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**21ST INTERNATIONAL CONFERENCE
ON AQUATIC INVASIVE SPECIES**

The background of the top half of the cover is a photograph of a city skyline, likely Montreal, with several tall skyscrapers. The buildings are reflected in a body of water in the foreground. A grassy bank is visible on the left side. A semi-transparent geometric pattern of overlapping squares is overlaid on the image.

**AQUATIC INVASIONS
IN THE ANTHROPOCENE**

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**PROGRAM
AND ABSTRACTS**

Conference Secretariat



**Invasive
Species
Centre**

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Session D1: Emerging Vectors, Pathways and Invasion Threats

Risks and Management of Invasive Alien Crayfish Species in the Rhine-Meuse River Delta

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Since the 1950s, ten alien crayfish species have been introduced in the Rhine-Meuse river delta. Eight species originate from North America, one from South-east Europe and one from Asia. Currently, at least six species have well established populations.

Recently, five species have been listed as invasive alien species of European Union concern (i.e. *Faxonius limosus*, *Faxonius virilis*, *Pacifastacus leniusculus*, *Procambarus clarkii* and *Procambarus fallax f. virginalis*). All crayfish species of EU concern are subject to restrictions on keeping, transportation, importing, selling and breeding. Member States are required to take action on pathways of unintentional introduction, to take measures for early detection and rapid eradication of these species, and to manage species that are already widely spread in their territory. The impact of these species on biodiversity, water quality and functioning of ecosystems mainly results from predation on macroinvertebrates, amphibians and fish and from fragmentation and consumption of aquatic macrophytes. Moreover, burrowing activities of some species cause bank instability, increase risk of dyke breaches in peatland areas and result in higher sedimentation rates in ditches and canals.

The introduction of Northern American crayfish species is also associated with the spread of the crayfish plague (*Aphanomyces astaci*). This disease caused, in addition to water pollution and habitat destruction, a rapid decline of the critically endangered European crayfish (*Astacus astacus*). Moreover, the presence of infested alien species limits the success of restocking programmes of native crayfish.

Our presentation will focus on pathways for introduction, spread, dispersal rates, climate match, establishment and environmental impacts of invasive alien crayfish in the Rhine-Meuse river delta. Threshold densities for significant adverse effects and scenarios for cost-effective management of invasive crayfish species will be discussed with special attention to options for enhancing ecosystem resilience.

Tackling Unintentional Pathways of Introduction and Spread of Invasive Alien Freshwater Species in Belgium

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In Belgium, competences with regards to IAS are scattered across the regions (Flanders, Wallonia and Brussels Capital Region) and the federal level. To support the implementation of the EU IAS Regulation (1143/2014), a cooperation agreement was set up. This agreement provides the legal basis for several new entities: the National Scientific Secretariat on IAS which coordinates scientific activities, the National Scientific Council on IAS as an advisory body and the National Committee on IAS which finalizes decisions and prepares policies. These three entities worked together to prioritize pathways of unintentional introduction and spread of the IAS of Union concern and to draft action plans for priority pathways. First, a complete pathway inventory was set up. Second, the relevance of the pathways for the country was scored. A prioritization protocol was then applied, taking into account species impact, establishment potential and the frequency of introduction.

For the freshwater species, three pathways related to freshwater recreation were identified: transportation via angling equipment, hitchhiking on boats and fish stocking. Additionally, hitchhiking on machinery and disposal of aquatic species in the environment by private individuals, were also identified as important pathways. With consultation of administrations, sectors and stakeholders to ensure support for action plans and assess feasibility, we identified potential actions to tackle these "freshwater" pathways. These included measures in broad categories: legislative action, biosecurity, inspection, awareness raising and research. The exercise showed: the need for baseline data on anglers and boaters habits, knowledge and attitude towards IAS, the difference in biosecurity in fish stocking between the regions, the absence of a mechanism in the tenures of maintenance companies to decrease the spread of IAS, and the need for awareness raising targeting pond owners and aquarists' communities. Future work will focus on the drafting of concrete action plans to tackle freshwater invasion pathways.