Control of invasive American bullfrog in small and shallow ponds

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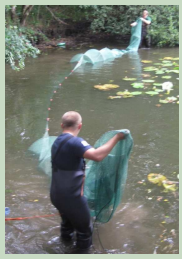
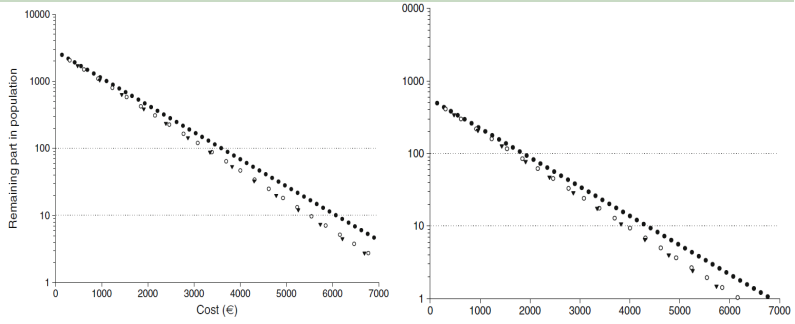
Management of invasive American bullfrog is extremely challenging due to the species' flexible life history and population biology. So far, no effective management tools have been identified. We assessed the catchability of bullfrog with double fyke nets. We conclude that for small, isolated populations with <10 reproduction sites, eradication with double fyke nets is a feasible option.

Introduction

American bullfrog have been introduced all over the globe, causing substantial ecological damage. Negative impact includes competition, predation and pathogen transmission. In Flanders (northern Belgium), the species thrives well in small (< 4000 m²) and shallow ponds on sandy soil. These freshwater habitats are often in a turbid state due to excess algae and overabundant (non-native) fish. Native amphibians are virtually absent here, justifying effective management of this amphibian invader.



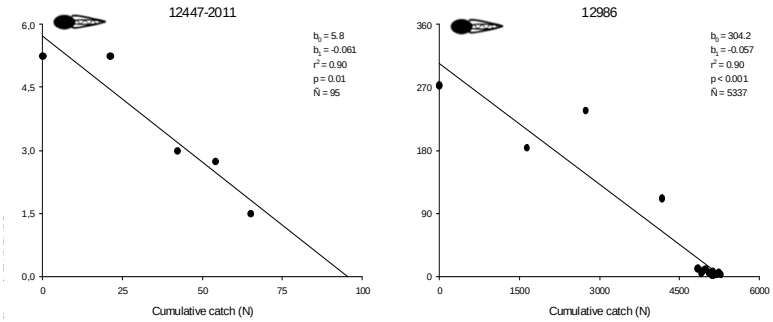


Objectives

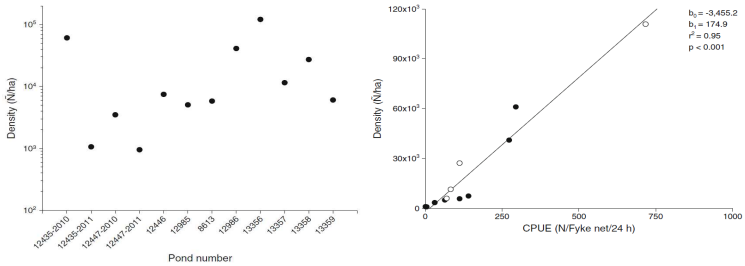
- Determine **population size** of tadpoles using CMR and depletion
- Assess **catchability** of bullfrog tadpoles and adults with double fyke nets
- Build **scenario's for cost-efficient depletion** of tadpole populations in small shallow ponds

Results

- Population density of bullfrog tadpoles varied considerably among ponds, averaging 25.000 tadpoles/ha (SE 10.286) with a range of 950-120.804.
- Catchability of bullfrog tadpoles proved fairly consistent over ponds, with **one CPUE (= 1 fyke for 24h) catching 6 % (SE 1) of the tadpole population (range 2-11%).**



- The relationship between the CPUE and the estimated population size and density of bullfrog tadpoles was highly significant, meaning that **one CPUE can provide good estimate of the actual population size and density** in small shallow water bodies.



Conclusions

- Considerable amounts of tadpoles (also metamorphs & adults) can be removed with rather limited budget using this gear
- Double fyke method is suitable in regions where only a limited number of water bodies are colonized
- Given the **rather low projected costs** (around 2,500 to 5,000 € per pond and per season), actions should be aimed at reaching a minimal number of individuals reaching metamorph and adult stages

Further reading

Louette G. 2012. Use of a native predator for the control of an invasive amphibian. *Wildlife Research* 39: 271-278.

Louette G., Devisscher,S. & Adriaens, T. (2012). Control of invasive American bullfrog *Lithobates catesbeianus* in small shallow water bodies. *Eur J Wildl Res* DOI 10.1007/s10344-012-0655-x.

Sharifian-Fard, M., Pasmans, F., Adriaensen, C., Devisscher, S., Adriaens, T., Louette, G., Martel, A. (2011). Ranavirosis in invasive bullfrogs, Belgium. *Emerging Infectious Diseases* 17(12): 2371-2372.

Acknowledgements

This study was performed in the framework of EU Interreg IVA project IVA-VLANED-2.31 "Invasieve exoten in Vlaanderen en Zuid-Nederland–INVEXO". We thank all who helped during the sampling campaigns. We are grateful to the different site owners and involved governments for their support. Euthanasia of caught bullfrogs was conducted according to the legal regulations in Belgium.

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