

Watercourse and riverbank management

Good management of watercourses and riverbanks can help reduce bank erosion, increase wildlife habitat and keep water clean.

Riverbank erosion is a natural process but it can be accelerated by livestock grazing and invasive species leading to the loss of land and damage to wildlife habitats. Ditches and drains often form a direct route between the farm yard and the river and can be a path by which fertilisers or chemicals enter a river.

Good Practice

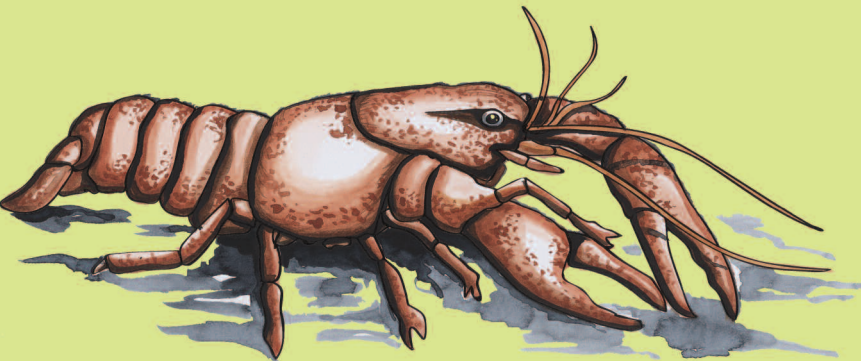
- Avoid spreading fertilisers, manures, slurries and other chemicals near to ditches and watercourses.
- Know which farmyard drains run into ditches and streams, and identify as clean water drains.
- Ditches can help filter out silt and pollutants before they reach the river. Frequent clearing can disturb this filter and should be avoided where possible.
- If dredging of ditches is unavoidable, phase operations over several years rather than clearing the entire length at once.
- Parasitic control in sheep is important for maintaining flock health but the chemicals used can be harmful to wildlife, people and the environment.
- To protect yourself, your sheep and avoid water pollution always refer to DEFRA's Groundwater Protection Code: Use and disposal of sheep dip.
- To prevent pollution disposal of waste sheep dip must be carried out in accordance with an environmental permit from the Environment Agency.
- Bank erosion is a natural process – where this is the case consider allowing the river to erode freely to protect wildlife habitats e.g. sand martin burrows.
- Where erosion control is unavoidable use soft revetment e.g. willow spilling, brush and woody debris. This can provide valuable wildlife habitats as well as slowing erosion.
- Hard revetment should only be used as a last resort.
- Always check if you need Environment Agency consent before starting works to or next to watercourses and riverbanks.

White-clawed crayfish

White-clawed crayfish are our largest freshwater invertebrates. They can grow up to 12 cm long and live for up to 10 years. They live in clean, limestone-rich rivers with a medium flow of water, where they hide under rocks, tree roots and overhanging banks. Where they occur they are an indicator of healthy river systems. They are mostly nocturnal, feeding on other invertebrates, algae, plants and organic material such as fallen leaves.

Cumbria is the best remaining stronghold of white-clawed crayfish in Great Britain. They are Britain's only native crayfish species and are protected by law. They are severely threatened by the spread of non-native crayfish, particularly the American signal crayfish, which replace the smaller, less aggressive native species wherever they occur. Non-native crayfish can also carry a fungal disease, crayfish plague, which wipes out native crayfish populations.

Pollution and habitat modification have also contributed to their decline. White-clawed crayfish are very sensitive to changes in water quality and pollution such as pesticides, sewage, silage and slurry. Living on the river bed, they are also susceptible to increased sediment in the river arising from erosion and soil run-off.



The White-clawed crayfish found in Cumbria

What's in it for the farm?

- Increased capital value of holding.
- Significant improvements in water quality - reduced risk of pollution and prosecution.
- Savings in reduced fertiliser applications and losses to the river.
- Reduced soil damage and loss - increased crop production.
- Reduced erosion and land loss.
- Reduced lameness, infection and vet bills.
- Improved stock handling.
- Improved sporting potential.
- Good relationships with neighbours.
- Sustainable timber/firewood crop arising from trees and woodland management.
- Improved wildlife and recreational value.

Keeping it legal

Before undertaking any works consult the relevant authorities!

- Will the work affect a designated site? eg Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protection Area (SPA), Scheduled Ancient Monument (SAM), etc? Seek advice from Natural England or English Heritage.
- Will the work affect protected species? eg otters, bats, etc. Seek advice from Natural England as a license may be required.
- Consult the Environment Agency before undertaking any works on a river or ditch.
- Do not undertake in-stream or bank profiling work without first gaining permission from the Environment Agency.
- An Environment Agency license is required if spraying herbicide near to or on any watercourse.
- A felling license is required if more than 5m³ of timber is coppiced in a calendar quarter.
- If in doubt, consult the Environment Agency.

