

# Improving toad tunnel efficiency at Parassapuszta, Hungary: inappropriate design and construction could partly be counter-balanced by maintenance

Miklós Puky<sup>1</sup> – Timea Mechura<sup>2</sup> – Dorottya Gémesi<sup>3</sup> – Gergely Szövényi<sup>4</sup>  
<sup>1</sup>h7949puk@ella.hu, <sup>2</sup>timikee@freemail.hu, <sup>3</sup>mesido@freemail.hu, <sup>4</sup>gegesz@elte.hu

<sup>1</sup> Hungarian Danube Research Station of the Institute of Ecology and Botany of the Hungarian Academy of Sciences

2131 Göd, Jávorka S. u. 14., Hungary

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Mitigation measures to help amphibian migration under roads have been made since the late 1960s in Europe. Its design, however, is a matter of discussion till today. The Hont – Parassapuszta section of the no. 2. road in Hungary is a site of amphibian rescue since 1987. In 2006 a mitigation measure was built including already existing culverts as well as new toad tunnels connected by plastic fences. No advice was taken from local experts, however, either in the planning or in the construction phase of the mitigation measure resulting in a system inadequate for helping amphibian crossing. Lack of maintenance made the situation even worse with less than 0.5% of amphibians in the tunnels during the 2007 and 2008 migration period. In spring, 2009 fences were improved and connected to the tunnel entrances in a more appropriate way. Maintenance increased the ratio of amphibians crossing under the road to over 10%. Common toads (*Bufo bufo*) were found in the tunnels most often using both modified culverts and new tunnels. The highest species diversity was recorded in the largest culvert, through which other amphibian species (*Bufo viridis*, *Pelobates fuscus*) and grass snakes (*Natrix natrix*) also moved from their hibernation area to their breeding site or summer habitat.