

Methods for controlling or eradicating aquatic invasive species

BACKGROUND

Since the adoption of the EC Water Framework Directive (WFD), much work has been carried out on the impact of alien invasive species on the ecological status of surface waters. The WFD 'programmes of measures' provide a mechanism for improving the state of the aquatic environment and for tackling the ecological and economic problems caused by invasive species. Programmes of measures need to include early and urgent action on new invasions, identifying and controlling external sources of potential recolonization, as well as long-term management using appropriate tools and techniques.

This report covers control measures for 13 high or moderate impact, and one 'alarm' species on the UKTAG list that were not covered by the Aldridge report for Natural England. It draws information from published and unpublished literature, listed best practices, technical reports, unpublished reports, project websites and expert knowledge. For each species, a report was written to present essential background information about the ecology and biology of the species. This is followed by a list of invasion pathways and known techniques to limit further spread. The third section lists successful control measures that encompass biological, chemical, physical and environmental approaches. A final section on further research acts to identify potential knowledge gaps.

RECOMMENDATIONS :

- *Azolla filiculoides*: Physical removal with weed buckets/fine nets. Biocontrol with *Stenopelmus rufinus* weevils or chemical control with glyphosate requires approval.
- *Myriophyllum aquaticum*: Repeated cutting/pulling (if plant fragments contained); floating plastic covers. Biocontrol with grass carp and chemical control with glyphosate requires approval.
- *Lagarosiphon major*: Benthic matting; physical removal.
- *Elodea canadensis*: Floating plastic covers or dyes to create shade. Biocontrol with grass carp requires approval.
- *Elodea nuttallii*: Repeated cutting; benthic matting
- *Spartina anglica*: A combination of cutting, smothering and/or glyphosate although approval is required for the latter. Control measures are only required if the species is considered locally problematic.
- *Cabomba caroliniana*: Repeated cutting; benthic matting; floating plastic covers
- *Hemimysis anomala* and *Eriocheir sinensis*: There are no control measures currently available.
- *Crepidula fornicata*: Dredging/manual collection; smothering with sediment.
- *Styela clava*: Manual collection; plastic wrapping; acetic/lime/saline sprays or immersions for aquaculture stocks.
- *Urosalpinx cinerea*: Dredging/manual collection with or without tile traps.
- *Didemnum vexillum*: Sprays/immersions; manual cleaning; air exposure, smothering with sediment or plastic wrapping.
- *Ocenebra inornata*: Manual collection.

RESEARCH TEAM

Jenni A. Stockan and Debbie Fielding: The James Hutton Institute, Craigiebuckler, Aberdeen, AB15 8QH, Scotland

