# Persistence of small wildlife carcasses on the road and its importance in roadkill surveys

Annaelle Benard*[1,2] and Thierry Lengagne[3]

[1]Laboratoire d'Écologie des Hydrosystèmes Naturels et Anthropisés, LEHNA UMR 5023 – Université Claude Bernard - Lyon I, Centre National de la Recherche Scientifique - CNRS, École Nationale des Travaux Publics de l'État [ENTPE] – France

[2]Laboratoire Biométrie et Biologie Évolutive, LBBE UMR 5558 – Université Claude Bernard Lyon 1, Institut National de Recherche en Informatique et en Automatique, VetAgro Sup - Institut national d'enseignement supérieur et de recherche en alimentation, santé animale, sciences agronomiques et de l'environnement, Centre National de la Recherche Scientifique - CNRS – France

[3]Laboratoire d'Écologie des Hydrosystèmes Naturels et Anthropisés, LEHNA UMR 5023 – Université Claude Bernard - Lyon I, Centre National de la Recherche Scientifique - CNRS, École Nationale des Travaux Publics de l'État [ENTPE] – France

**Résumé**

New roads are being constructed every day, and this rapidly expanding network poses a threat to the persistence of many terrestrial species due to the mortality associated with wildlife-vehicle collisions. The first step towards lessening the impact of vehicular mortality is to produce estimates of the magnitude of this mortality, and to accurately identify when and where these collisions occur. However, data collected through periodic roadkill monitoring may misrepresent actual collisions: animal carcasses do not remain on the road indefinitely, and their disappearance rates may vary depending on species, road characteristics, and environmental factors. While recent studies have attempted to estimate how many days roadkill persists under varying road traffic and weather conditions, roadkill persistence rates remain poorly understood, particularly for small-bodied species that most likely remain on roads for less than a full day after a collision. To address this issue, we conducted a study where we placed small passerine ($<$ 20g) and anuran carcasses on stretches of road with varying volumes of traffic and precipitations, which were then surveyed every 2 hours. This allowed us to refine current persistence estimates: half of the bird carcasses disappeared in less than 30 minutes regardless of weather conditions and road traffic, while amphibians median persistence time was 1–18 hours, depending on the volume of traffic. We then discuss the implications of these results for both taxa: by conducting common toad (*Bufo bufo*) roadkill surveys only 3 hours after their reproductive migration across a road, and taking into account the volume of traffic, we estimate that half of the carcasses have already disappeared and are therefore not being counted. In a second example, using data from the citizen science project Fauna-Aura, we estimate that up to 10 passerines per kilometer could be killed by vehicles each year in southeastern France, a region where some of these species have been experiencing rapid population decline over the past two decades according to the French Breeding Bird Survey (*Suivi Temporel des Oiseaux Communs*).

*Intervenant

**Mots-Clés:** wildlife vehicle collisions, roadkill persistence, passerine, amphibians, wildlife conservation, road ecology