

# Descriptor 2 of the Marine Strategy Framework Directive: ten suggestions to move forward

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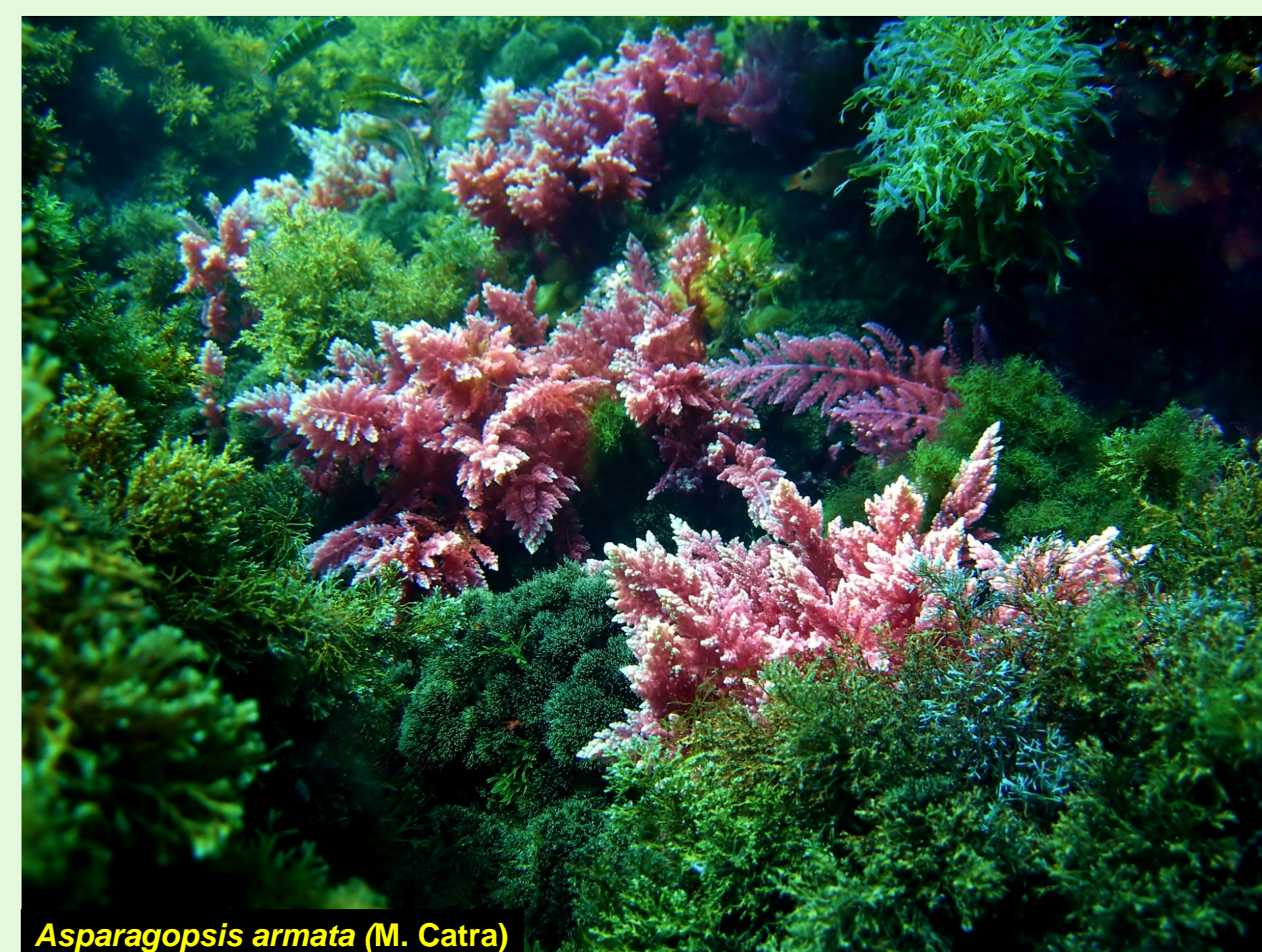
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*Dreissena polymorpha* (D. Minchin)



*Rhopilema nomadica* (IOLR)



*Asparagopsis armata* (M. Catra)

## Introduction

EC Decision (2010/477/EU) states for the **Descriptor 2** “Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystem” the following:

The identification and assessment of pathways and vectors of spreading of non-indigenous species as a result of human activities is a prerequisite to prevent that such species introduced as a result of human activities reach levels that adversely affect the ecosystems and to mitigate any impacts. The initial assessment has to take into account that some introductions due to human activities are already regulated at Union level to assess and minimise their possible impact on aquatic ecosystems and that some non-indigenous species have commonly been used in aquaculture for a long time and are already subject to specific permit treatment within the existing Regulations. There is still only limited knowledge about the effects of the non-indigenous species on the environment. Additional scientific and technical development is required for developing potentially useful indicators, especially of impacts of invasive non-indigenous species (such as bio-pollution indexes), which remain the main concern for achieving good environmental status. The priority in relation to assessment and monitoring relates to state characterisation, which is a prerequisite for assessment of the magnitude of impacts but does not determine in itself the achievement of good environmental status for this descriptor.

