Supplementary Text 2

A few prominent examples of missed opportunity for earlier management from the literature include: *(i)* zebra mussel *Dreissena polymorpha* in water bodies, where biosecurity and spread prevention clearly suffered from underinvestment, despite the known difficulties involved in eradication and the extensive infrastructural damages caused (Leung et al., 2002); *(ii)* control of brown tree snakes *Boiga irregularis*, which affect power supplies, native biodiversity and, while an initial lack of preventative measures has caused these significant ongoing costs on the island of Guam (Pacific Ocean), it has promoted strong biosecurity measures and earlier management elsewhere (e.g. Hawaii; Burnett et al., 2012); *(iii)* management of submerged water-weeds (e.g. curly water-weed *Lagarosiphon major*) that block waterways, propagate from small fragments, spread rapidly and have limited post-invasion management options (Hussner et al., 2017).

An efficacious example of pre-invasion management is the regulation of the international shipping industry in the Laurentian Great Lakes (North America). Shipping has been distinguished as a primary vector for the spread of aquatic species globally, with aliens arriving to aquatic systems primarily through ballast water and sediment (Ricciardi, 2006; Briski et al., 2013, 2015; Lin et al., 2020). To prevent new introduction of species to the Great Lakes, Canada and the US have enacted two different ballast water regulations. First, mid-ocean exchange was optional in 1989 and became mandatory in 1993 to reduce the number of propagules in ballast water (Canadian Coast Guard, 1989; United States Coast Guard, 1993). Second, this regulation was further enhanced by including the management of residual ballast water and accumulated sediments through mandatory saltwater flushing, beginning in 2006 (Government of Canada, 2006; SLSDC, 2008). In parallel to the shipping management implementations, the number of new invasions decreased (Ricciardi, 2006; Sturtevant et al., 2019). Out of 188 invaders established in the last 150 years, with an average

of two new aliens discovered per year until 2006, the rate of new invasions has fallen to only 0.25 species per year after 2006 (Ricciardi, 2006; Sturtevant et al., 2019). Notably, 21 species were introduced between 1993 and 2006, but only three in the last decade (Sturtevant et al., 2019). However, whereas the substantial costs of implementing ballast water management systems have been predicted under different scenarios (Wang and Corbett, 2020; Wang et al., 2021), costs are rarely reported as actually observed due to the large numbers of ships and companies from which data would be required.

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