

Rivers naturally change their shape and position over time, but major changes usually only happen in large floods.

This leaflet shows how to manage some of the most common river changes, and describes the affect that some activities, such as dredging, can have on rivers.

Dredging and flooding

Q Why can't rivers be dredged?

A Dredging is not always effective in reducing flood water levels. It also damages plants and animals living in the river and can cause other problems such as increased erosion and higher flood risk downstream. However, a river can be dredged if it is clearly the best way to solve a problem such as flood risk. SEPA will always seek the best long-term sustainable solution.

Q But doesn't a larger river channel lower flood water levels?

A Not always, because:

- flood water can be held back by other structures, such as bridges or culverts;
- the volume of water transported during a flood is often more than even a dredged channel can contain;
- flood flows can transport a large amount of sediment which quickly refills the dredged area.

Q Does dredging ever reduce flood water levels?

A Dredging can help reduce flood risk in some situations.

For example:

- if sediment is trapped at a structure (such as a bridge) that cannot be modified or redesigned, then removing sediment from the structure can help;
- if a watercourse has been widened in the past and now traps sediment arriving naturally from upstream and it cannot be restored to a more natural state to prevent this, then removing the trapped sediment can help.

Dredging will still cause serious environmental damage in these circumstances, so care must be taken.

Q What are the effects of dredging?

A Dredging that reduces flood risk in one location allows water to move downstream faster, which can increase flood risk elsewhere.

It can disturb the natural balance of rivers, leading to dramatic and unforeseen changes such as increased erosion. This can cause problems for land management and infrastructure that can last for decades.

Dredging also destroys river habitats, such as salmon spawning areas. Populations of very sensitive protected species, such as lamprey and fresh water pearl mussels, can be seriously damaged too.

Q What management options do I have?

A The table on the back of this leaflet gives advice on suitable actions for different situations. Dredging should only be undertaken when there is evidence that it will be effective and when there is no sustainable alternative.

You should contact your local SEPA office if you are considering engineering works. We will discuss options with you to ensure you comply with current regulations.

Q What are the river engineering regulations?

A River engineering, including dredging and smaller scale sediment removal, must be authorised by us under the Water Environment (Controlled Activities) (Scotland) Regulations 2005 (otherwise known as CAR). In most cases this means the operator must apply to us for either a registration or licence.

Q I am a contractor. Does this affect me?

A If you are contracted to carry out works in a river on behalf of a landowner then you must ensure the works are authorised by us. Contact us if you are in any doubt.

More information

Our *Good practice guide to sediment management* and the *CAR practical guide* are both available at: www.sepa.org.uk/water/water_publications.aspx

Our restoration fund might help fund sustainable options: www.sepa.org.uk/water/restoration_fund.aspx

If activities are proposed in an area designated as a Site of Special Scientific Interest, Special Area of Conservation or a Special Protection Area contact Scottish Natural Heritage (SNH) for advice: www.snh.org.uk



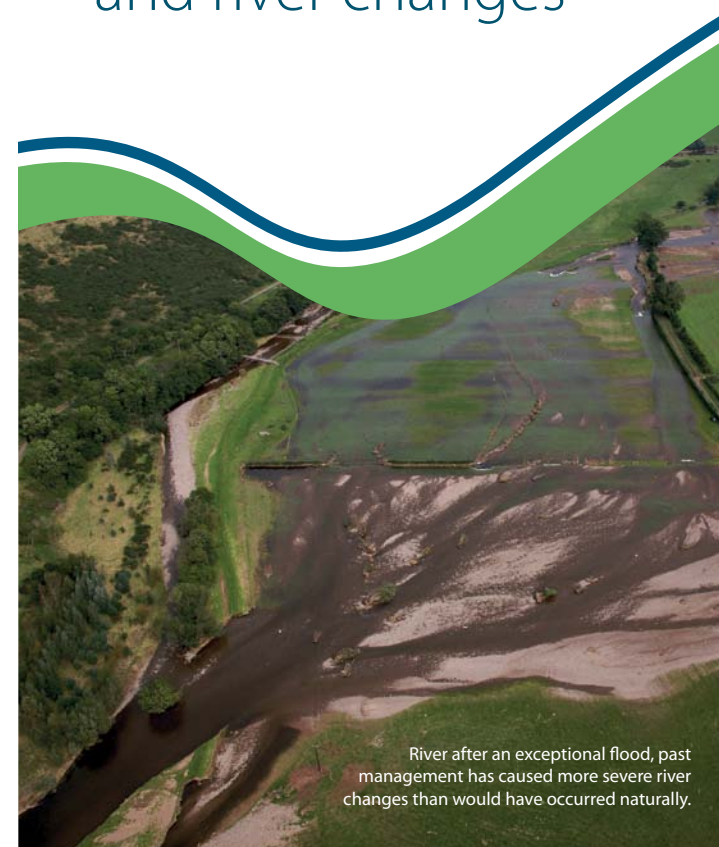
Managing river changes

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Before	After	Situation	Likely causes	What to do	
		Gradual change (several years)	Sediment is accumulating leading to gradual narrowing of the channel.	Past modification creating excessively wide channels which trap fine sediments such as silt. If the sediment is coarse (such as gravel) there may be over-supply from upstream.	Restoration to a more natural channel shape might prevent accumulation. Funding to restore rivers could be available from SEPA you can discuss this with your local SEPA office. Dredging is not recommended because it widens the channel and traps sediment. Manage over-supply of coarse sediment from upstream by dealing with the source; look upstream to identify sources of erosion.
		Gradual change (several years)	Gravels are accumulating on the inside of a bend, with gradual erosion of the outer bank. This can occur at several bends but much of the river is stable.	Natural meander evolution, which indicates that the river is operating normally. Natural channel change helps to dissipate the energy of flood flows, which keeps river changes gradual and more manageable.	Let these natural changes take place where possible. Monitor the situation and take photographs of the changes throughout the year to document the rate of change. Engineering might be needed in some situations, for instance if the changes threaten a road or house.
		Sudden change (one flood)	Sudden change has occurred in a small area, such as a bend in the river developing after a single flood.	A large flood transporting more sediment (eg gravel) than usual. Or a 'one-off' over-supply of sediment (eg from a land slide) from upstream.	Let the river stabilise naturally if possible, often the river will stabilise in its new shape. Monitor the situation and take photographs of the changes throughout the year to document the rate of change. Engineering might be required in some situations, for instance if rapid changes continue or the changes threaten a road or house. Contact SEPA for advice if that happens.
		Rapid change (one flood)	Sudden changes have occurred over a large area, such as extensive sediment accumulation, or channel movement to a new position.	Natural causes include large, rare floods or a 'one-off' over-supply of sediment (eg from a land slide) from upstream. Past modification often makes rivers more prone to change.	Investigate the cause and monitor the change. If the cause is natural, let the river stabilise naturally if possible. If the cause is due to past modifications then restoration to a more natural channel shape could help. Rivers which experience such dramatic changes are likely to be very sensitive to engineering, so work must be carried out carefully. Contact SEPA for advice.

Floods, dredging and river changes



River after an exceptional flood, past management has caused more severe river changes than would have occurred naturally.