Blockage management guide

Project Summary SC110005/S

The Environment Agency has developed a new guide on the assessment and management of blockage. Drawing on the latest research and international good practice, it provides guidance on screening for blockage risk, quantifying the risk of blockage and choosing a management approach.

Why should we manage blockage?

The blockage of watercourses or structures by debris (such as man-made materials, vegetation or sediment) reduces flow capacity and raises water levels. Although well-managed blockages in the right place can reduce flood risk and restore natural processes, blockage in the wrong place can increase the risk of flooding, structural failure or embankment breach. It can also change flow patterns, causing scour and undermining structures, obstructing navigation and presenting a hazard to water users.

The appropriate management of blockage is essential to manage these risks. In recent years, environmental legislation has emphasised the need to work with natural processes, promoting a move towards more sustainable practices. The consistent economic appraisal of blockage is also necessary to allow the preparation of a business case for the full range of management measures from maintenance to capital works.

Target audience

The guide is aimed at fluvial flood risk management practitioners working in a broad range of organisations in the UK. It will be particularly useful for flood risk management asset managers, modellers, mappers and consultants. It may also be of interest to environmental non-governmental organisations, ecologists, fisheries specialists and geomorphologists.

Aims of the guide

The guide aims to help users to understand the risk of blockage on watercourses and at in-line structures, and then use this knowledge to reduce the risk of flooding, erosion and infrastructure failure. It allows readers to:

- identify sites where blockage could increase flood risk
- understand and manage that risk
- prepare a business case for management options

Scope of the guide

Screens, culverts, bridges, control gates, flap valves, flumes and weirs are covered, but not intake or outfall screens for abstraction or hydropower.

The guide covers man-made material, vegetation (including wood) and, to a lesser degree, sediment. It does not cover ice, very small material that is unlikely to cause blockage or debris flows with a high proportion of solids that are characteristic of steep slopes. The term ‘debris’ is used for simplicity and does not imply negative connotations.

Debris classification, blockage mechanisms, how to screen for a potential problems and management options are all covered within the guide. For man-made material and vegetation, the guide also covers quantitative assessment.

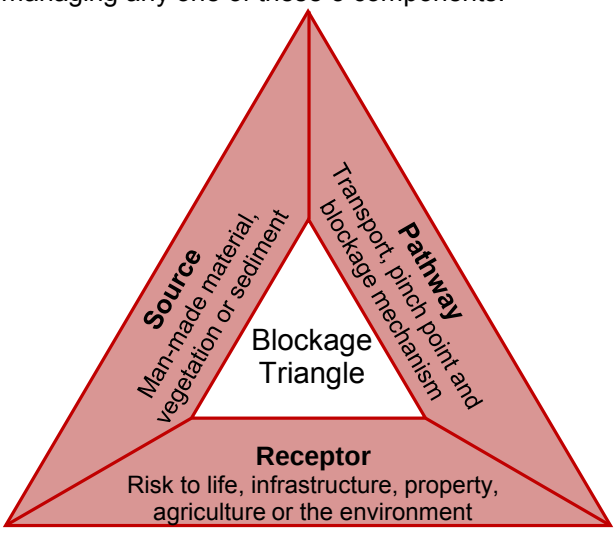
The guide draws on UK and international research and good practice guidance, using work from Ireland, Australia and the USA.

It provides more detailed guidance than the ‘Channel Management Handbook’ and is a sister document to ‘Aquatic and Riparian Plant Management’ and ‘Sediment Matters’.

What is blockage management?
For a blockage to increase flood risk, 3 components need to be present:

- a source of material with potential to cause issue
- a pathway – a pinch point where this mobile material can cause issue
- a receptor – something to receive the resulting change in flows and levels

The risk of blockage can be managed by assessing and managing any one of these 3 components.



How can I use the guide?
The guide will help you to assess and manage the blockage of watercourses and inline structures. It is split into the 4 colour-coded sections.

Blockage management process	Guidance on setting objectives (including legal requirements and stakeholder engagement), assessing risk, deciding whether to intervene, appraising options, implementation and monitoring
Management options	Guidance on choosing an approach and options for managing blockage risk including do nothing, reduce debris load, reduce probability and remove
High level screening	A high level method using readily available data to identify potential problem assets, assess risk at a known problem asset, work out what to do (if anything) at a blocked asset and prioritise routine maintenance to reduce risk
Quantitative assessment	A method to support flood risk mapping and assessment, prioritisation of inspections and incident response, design and economic appraisal

More specifically, the guide will help you to:

- get an overview of blockage risk management
- identify Water Framework Directive and legal issues affecting blockage
- identify potential blockage problems rapidly
- quantify risk and intervention benefits at a known problem asset
- represent blockage in a hydraulic model
- assess risk for asset management planning including prioritising inspections
- work out what to do at a blocked asset
- design structures to reduce the risk of blockage

Why is there uncertainty?
There is a significant shortage of blockage data internationally, which means blockage assessment remains highly uncertain. It is just not possible to calibrate or refine methods across the full range of potential scenarios. Furthermore, the availability and way materials may get into a river or stream is highly random, depending on the time of year, human behaviour, weather, and even how often the materials can get into the water, along with many others. Professional judgement is an important prerequisite for any assessment and any quantitative assessment should be accompanied by sensitivity testing.

Science report
An accompanying science report presents the evidence on which the guide is based. This includes the findings of a literature review, industry consultation and validation exercise.

This summary relates to information from project EAAA-9BGGER, reported in detail in the following output(s):

Report: SC110005/R1
Title: Blockage management guide

Report: SC110005/R2
Title: Blockage management guide – science report

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