The two criteria for assessing progress towards good environmental status were defined as:

2.1. Abundance and state characterisation of non-indigenous species, in particular invasive species

— Trends in abundance, temporal occurrence and spatial distribution in the wild of non-indigenous species, particularly invasive non-indigenous species, notably in risk areas, in relation to the main vectors and pathways of spreading of such species (2.1.1)

2.2. Environmental impact of invasive non-indigenous species

— Ratio between invasive non-indigenous species and native species in some well studied taxonomic groups (e.g. fish, macroalgae, molluscs) that may provide a measure of change in species composition (e.g. further to the displacement of native species) (2.2.1)

— Impacts of non-indigenous invasive species at the level of species, habitats and ecosystem, where feasible (2.2.2).



*Didemnum vexillum* (D. Offer)



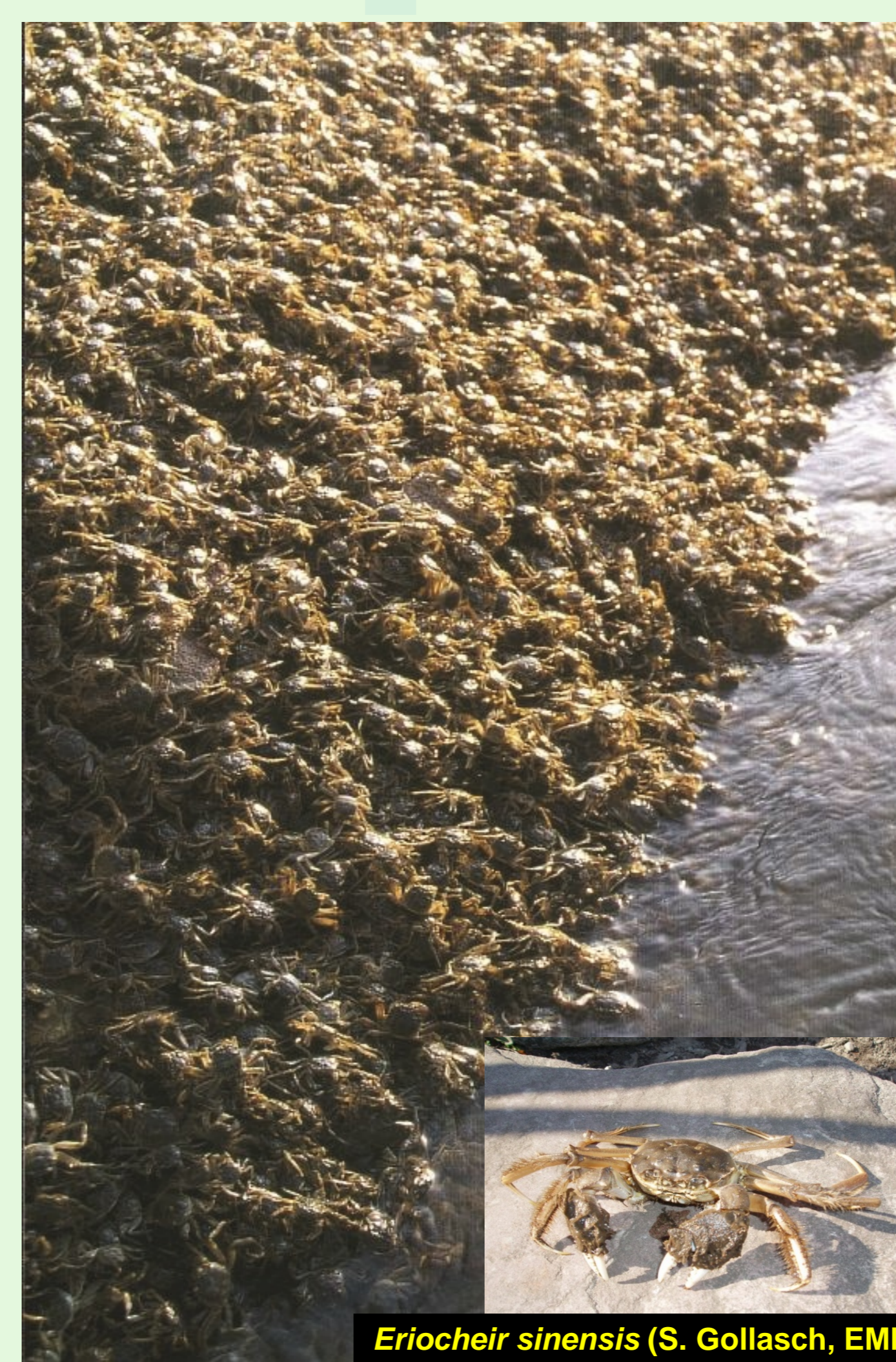
*Neogobius melanostomus* (EMI)



