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Conference Abstract

Beyond control: ecosystem-based management of invasive alien crayfish

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Abstract

Invasive alien crayfish have become a widespread challenge in freshwater ecosystems across Europe, where their impacts extend beyond species-level effects to influence entire ecosystem functioning. While monitoring and detection remain essential components of management, increasing attention is being directed towards ecosystem-based approaches that address the underlying conditions facilitating crayfish establishment and impact.

Experiences from both Belgium and the Netherlands demonstrate that long-term management success is unlikely to be achieved through direct control measures alone. Intensive trapping and other population reduction techniques can contribute to local impact mitigation but rarely result in sustained population suppression at larger spatial scales. Instead, management is increasingly shifting towards integrated strategies that combine targeted control with ecological restoration, habitat management and biological control.

A key lesson learned is the importance of restoring ecosystem resilience. Improving water quality, enhancing habitat diversity, and supporting healthy aquatic food webs can strengthen the resistance of freshwater ecosystems to invasive crayfish impacts. Recent experiences in the Netherlands suggest that nature-friendly riverbanks and riparian habitat restoration may contribute to lower crayfish densities by promoting more diverse and resilient aquatic communities and improving habitat conditions for native species. Particular attention is also being given to the role of predators, including native and

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established fish species, which may contribute to regulating crayfish populations as part of a broader ecological balance. Although predator-based control is not a standalone solution, it illustrates how biotic interactions can be incorporated into integrated management frameworks.

The comparison between Belgium and the Netherlands highlights differences in management approaches, governance structures, and implementation pathways, while also revealing common challenges. In both countries, successful management increasingly depends on collaboration between water managers, conservation agencies, researchers, and local stakeholders, as well as on aligning invasive species management with broader ecological restoration objectives.

Recent experiences underline the need to move from species-focused control towards area-based and ecosystem-oriented management. By combining prevention, targeted intervention, habitat restoration, water quality improvement, and the reinforcement of natural ecological processes, management efforts can contribute not only to reducing crayfish impacts but also to enhancing the overall ecological condition of freshwater systems. These lessons provide valuable perspectives for the future development of invasive crayfish management across northwestern Europe.

Keywords

alien invasive crayfish, management, trapping, biocontrol, integrated approach

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Conflicts of interest

The authors have declared that no competing interests exist.