Help and advice

There is lots of support to help manage our rivers and streams. Help to gain consents, capital grants, deal with the paperwork and provide advice. It's all out there and often free.

The Rivers Trust - Pinpoint best practice information sheets – www.riverstrust.org/pinpoint
Catchment Sensitive Farming Initiative – www.naturalengland.org.uk/ourwork/farming/csf

Eden Rivers Trust – www.edenriverstrust.org.uk

Environment Agency – www.environment-agency.gov.uk

Farming and Wildlife Advisory Group (FWAG) -www.fwag.org.uk

Forestry Commission – www.forestry.gov.uk

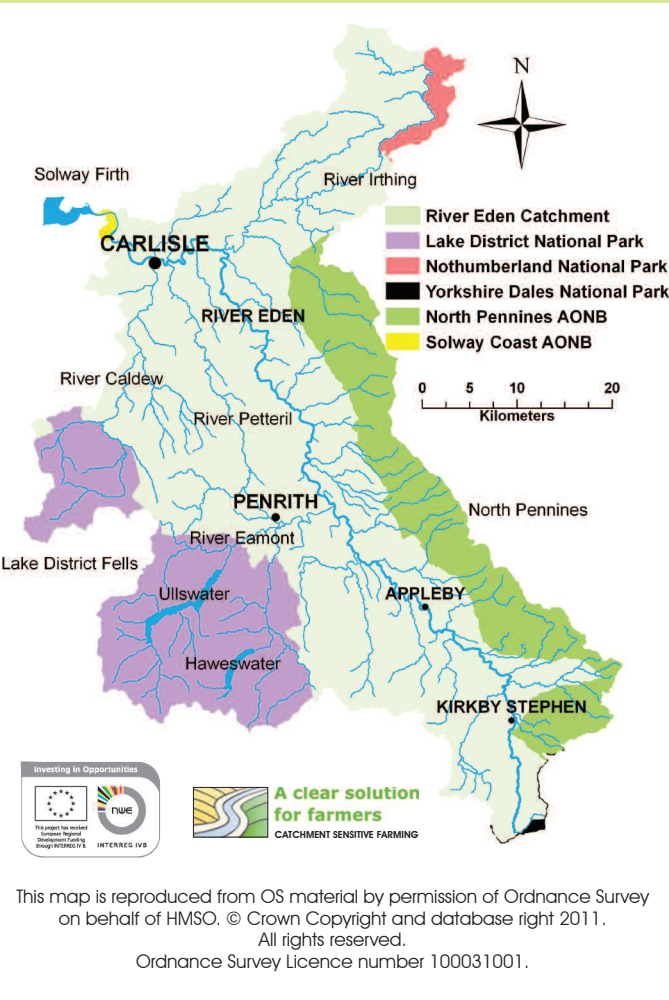
GB Non-Native Species Secretariat – www.nonnativespecies.org

Natural England – www.naturalengland.org.uk

The River Eden

A special place for wildlife

The River Eden is home to many threatened plants and animals, including the White-clawed Crayfish, Atlantic Salmon, Dipper, Otter, Brown Trout, Lamprey, Water Vole, Sand Martin, Eel and Bullhead. The River Eden is designated a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC).



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Eden Catchment Water friendly farming Good Practice Guide



Water friendly farming can help keep our rivers clean, reduce flooding, improve farm efficiency and save costs.



Water friendly farming

Controlling runoff at source

Good management of soil, water and nutrients at source can help keep the river clean, reduce flood and drought risks and prevent the loss of valuable resources from the farm.

Soil and nutrient losses from the farm can be costly and have a major impact on the river. Increased levels of phosphates and nitrates in the river can encourage algae to grow starving wildlife of oxygen. Soil particles can smother river gravels with the loss of vital fish, insect and crayfish habitat. Rapid surface runoff can cause soil and gully erosion, increase flood risk downstream, and prevent valuable water being stored in the soil.

Clean and Dirty Water Separation

- Ensure dirty water draining from yards, stock pens and tracks is diverted away from watercourses and into dirty water or slurry storage facilities.
- Consider roofing stock gathering areas, yards, and manure stores to minimise the production of dirty water. This will relieve pressure on storage facilities and reduce the frequency of spreading operations required.
- Ensure guttering, downspouts and pipe work are in good working order – consider storage of clean roof water as an alternative to more expensive sources e.g. for cleaning operations.

