Marine Board-European Science Foundation
Response to European Commission Consultation
Invasive Alien Species (IAS) – A European Concern

Invasive Alien Species (IAS) in the marine environment are a global problem that can only be countered effectively at the global and regional level. Shipping is by far the dominating transportation means in global trade; in the ballast water (Anon., 1996) and on the surfaces of ships (Gollasch, 2002), alien species are transported outside their natural bounds. Escapees of non-native aquaculture species and additional (unintended) introduction of species as a consequence of aquaculture activities has led to a substantial number of established aquatic IAS in Europe (Minchin *et al.*, 2005). Aquarium trade and trade with live seafood are other vectors that enable IAS to overcome natural barriers (Minchin *et al.*, op. cit.). Whether accidentally or deliberately introduced in the marine environment, IAS have transformed coastal marine habitats around the world and once introduced they are almost impossible to eliminate (Thresher and Kuris, 2004).

The marine environment is well suited for dispersal. This is especially true for those species living in the water column itself, but also bottom dwellers may release propagating units into the water, which then disperse widely with the water currents. The marine environment is relatively poorly monitored, hence the probability for discovering an alien species before it has established a permanent population is small (Ruiz and Carlton, 2003). While only a small fraction of the marine species introduced outside of their native range are able to thrive and invade new habitats (Mack *et al.*, 2000), their impacts can be dramatic (Molnar *et al*., 2008).

According to a recent study by Molnar *et al.* (2008), only 16% of marine eco-regions in the world have no reported marine invasions and even that figure may be inflated due to under-reporting. Using a global database of 329 marine invasive species, these authors indicate high levels of invasions recorded in amongst others the North Sea (with 73 invasive species of which 64% are considered harmful), the Levantine Sea in the eastern Mediterranean (with 72 invasive species of which 50% are considered harmful) and the temperate Northern Atlantic (240 invasive species of which 57% are considered harmful).

At the global level, the threat of IAS to biodiversity and society has been recognized and addressed to some extent, amongst others by the Convention on Biological Diversity (CBD) and the International Maritime Organisation (IMO). The CBD obliges Parties to the Convention to 'prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species' and adopted 15 Guiding Principles for the prevention, introduction and mitigation of impacts of alien species that threaten the ecosystems, habitats

and species[1]. To protect the marine environment from IAS, IMO adopted the 'International Convention for the Control and Management of Ships' Ballast water and Sediments'[2].
Because it is difficult to predict **what** a species will do when arriving in a new location, **who** the next invader will be, and **where** the next invasion will take place (Carlton, 2005), it is important to understand and manage the vectors - the mechanisms for introducing alien species. It is also generally recognized that the most cost-effective way to combat Invasive Alien Species (IAS) is to prevent them from being introduced.

Recommendations:

- European countries should be urged to ratify and build capacity to meet the requirements of the International Convention for the Control and Management of Ships' Ballast Water and Sediments.
- European countries should be encouraged to apply voluntarily or eventually to support, the development of mandatory instruments to minimize the risk of IAS from hull fouling. This could be facilitated through support to the UK , Australian and New Zealand initiatives in IMO, and employing the ICES Code of Best Practice for the Prevention of Hull Fouling under development.
- To tackle the role of aquaculture operations in marine invasions, stricter, industry-wide control measures should be developed and legal and enforcement structures strengthened to restrict intentional and accidental introductions of harmful species.
- There is a need to increase research to better predict invasions. Such research may address: increasing the knowledge about vectors, the inherent factors in the European marine ecosystems that may prevent IAS, and those that facilitate them.
- As underlined by the Convention on Biological Diversity (CBD)[3], there is a need for the 'compilation and dissemination of information on alien species that threaten ecosystems, habitats, or species, to be used in the context of any prevention, introduction and mitigation activities'.
- Detecting IAS depends on available taxonomic expertise and establishment and maintenance of relevant databases at the local, regional and global level. These need to be promoted.
- There is a need to establish a global database of marine IAS containing information on the threat-level and introduction pathways.
- Developing effective prevention strategies requires global information, but most datasets are local or regional. The validity of a global database and analyses depends on the quality of the underpinning regional information-systems. Efficient interaction between global information (mainly focusing on distribution and dimensions) and

[1] Agreed at the COP 6 in 2002 (The Hague, the Netherlands) and annexed to COP Decission VI/23 (Alien species that threaten ecosystems, habitats or species).

[2] http://globallast.imo.org

[3] Convention on Biological Diversity. 2000. Alien species that threaten ecosystems, habitats or species, as adopted by Conference of the Parties 5 Decision V/8.

regional and local observations (mainly focusing on diversity, impact and response of ecosystems) is essential.

- There is a need to develop capacity for rapid response (to control or eradicate) newly discovered invasions.
- There is a need to provide states and regions with the tools and funding for effective protection, control and eradication of IAS.
- There is some disparities in information resources on marine invasive species, in particular, there is under-reporting of both microorganisms and low-impact invasive species that needs to be addressed.

Literature cited

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