +33-(0)-241735288
[2]Conservatoire d'espaces naturels des Pays de la Loire, 1, rue Célestin Freinet 44200 Nantes, France
E-mail: gregoire.maillet@univ-angers.fr

**Introduction:** To restore sedimentary and ecological continuity, the « Loire River and its tributaries restoration Plan » aims to remove the weirs from the majority of secondary channels throughout the largest French catchment area (117 500 km²). In this context, two weirs have been destroyed in 2014 upstream (diffluence) and downstream (confluence) of the Louet Arm (lenght: 25 km ; mean water flow: 14m3.s-1). During these works, 2 Gomphidae species, referred in annexes II and IV of the 1992 fauna-flora habitat directive, have been found in abundance: 2210 Gomphus flavipes exuviae and 183 Ophiogomphus cecilia exuviae..

**Methods:** From 2014 to 2016, a protocol to monitor the populations were set up, jointly with an annual survey of channel morphology and sedimentology along 11 cross channel profiles from upstream to downstream Louet Arm.

**Results:** First results indicate a sandy river bed with a Q50 grain size (700 µm) stable over time, but witch variability increases progressively (σ2014=460 ; σ2015=640 ; σ2016=1010). A third grain-size mode appears in the sinuous sectors (>1000µm) with a channel asymmetry increase. Moreover, the channel bottom has dropped one meter along the downstream 14.000 m, creating a huge sandy lobe (25m diameter) at the Louet-Loire confluence (figure 1). Gomphidae sp. always exist but the 2016 count reveals an important decrease of abundance with only 76 Gomphus flavipes and 13 Ophiogomphus cecilia detected.

**Discussion:** This study shows that the channel recalibration may have an impact on the Gomphidae presence, but a 4 years monitoring is currently too short to confirm this hypothesis. Nevertheless, this highlights a scale paradox: a good decision to improve ecological quality of large river catchment area could have negative effects on small tributaries.


**Fig. 1:** Confluence between Loire River and Louet arm after downstream weirs removal (data @2018 Google)