Managing Soils

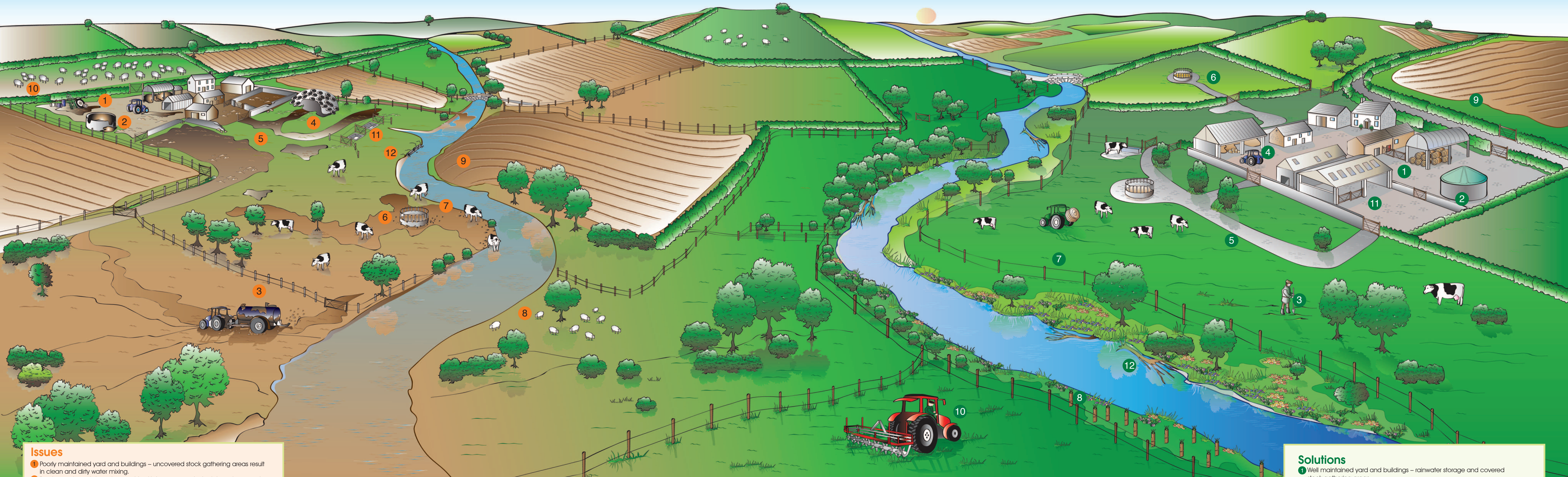
- Implement soil, crop and nutrient plans. Identifying areas of erosion and runoff risk will help safeguard the most valuable resources on the farm.
- Regular soil nutrient testing can help prevent over application, reduce fertiliser costs and make the most of on-farm manures and slurries.
- Avoid over-stocking particularly during winter and choose winter grazing sites carefully to avoid erosion prone locations.
- Avoid vehicle movements and wheel ruts on wet soil.
- Capping and compaction - check soils regularly and consider soil aeration. Breaking up compaction can help more rainfall to enter the soil, reducing rapid surface runoff and erosion. Improvements in soil structure can also help improve plant growth.
- Utilise a cropping sequence that ensures ground coverage throughout the year.
- At field corners consider creating small ponds or filter-beds to encourage settlement of silt.
- Consider permanent vegetation (hedgerows, woodland, grass buffers) on steep slopes, natural drainage pathways at risk of gully erosion, field boundaries and wet soils in difficult corners. This can help trap soil and nutrients and slow the flow of rainfall to the river.

Large woody debris

Large woody debris, which includes branches, trunks and root boles, is a valuable asset to the river. It provides shelter and food for lots of wildlife, including fish, crayfish and around 150 species of insect. In small streams the pools created by large woody debris can provide up to half of the fish spawning and rearing habitat.

The benefits of large woody debris

- Creates diverse flow conditions.
- Creates niche habitats and cover valuable to wildlife.
- Valuable as resting sites for otter and nesting sites for grey wagtail and dippers.
- Increases the range of stream temperatures.
- Can help stabilise eroding riverbanks.
- Helps improve water quality – increases stream oxygen levels by making it more turbulent.
- Collects leaf litter – a valuable food source for aquatic insects and crayfish.
- Can help slow river flows during a flood reducing flood risk downstream.