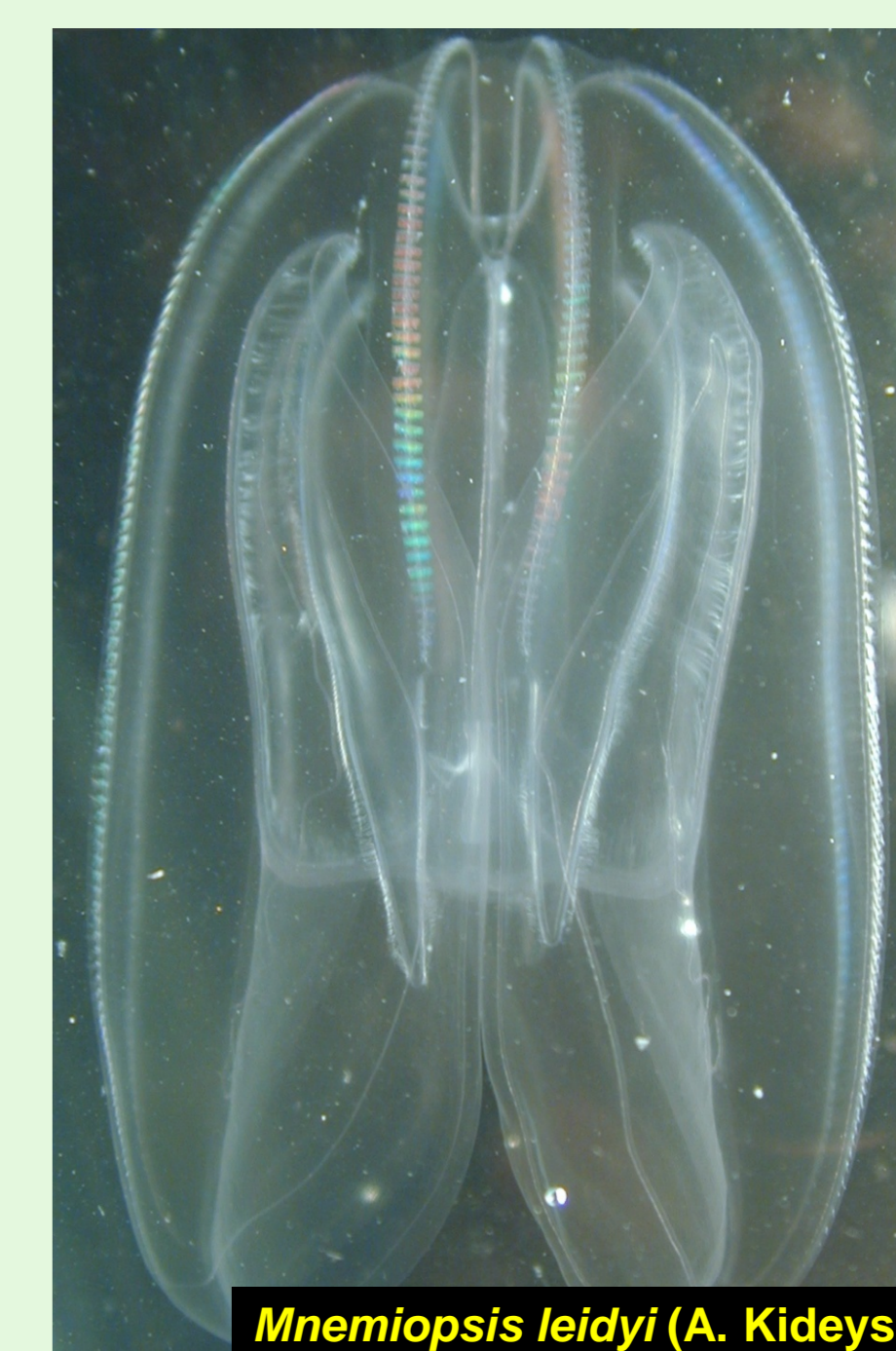
*Crassostrea gigas* (D. Minchin, S. Gollasch)



*Caulerpa racemosa* (M. Cormaci)



*Eriocheir sinensis* (S. Gollasch, EMI)



*Mnemiopsis leidyi* (A. Kideys)



*Chromodromis annulata* (Oz Rittner)

The following generic points should be considered when addressing this descriptor:

1. Availability of taxonomic expertise is critical;
2. Evaluation of the numbers of NIS, their spread and impact need to be standardized;
3. Evaluation of the newly arrived NIS may start with selected well studied taxonomic groups;
4. Ratio of NIS/NS (native species) in a region or habitat is to be calculated and evaluated based on contemporary reliable data;
5. Ratios (NIS/NS) and NIS impacts may vary with habitat, region, and presence of other drivers, and so could be independent of NIS management actions;
6. NIS with lesser recognized impact may be evaluated separately;
7. NIS inventories should be accompanied by pathways and vectors analyses;
8. Selected areas (hot-spots) could be used in monitoring to improve cost-effectiveness;
9. Management options should be agreed by neighboring countries because of the risk of secondary spread of NIS, as appropriate;
10. NIS with known impact(s) are to be managed as is practicable and on the basis of this the success of managements effort should be evaluated.

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