



# Invasive Alien Species in the freshwater environment: links with the Water Framework Directive (WFD)

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Centre

# The EU Water Framework Directive

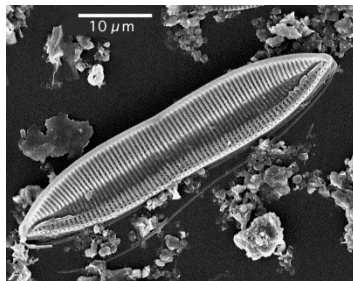
Protecting all surface and groundwater, including transitional and coastal waters

Covering all pressures and impacts

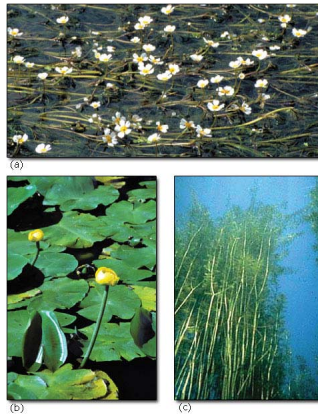
Water management at river basin level



# WFD goal: “Good Ecological Status” – assessed using biological indicators



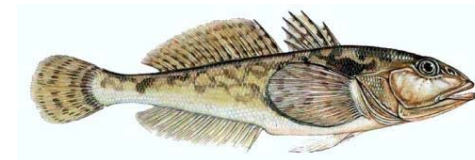
**BENTHIC  
FLORA**



**MACROPHYTES**



**BENTHIC  
FAUNA**



**FISH**



# Alien Species on the agenda of the WFD Common Implementation Strategy

ECOSTAT Workshops in 2006, 2008, 2009

Publications in *Management of Biological Invasions*, 2008,2013

Questionnaire, 2009, updated and expanded in 2019

Publication in *Biological Invasions*, 2020

<http://dx.doi.org/10.3391/ai.2008.3.4.1>



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Research Article

## Incorporating invasive alien species into ecological assessment in the context of the Water Framework Directive

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### Abstract

The Water Framework Directive (WFD) is currently the principal document covering the management of inland, transitional and coastal waters in the EU. The current approach to its implementation regarding ecological assessment using biological elements is to develop assessment systems tailored to detect a response to a specific pressure. Although the WFD does not specifically mention invasive alien species (IAS) discussion has commenced on how to incorporate them into ecological assessment owing to their ability to significantly alter the structure and functioning of aquatic ecosystems. A potential framework is presented whereby IAS are treated as both a pressure and as part of a biological element to be monitored. It is proposed that the densities and distribution of IAS in water bodies are matched to normative definitions for quality classes in the WFD by expert groups at EU level. This would allow a rapid and consistent assignment of ecological status on the basis of IAS abundance and distribution in a water body. Such assessment should deal with IAS separately from other pressures. This would allow a separate report of the ecological degradation resulting from IAS so that specific management measures may be designed.

**Key words:** invasive alien species, Water Framework Directive, ecological assessment

<http://dx.doi.org/10.3391/mbi.2013.4.1.04>



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Research Article

## Is there a need for a more explicit accounting of invasive alien species under the Water Framework Directive?

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### Abstract

Through ratification of the Water Framework Directive (WFD), EU Member States committed themselves to a pressure-based assessment of the ecological status of their water bodies. Invasive alien species (IAS) constitute a major pressure in many aquatic ecosystems, yet are not explicitly accounted for by the majority of WFD assessment methods. Most Member States argue that no explicit assessment of IAS is required, assuming that significant IAS pressures will affect the WFD biological quality elements (BQEs), and be detected by generic WFD status assessments. We tested this assumption for a selection of country-by-surface-water category combinations, covering nearly 40,000 water bodies. For each of the combinations, the pressure by high-impact IAS is higher in water bodies with ecological status varying from bad to moderate than in water bodies in good or high ecological status. Most high-impact IAS show strong associations with low status class categories. Of the 17 most frequently occurring high-impact IAS, only *Mustela vison* (Schreber, 1777) and *Potamopyrgus antipodarum* (Gray, 1853) are disproportionately frequent in high status water bodies. The sensitivity of WFD methods varies across BQEs, with macrophyte-based methods showing a consistently high sensitivity to IAS pressures. However, significant pressures are observed in a




