

### Alien species flourish on fisheries all over the world!

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Due to worldwide fisheries activities alien invasive species are known to be successful and flourishing over the blue globe. To support the management of alien species the Dutch government has commissioned a review study focusing on alien species in relation to commercial and recreational fisheries including aquaculture, in inland, coastal and offshore waters. The main fisheries related alien (non-native) species risks that were identified on a worldwide scale, were evaluated on a more detailed level for The Netherlands. The governmental Office of Risk Assessment and Research then made a risk assessment based on literature and expert judgement. As an obvious conclusion it was stated that fisheries worldwide should take responsibility for minimising the risks of facilitating introductions and spread of alien species. This can for example be done by pathway management and risk assessments prior to new introductions or restocking of fish. This presentation will show alien species that have been aided in their invasion success by various fisheries activities, whereby the results of this study can be used to make suggestions on measures that can be taken to limit the further introduction and spread of these species.

### Risks of alien sturgeon species in the River Rhine basin for the reintroduction success of the endangered native European sturgeon

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Sturgeons (order *Acipenseriformes*: sturgeons and paddlefishes) are amongst the most endangered fish in the World. The dwindling status of the wild populations, however, stands in stark contrast to the thriving status of sturgeons in cultivation. Sturgeons are used to produce caviar, meat, and live fish for the exotic pet trade. Through escapees and unwanted releases alien sturgeons are introduced outside their natural ranges, where they may impact the environment and vulnerable native sturgeon populations. Here we present an in-depth inventory of alien sturgeon species in the river's Rhine and Meuse delta and assess the risks for the native biodiversity, in light of reintroducing the European sturgeon. We based our study on (a) a 2021 inventory of farms, wholesalers, importers, and retailers (e.g., garden centers, pet shops), and consumers; (b) reports on spread of alien sturgeons (>3,000) obtained from anglers' logbooks, biodiversity databases, dive websites and social media; (c) a literature study on hybridisation and competition between sturgeon species; and (d) an environmental risk assessment using the Harmonia+-protocol. In total, eleven alien *Acipenseriformes* have been recorded in the Rhine-Meuse delta. Although most (c. 2000) sturgeons were reported from angling ponds, more than 500 other sturgeons were found in 61 other lakes and ponds. In addition, c. 300 alien sturgeons occurred in hydrologically connected waters. Even though the alien sturgeon survival is promising for the reintroduction of European sturgeon, because of the potential hybridization hazard, competition, and transmission of parasites and diseases, strategies for their removal and prevention of further spread are discussed.