



# River weirs – design, maintenance, modification and removal

CIRIA has published good practice guidance on the design, maintenance, modification and removal of weirs. The new guide replaces the Environment Agency's 'River weirs: Good practice guide' published in 2003.

## What is a weir?

A weir is an impounding structure in a watercourse over which water may flow and which increases water surface levels upstream over a range of flows. Weirs are also used to manage water levels for navigation, land drainage, flood risk management or flow measurement. Commercially they are used for abstraction and hydropower.

## Scope of the guide

The guide covers weirs on rivers, canals and canalised rivers, including river barrages. It does not cover dams, reservoir spillways, estuarine barrages or structures regulating natural lakes. The guide covers both the removal of weirs or, if they are serving an essential function, how to manage and/or modify them to minimise negative impacts.

## What are the issues?

Disruption to fish passage and effects on sediment transport leading to deposition and/or sediment starvation are important environmental issues. Weirs can also create a safety hazards through currents or poor access.

## Target audience

The guide is aimed at all those involved in the planning, design, construction, maintenance, modification or removal of weirs on rivers, canals and canalised rivers.

The guide provides advice for regulatory authorities and professionals such as engineers, geomorphologists and architects. It will be useful for navigation authorities, heritage bodies, weir preservation societies, abstraction licence holders, hydropower promoters, land, weir or mill owners, land agents and farmers. River and canal users, fisheries owners, angling clubs and recreation bodies such as canoe or rowing clubs will also find the guide informative.

## Structure of the guide

**Part 1 Overview** outlines the functions of weirs, their impacts and the guidance framework surrounding their management. It also covers the decision-making process as to whether a weir should be retained, modified or removed.

**Part 2 Essentials of weir management** covers setting objectives, assessing the need to intervene, the options available, how to compare options, weir design, implementation and monitoring. Part 2 emphasises the differing interests, needs and priorities of stakeholders. Often there are conflicting demands on weirs and their owners, and a weir which meets a specific functional objective may present a safety hazard and difficult rescue conditions. Likewise, a weir may be a barrier to fish migration. This part of the guide describes these potential conflicts and advises on how they can be overcome with reference to more detailed guidance in Part 3.

**Part 3 Detailed guidance** provides comprehensive technical guidance on asset management, law and policy, operational safety, the natural and historic environment, geomorphology, hydrology and hydraulics, foundations and structural design, and finally construction to support the decision-making and management processes introduced in Part 2.

## How can I use the guide?

The guide will help you to manage weirs on rivers, canals and canalised rivers. You can use it to:

- obtain an overview of weir management
- understand the potential conflicts (or synergies), taking into account the needs of different stakeholders<sup>2</sup>
- identify the legal issues affecting weirs
- plan inspections, maintenance and monitoring
- plan weir construction, modification or removal
- identify and review environmental and geomorphological issues related to weirs
- design weirs or modifications to meet hydrological and hydraulic performance requirements
- Find appropriate locations and select suitable materials

- plan weir construction

### How will the Environment Agency use this work?

The Environment Agency will use the guide in addressing the design, maintenance, modification and removal of weirs. It will also actively promote the use of the guide for the same purpose with its stakeholders, partners and suppliers.

### Research consortium and steering group

The guide was written by JBA Consulting, Mott MacDonald and FAS Heritage, with the support of a UK-wide project steering group representing a range of industry interests.

### Where to find out more

The guide is free to download from the CIRIA website:  
[www.ciria.org/weirs](http://www.ciria.org/weirs)

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