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In the Wadden Sea the invasive Pacific oyster (*Crassostrea gigas*) is about to transform intertidal mussel beds of the native blue mussel (*Mytilus edulis*) into oyster reefs.

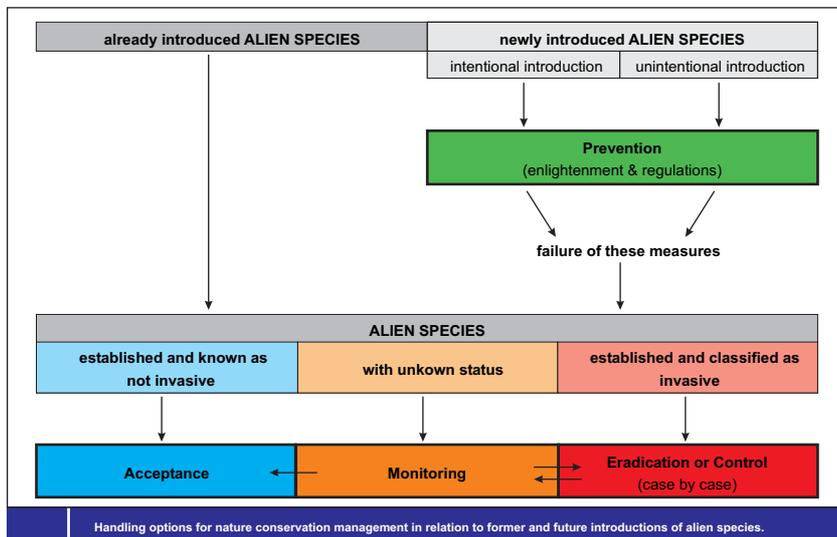
Convention on Biological Diversity

# Management strategies for alien species in the Wadden Sea

Alien species, intentionally or accidentally transported and released by man into a habitat outside their native geographical range, are one of the critical elements in today's economic globalization. Special attention is directed to such alien species that threaten ecosystems, habitats or species (= invasive alien species sensu CBD 1992).

Within the Wadden Sea about 52 alien species occur of which several have already altered the habitat or have sustain lasting effects on native biota. There is no indication that these alien species will ever leave Europe again. And, it is highly probable that in the near future new alien species will arrive in our waters. However, up to now a purposeful management strategy in dealing with the phenomom in regard to the protection and conservation of the Wadden Sea is missing.

Depending on the species, efforts should target on one of the four categories: (a) acceptance; (b) prevention; (c) monitoring; and (d) eradication or control.



## Acceptance

Many alien species, which are already introduced and established, are innocuous and have no relevant ecological or economic effects. These species should be accepted as new components of our native flora and fauna.

## Prevention

Since it is well known that eradication of an introduced species, once it has become established in the marine environment, will be very expensive, or even impossible, the prevention of introductions through enlightenment and regulations is the first and most cost-effective option. Existing instruments (e.g. IMO ballast water convention, CITES) should be used strictly, effective new instruments (e.g. against hull fouling) have to be developed.

## Monitoring

The development of effective monitoring programmes is necessary to aid the early detection and determination of the status of newly introduced alien species. Monitoring is an important basis for the assessment of impacts and the invasiveness of alien species and essential for taking rapid measures of eradication and control especially of newly observed invasive species.

## Eradication or Control

Where an alien species has become invasive, eradication or control are effective actions to prevent its spread and to minimize impacts. The best chance for a successful eradication of most unwanted species is during the early phase of invasion, while the target populations are small and/or limited to a small area.

## Recommendation:

Every alien species has the potential of unwanted and uncontrollable consequences and the introduction as well as the spreading of aliens should be minimized wherever possible.

Thus, the development of an alien species plan including an effective monitoring programme on the level of the Trilateral Cooperation on the Protection of the Wadden Sea is absolutely essential.

*Excerpt from*

Stefan Nehring & Frank Klingenstein (in press):

## **Alien species in the Wadden Sea - A challenge to act.**

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(...) The impacts of alien species are often immense, insidious, and usually irreversible, and can have enormous economic and human health consequences. Viewed on a global basis, alien species are one of the key threats to native species and ecosystems and other aspects of biodiversity.

(...) The worldwide implications of alien species have been identified by non-governmental and governmental organizations alike as well as being emphasized in numerous international conventions and other instruments. (...) These range from legally binding treaties to non-binding technical guidance focused on particular pathways to prevent the introduction of alien species. Most instruments are specific to a sector, taxonomic group, type of environment or type of harm (for review see SCBD 2001).

At global level the only instrument that covers all aspects of invasive alien species as they relate to biodiversity, is the Convention on Biological Diversity (CBD), which was adopted in 1992 and entered into force in 1993. Its aims are the conservation of biological diversity, the sustainable usage of biological resources, and the fair and equitable sharing of benefits arising from the use of genetic resources. Article 8h of the CBD requires all Contracting Parties "as far as possible and as appropriate, to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species". This statement was specified by the decision VI/23 "Guiding Principles on Invasive Alien Species" by the 6th Conference of the parties to the CBD in 2002. Its adoption suggests comprehensive national strategies on the basis of a hierarchical approach (prevention, early detection, measures).

(...) In the highly protected Wadden Sea a multitude of alien species have established permanent populations, at least six of them are of invasive nature. Up to now no management plan exists in which way the preservation or restoration of the Wadden Sea ecosystem in relation to alien species could be guaranteed. Even in the common package of TMAP parameters alien species have not been integrated as a specific investigation criterion yet. At the present time, most analyses that evaluate patterns of aquatic invasion or test specific hypotheses derive data from existing literature, which is extremely uneven in space and time. Thus, the development of an alien species plan on the level of the Trilateral Cooperation on the Protection of the Wadden Sea is absolutely essential.

CBD, 1992. The Convention on Biological Diversity. UN Conference on Environment and Development, Rio de Janeiro, [www.biodiv.org](http://www.biodiv.org)

SCBD, 2001. Review of the efficiency and efficacy of existing legal instruments applicable to invasive alien species. Secretariat of the Convention on Biological Diversity Montreal, CBD Technical Series No. 2, 31 pp.