Issues

- 1 Poorly maintained yard and buildings – uncovered stock gathering areas result in clean and dirty water mixing.
- 2 Poorly maintained slurry store next to ditch – increased risk of slurry draining into the river.
- 3 Over and untimely application of fertilisers, manures and slurries – increased nutrient loss and water pollution.
- 4 Silage clamp next to ditch – increased potential for leachate to drain into the river.
- 5 Poorly maintained tracks can act as a pathway to the river for dirty water and animal wastes.
- 6 Poorly sited livestock feeder and gateways – poached soil prone to erosion, compaction and runoff.
- 7 Uncontrolled stock access to the river resulting in trampled and eroded river banks, direct inputs of faecal material and increased risk of water borne diseases, injury and lameness in stock.
- 8 No riverbank trees – lack of cover for wildlife and risk of high water temperatures during summer.
- 9 Arable field on steep slope next to the river – no in-field grass or shrub buffer between field and river to help intercept runoff.
- 10 High stock densities and use of heavy machinery – increased risk of soil compaction, surface runoff and erosion.
- 11 Stock handling areas such as dipping pens next to watercourse – increased risk of animal waste and insecticides entering the river.
- 12 Inappropriate, unconsented bank reinforcement can damage river habitat and increase erosion.

Livestock and rivers

Where livestock have free access to the river, water quality can be poor.

Trampled river banks lead to erosion, over-wide channels and shallow watercourses. This is made worse by compaction of the surrounding soil which leads to greater runoff and deposition of fine silt on the riverbed. Silt robs the riverbed of oxygen by blocking the spaces between the gravels, significantly reducing the number of invertebrates and suffocating large numbers of fish eggs. Uncontrolled stock access also adds animal wastes to rivers further raising nutrient levels. This encourages algal growth which smothers sensitive aquatic wildlife.

How to protect rivers from livestock

- Reduce stocking densities to avoid overgrazing, compaction and soil erosion, particularly during winter and spring months.
- Provide troughs on a hard base away from watercourses instead of using the river for stock drinking.
- Site feeders away from watercourses and move them regularly.

- Identify erosion and pollution hot spots such as tracks, yards and gateways.
- Move, drain or resurface these hot spots to reduce soil and animal wastes entering rivers. Stable, firm surfaces will also help reduce lameness in cows.
- Create buffer strips to intercept unavoidable run off and pollution caused by stock.
- Use temporary or permanent fencing to exclude livestock from river banks.
- Avoid or improve watercourse crossings to minimise the risk of water pollution and stock injury and lameness.

Benefits of fencing watercourses

- Allows riverbank vegetation to re-establish, helping to stabilise eroding riverbanks.
- Allows the river to narrow and deepen, to encourage 'scouring' of the riverbed.
- Establishes a buffer strip between the river and farming operations – intercepts soil and run off.

- Encourages overhanging bankside vegetation, providing valuable cover and food for fish, crayfish and other wildlife.

Good practice

- Set fencing at an appropriate distance from the river.
- Align fencing parallel to flow and build in break points to minimise potential flood damage.
- Temporary electric fencing or three lines of wire may be more appropriate than stock netting in areas of high flood risk.
- Make provision for gated access, to allow control of invasive vegetation by topping or occasional grazing by livestock.
- Troughs should always be used in preference to drinking bays.
- Drinking bays, if unavoidable, should be placed on the inside of meanders or protected by upstream trees and should not impede flow.
- Access ramps should be sited on a slope of no more than 1:6 and should be surfaced with local stone held in place at the toe of the bank with untreated timber or similar.

Invasive species

A variety of introduced plants and animals are a threat to river wildlife. Examples include Himalayan balsam and Japanese knotweed which have colonised river banks and suppress native grasses and flowers. Management of these involves repeated hand pulling, strimming at ground level or spraying with herbicides, which requires an Environment Agency license if carried out near water.

Other invasive non-native plants and animals, such as the American signal crayfish, can have a damaging impact by spreading disease, competing for habitat and food and direct predation.

People may unknowingly be spreading invasive species from one water body to another with vehicles, soil, equipment, shoes and clothing. Everyone can help to stop this happening by following three simple steps: Check, Clean, Dry.

Solutions

- 1 Well maintained yard and buildings – rainwater storage and covered stock gathering areas.
- 2 Covered, well maintained slurry store with adequate capacity located away from watercourse.
- 3 Regular soil monitoring and nutrient budgeting reduce the need for chemical fertilisers.
- 4 Covered silage clamp located away from the riverbank.
- 5 Well maintained tracks with drains connected to dirty water system and store.
- 6 Gateways and livestock feeders located away from the river and drainage pathways to reduce erosion.
- 7 Fenced river and ditches to prevent stock access - well vegetated banks help intercept runoff, reduce erosion and provide cover for wildlife. Alternative livestock watering e.g. trough on hard-standing.
- 8 Riverside tree planting helps provide cover and habitat for wildlife and moderate water temperatures.
- 9 Arable field located away from river on gentle slopes, with grass margins and hedgerows to intercept runoff.
- 10 Soil aeration can help break up compacted layers.
- 11 Covered stock handling pens located away from the river.
- 12 Beneficial in-stream woody debris – located to reduce bank erosion and increase river habitat diversity.