Supporting guidance for River Embankment Breaching, Lowering or Removal

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A floodplain is the area where a watercourse, floods naturally at times of high water level. The river sediment deposited on a floodplain following each flood event creates a mixture of drylands and wetlands, which support a rich and diverse range of habitats and species.

In their natural state, floodplains store and slow the flow of flood waters, helping to reduce flooding further downstream. They can also reduce the extent of sediment deposition on the river bed and prevent bank erosion by reducing the energy of the water within the river channel.

Where embankments have been built to prevent land from flooding, the floodplain is no longer able to function naturally and many or all of the above benefits are lost. The purpose of this item is to reduce the impact that embankments have on floodplains to benefit flood risk. It can be particularly useful where flooding downstream is a problem and the floodplain area available to store water is large.

This item will fund:

- removing or breaching the embankment (taking away all or part of the material that makes up the embankment to allow all or some floodwaters to reach the floodplain); or
- lowering the embankment (reducing the height of the embankment to allow some floodwaters to flow over it)

It may also possible to set-back the embankment (i.e. remove the embankment and create a new one further away from the river). However, this item will only pay for flood embankment removal and cannot fund the creation of a new embankment.

An embankment should only be removed, breached or lowered if doing so does not increase flooding to properties or infrastructure (roads, etc), upstream, downstream or on the other side of the watercourse. This will have been confirmed through the pre-works assessments described below.

Identifying the opportunity

The Scottish Environment Protection Agency, a rivers / fisheries trust or a local authority may have contacted you already identifying a site where removal, breaching or lowering of the embankment may benefit flood risk downstream.

If the local authority have contacted you, this work is likely to form part of a larger catchment project that they are progressing. Alternatively, you may be aware that your land is upstream of a flood risk area and have identified the opportunity yourself.

Where the embankment extends into a parcel of land owned by a neighbouring land manager / owner, you should seek agreement to undertake this work together with that party. In such instances, you should consider seeking the help of a facilitator.

Pre-works assessments and approvals

Certain pre-works assessments and approvals will be required prior to commencing work on the ground. These should include as a minimum:

1) Options appraisal

This assessment identifies and reviews the options to modify the embankment and evaluates their relative advantages and disadvantages. It is informed by a survey of the river reach in question. It identifies a preferred option (in consultation with the land manager and other stakeholders) and outlines additional assessments / surveys required to progress the preferred option.

2) Design and approvals

This will include details of the design of the works, including approach to construction, feasibility of the works, potential impacts, estimated costs, and maintenance requirements. It may be undertaken in two stages, with stage one outlining the design and stage two providing more detail.

It will include a flood risk assessment, informed by hydraulic modelling, and engineering drawings to inform delivery of works on the ground. It will include all necessary surveys, such as topographic, hydromorphological and habitats / species surveys, and all relevant consents and approvals.

Note: Consents and approvals

You will need to adhere to all relevant regulations and obtain licenses as appropriate. These include:

- Controlled Activities Regulations
- Waste Management Licensing Regulations

You should also determine whether you need to seek planning permission from your local authority, and confirm that no protected species or habitats are at risk from the works (preworks assessment will include habitat and species surveys to inform this). Any works within a designated site will require approval from NatureScot.

What you should do

Your initial application should include a plan showing the locations of the embankment(s) you propose to remove or lower on a 1:2,500 map and summarising how spoil material will be disposed of and how vegetation will be reinstated. Pre-works assessments and designs should be provided prior to any works being carried out.

The work required to remove, breach or lower a river embankment is site specific and will be best carried out by a contractor with experience in river works. Work should preferably be carried out in late spring to early autumn to reduce the risk of damage to the river environment and to allow time for vegetation to establish before winter.

Movement of spoil material will need to comply with the waste management licensing regulations and may require soil testing, particularly if you are moving material off site. Care should be taken to avoid soils entering the watercourse during the works and vegetative cover should be allowed to re-establish on any bare ground remaining after the embankment is removed.

How can you add value

Consider adopting this measure with the management options:

- Wetland Management
- Species-rich Grassland Management
- Converting Arable at Risk of Erosion or Flooding to Low-input Grassland
- Management of Floodplains

Also consider working together with your neighbours, in such instances, you should consider seeking the help of a facilitator.

Maintenance

Maintenance is relatively straight forward compared to the implementation of works. You should ensure that livestock cannot access the area when vegetation is establishing and that the area remains vegetated by managing grazing appropriately. If erosion / scouring of the river bank occurs then this should be repaired and the land re-vegetated.

Further information

Guidance documents

- European Centre for River Restoration
- River Restoration Centre – Manual of River Restoration Techniques
- Scottish Environment Protection Agency – Engineering in the Water Environment – Good Practice Guides

- The Scottish Rivers Handbook: A Guide to the Physical Character of Scotland's Rivers, Perfect, C., Addy, S. and Gilvear, D. (2013)

Case studies

- Lorgy Burn, Scotland
- Long Preston Deeps restoration, England
- Burn of Mosset, Scotland
- River Gowen embankment removal (video)
- Long Eau floodplain reconnection, England

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