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Conference Abstract

Transboundary monitoring and management of the northernmost invasive population of the African clawed frog (*Xenopus laevis*): Is there still any hope?

Maud Segal‡, Teun Everts‡, Loïc van Doorn‡, Jeroen Speybroeck‡, Rein Brys‡, Tim Adriaens‡

‡ Research Institute for Nature and Forest, Brussels, Belgium

Corresponding author: Maud Segal (maud.segal@inbo.be)

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Abstract

The non-native invasive African clawed frog (*Xenopus laevis*) poses a severe threat to native aquatic biodiversity worldwide. In Europe, its northernmost introduced population has established a stronghold along the French-Belgian border. While the earliest documented record in Belgium dates back to 2006 (though only made public in 2019), the discovery of a population in la Chapelle-d'Armentières (in northern France) in 2018 highlighted an impending transboundary threat. By 2021, the species' presence was confirmed in both Flemish and Walloon regions of Belgium.

To delineate the spatial extent of this invasion, extensive environmental DNA (eDNA) monitoring campaigns were conducted in 2020, 2022 and 2023, in the context of an early-detection-rapid response program. A novel "pooled" eDNA sampling strategy was developed, combining water from multiple sites into single filters to maximize spatial coverage while minimizing analytical costs (Everts et al., 2025). This effort revealed an interconnected transboundary population spanning an occupied area of 103 km². The eDNA results not only revealed a more widespread occurrence than previously thought, it also fundamentally shifted our understanding of their dispersal, underscoring the critical role of lotic systems as primary corridors facilitating cross-border migration. Furthermore,

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absolute *X. laevis* eDNA concentrations allowed us to differentiate between ponds with low incidental presence (18% of sampled sites) and those with high concentration indicative of active reproduction (6%). The relatively low percentage of high-concentration ponds indicate complete eradication may still be within reach.

Shortly after detection, rapid eradication efforts were evaluated to eliminate key breeding ponds. Two primary methodologies were tested: quicklime (calcium oxide) application and intensive fyke trapping. Quickliming proved highly effective for rapid, whole-system population removal by temporarily elevating water pH to lethal levels. While it offers the advantage of breaking down into naturally occurring minerals, its non-selective nature makes it unsuitable for habitats supporting protected native species. Furthermore, it requires substantial logistical effort. Conversely, benthic entrapment using fyke nets effectively targets *X. laevis* while minimizing native by-catch. However, trapping is too inefficient and time-consuming in high density ponds.

Given the scale of the invasion, a coordinated eradication project was launched in early 2026, supported by the IUCN rapid response fund. This collaboration unites stakeholders from Flanders (INBO, ANB) and Wallonia (SPW, CREL) to systematically treat colonized ponds and the river system. Management is prioritized on breeding ponds and from West to East to prevent dispersal into the adjacent pristine Yzer river basin. Utilizing a context-tailored approach, the strategy for ponds integrates pond filling, physical barrier installation, fyke netting, drainage and quickliming. Passive barriers at critical points in the stream are used to lower dispersal probability. With these collections of efforts, we hope to at least contain the invasion, and hopefully contribute to its complete removal in the long term.

Everts T, van Doorn L, Adriaens T, Neyrinck S, Kerckhofs K, Speybroeck J, Brys R (2025) Mapping the northernmost transnational non-native population of Xenopus laevis using pooled eDNA sampling. In: Anastácio P, Ribeiro F, Chainho P (Eds) Invasions in Aquatic Systems. NeoBiota 102: 227-248. https://doi.org/10.3897/neobiota.102.150311

Keywords

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Presenting author

Maud Segal

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Conflicts of interest

The authors have declared that no competing interests exist.