



# Aquatic and riparian plant management – controls for vegetation in watercourses

## Project Summary SC120008

A team of scientists from the Environment Agency, the Centre for Ecology and Hydrology, JBA Consulting and Penny Anderson Associates have produced updated guidance on when and how to manage vegetation growing in and near watercourses. The guidance consists of a field guide, technical guide and decision-making spreadsheet tool. A case study report and a literature review report summarise the evidence on which the new guidance is based.

The management of aquatic and riparian plants is essential to ensure the efficient functioning of many watercourses. Management needs to be cost-effective, take account of legal restrictions, and meet the objectives of the greatest number of watercourse users while minimising any negative environmental impacts.

The new guidance is intended for use in catchments where aquatic and riparian plants need to be periodically controlled or removed to achieve the watercourse's desired function. For the purposes of this guidance, 'riparian vegetation' is defined as 'the characteristic vegetation along watercourses that forms the link between the environments of water and land'.

The aim of the guidance is to provide watercourse managers in flood risk management operating authorities in England and Wales with a framework to help inform decisions on when and how to manage vegetation, taking into account both the species present and the type of watercourse.

The management of aquatic and riparian vegetation, including algae, in England and Wales is covered. The guidance does not cover the management of vegetation in lakes or ponds, but it does include canals. Nor does it include the management of riparian trees and woody vegetation or vegetation within the wider floodplain.

A number of species of aquatic and riparian plants, including both native and non-native species, can cause a range of problems, requiring different approaches to management.

The guidance splits the management of aquatic and riparian vegetation into broad species groups based on growth habit:

- submerged
- floating-leaved – free-floating and floating-leaved rooted
- emergent – tall emergent and broad-leaved
- algae

The guidance also covers three non-native invasive bank species – Japanese knotweed, giant hogweed and Himalayan balsam – because their presence can affect or restrict how other aquatic and riparian plant species are managed.

Accurate identification is crucial to distinguish plants from other, sometimes similar, species. This is because the growth form, means of spread and other ecological characteristics of a species all influence the most effective means controlling it.

For each species the technical guide provides information on:

- identification features and ecology
- key problems caused
- species-specific issues (for example, non-native invasive species, toxicity and waste disposal)
- appropriate and inappropriate control techniques

The field guide has concise species descriptions to help with identification while on site. It also contains a recording form to help with data collection in the field. Should it not be possible to identify a particular plant specifically, the technical guide also provides guidance on managing species groups based on growth habit.

Details are given on a range of management techniques in four categories – physical, chemical, environmental and biological – plus a number of emerging novel techniques. In some situations an integrated approach

using two or more techniques may be the most suitable approach.

The guidance stresses the importance of careful planning of vegetation management. To identify that a problem exists it is necessary to understand the function(s) of the watercourse and then to determine whether the extent and density of vegetation growth impairs the watercourse function(s) sufficiently for action to be necessary. The guidance explains the various considerations that need to be taken into account when planning vegetation management and presents a planning checklist to aid watercourse managers.

As part of this project a spreadsheet tool was developed to help watercourse managers choose the most appropriate aquatic and riparian plant management technique(s) for their watercourse. To determine which management technique(s) is the most suitable for a particular watercourse, the tool assesses:

- the effectiveness of possible techniques in managing the species present
- the potential impact of possible techniques on the type of watercourse
- the technical feasibility of possible techniques given the particular channel width, water depth, watercourse length and so on

The technical guide describes the use of the spreadsheet tool to support decisions on aquatic and riparian plant management at five case study sites. These were selected to cover a variety of aspects and issues including different species, watercourse types, management techniques, operating authorities and geographical locations. Short case studies from a number of other sites are used in the technical guide to illustrate specific aspects of vegetation management.

Monitoring the impacts of any management activities is important to ensure:

- management has been successful
- any repeat or follow-up treatments are appropriate
- any environmental or geomorphological impacts are identified so that the management regime can be adapted

The guidance therefore suggests a generic framework to ensure appropriate regular and routine monitoring that incorporates an adaptive management approach.

The updated guidance will help the Environment Agency, Natural Resources Wales, Internal Drainage Boards, Lead Local Flood Authorities and local authorities, and the Canal & River Trust manage aquatic and riparian plants in watercourses where they are responsible for flood risk and water level management.

The information will also be useful for other organisations that carry out aquatic and riparian vegetation management such as Natural England, wildlife trusts, rivers trusts, angling trusts and the RSPB.

Riparian landowners will also find the guidance useful, but are recommended to seek further advice from the Environment Agency, Natural Resources Wales or the

relevant IDB or LLFA before managing aquatic and riparian vegetation in watercourses on or near their land. This summary relates to information from project SC120008, reported in detail in the following output(s):

**Report:** SC120008/R1

**Title:** Aquatic and riparian plant management – controls for vegetation in watercourses. Field guide

**Report:** SC120008/R2

**Title:** Aquatic and riparian plant management – controls for vegetation in watercourses. Technical guide

**Report:** SC120008/R3

**Title:** Aquatic and riparian plant management – controls for vegetation in watercourses. Case study report

**Report:** SC120008/R4

**Title:** Aquatic and riparian plant management – controls for vegetation in watercourses. Literature review report

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**Internal Status:** Released to all regions

**External Status:** Publicly available

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