Risk analysis of non-native aquatic species – the challenge of assessing and predicting invasiveness potential across geographical and linguistic expanses

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Adapted from probabilistic risk assessment protocols developed for the nuclear power industry in the 1970s, risk analysis of non-native species aims to identify and prioritise potentially invasive species for comprehensive assessment to communicate risks to stakeholders and the public and to inform policy, legislation and management decisions to mitigate adverse impacts and native species, ecosystem and the socio-economic services they provide. A major challenge posed by the increasing frequency and diversity of transport vectors along a greater number of pathways is the prediction of which species are likely to become invasive, where, and when – in the present and in the future. Electronic decision-support tools, statistical models and decision-tree approaches continue to be developed to address this challenge, but their probability of success is limited by several factors, foremost amongst these are the propensity of introduced species to defy predictions and to adapt (or fail to adapt) to new locations, and the uncertainty surrounding future climate conditions. A compounding factor in the risk analysis process is the linguistic uncertainty associated with the assessment process, both within and between languages, due to the cultural landscape behind language usage.

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