<https://doi.org/10.1007/s10530-020-02201-z>

Biol Invasions (2020) 22:1497–1512  
<https://doi.org/10.1007/s10530-020-02201-z>



ORIGINAL PAPER

## Alien species and the EU Water Framework Directive: a comparative assessment of European approaches

Philip J. Boon  · Stacey A. Clarke  · Gordon H. Copp 

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**Abstract** Although the European Water Framework Directive (WFD) does not refer explicitly to alien

considered non-native biogeographically. All countries have developed lists of AS, but those specific for

# Questionnaire – five broad areas

1. Clarification of the scope of work on alien species (AS) and the WFD
2. Compiling lists of AS for use with the WFD
3. Monitoring AS
4. Use of data on AS for risk assessment of water bodies and for classifying WFD ecological status
5. AS and WFD river basin management plans



## Questionnaire response

Belgium (Flanders)	Lithuania
Croatia	Norway
Czech Republic	Poland
Denmark	Portugal
Estonia	Slovakia
Hungary	Spain
Ireland	Sweden
Italy	Turkey
Latvia	UK

# Results (1) – general scope for AS in WFD

- Definitions:
  - Most countries use the IUCN definition: “A species, subspecies, or lower taxon introduced outside its normal past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce.”
  - 11 of the 18 contributing countries include ‘translocated native species’ in their definition of AS; All countries include ‘casual species’ in their AS definition
  - Two-thirds of the countries do not consider as AS those that have expanded their range as a result of climate change
  - Wide range of views on whether there should be historical dates for deciding whether a species should be considered alien

## Results (2) - Compiling species lists for the WFD

Lists of AS specifically prepared for WFD assessments only available in the UK and Republic of Ireland

Many countries do not restrict their consideration only to invasive AS (e.g. Croatia, Hungary, Norway, the UK)

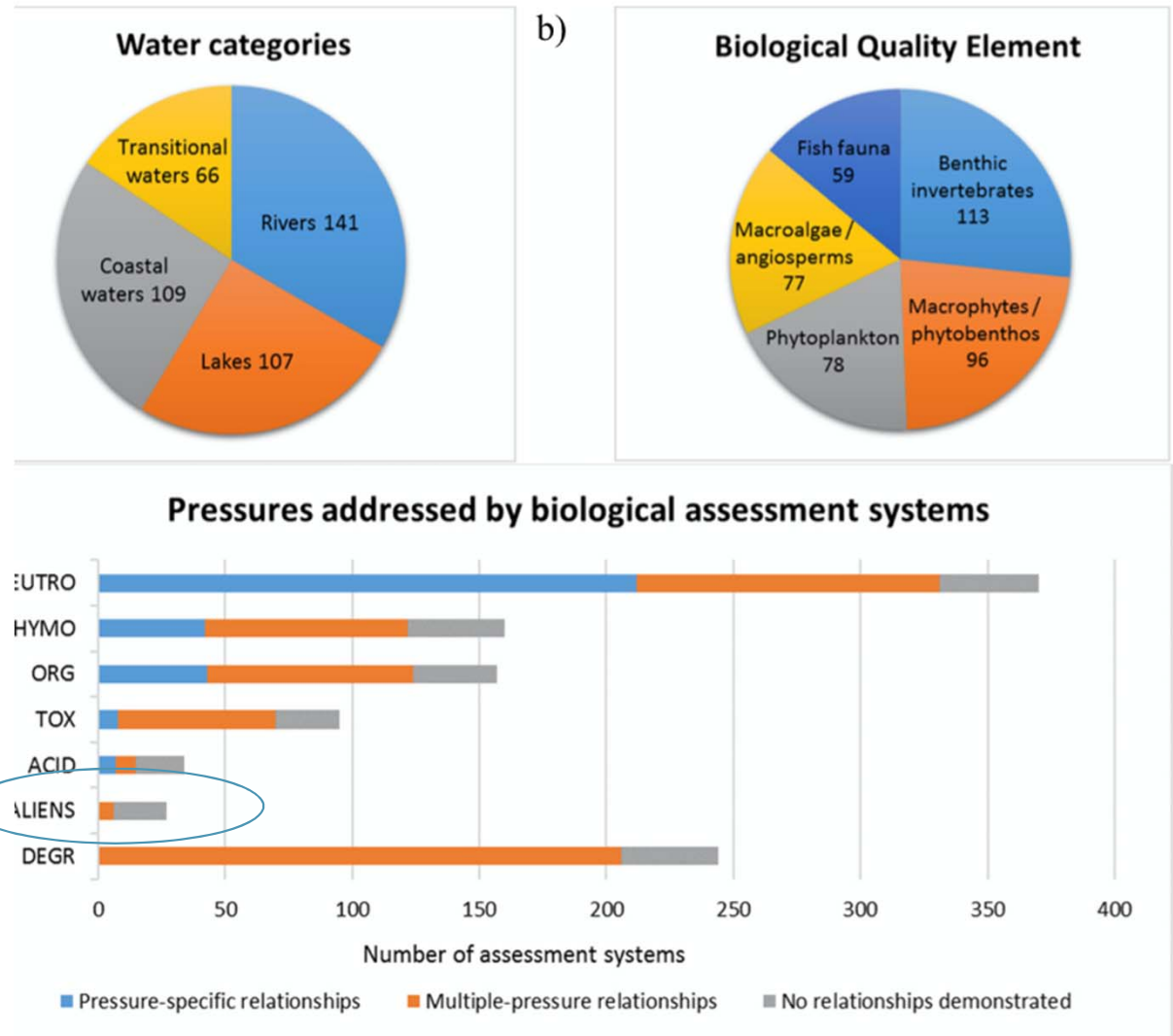
In Ecoregion 18 (GB), lists are continually updated for all aquatic and riparian AS according to their degree of impact ('high', 'moderate', 'low', 'unknown'), based on formal risk assessments.

## Results (3) – Monitoring of AS for the WFD

- Few countries have comprehensive monitoring programmes specifically designed to detect AS or their spread, and they rely instead on data collected from broader monitoring programmes
- Countries that do specifically monitor AS include Belgium, Czech Republic, Estonia, Hungary, Lithuania, Spain and the UK
- A few countries (e.g. Belgium, Croatia, Denmark, Estonia, Italy) have set up monitoring programmes to meet the requirements of the EU Regulation on invasive alien species

- Few WFD assessment methods address alien species
- Specific pressure-impact relationships lacking

Poikane et al., 2020: European aquatic ecological assessment methods: A critical review of their sensitivity to key pressures



## Results (4): AS and classification of ecological status

### Different approaches used

- Most countries assume that the classification tools will already have responded to the impacts of AS [recognising that this assumption is likely to be problematic]
- Some countries modify the classification based on the presence or abundance of AS
- Some countries remove AS assessments from classification altogether and report the results separately

## Results (5) – AS in WFD programmes of measures

- extent of any ameliorative action is extremely limited and patchy
- most common responses: sending reports to authorities, adding records to databases, and further monitoring of the species detected
- Few specific actions that attempt to manage, control or eradicate AS.

## Conclusion: A need for greater consistency

- River Basin Management Plans are our management framework to address the effects of all pressures including from AS
- The effectiveness of the WFD in achieving GES in rivers, lakes and transitional waters will be reduced without a greater consistency in dealing with the pressures from AS:
- Need to maximize the links between the WFD, MSFD, Habitats Directive and EU Regulation on invasive species



# Thank you



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