# Water margins

Water margins are the area immediately adjacent to waterbodies, whether still or flowing, including rivers, ditches and ponds. These habitats can be very important for the health of waterbodies and farmland. If managed appropriately these habitats can: prevent soil erosion; improve soil structure; enhance biodiversity; improve water quality; and help alleviate diffuse pollution risks from agricultural land. If situated appropriately and managed, water margins act as a buffer between the managed land and the water. They slow the flow of overland runoff, increase infiltration and prevent soil, sediment and nutrient loss from fields.

## Ecosystem services supplied by water margins

| Provisioning | Cultural | Supporting |
|---|---|---|
| • Wild foods<br>• Water supplies<br>• Timber<br>• Renewable energy<br>• Livestock<br>• Crops (and feed) | • Opportunities for recreation<br>• Landscape and Aesthetic value<br>• Cultural heritage | • Nutrient cycling<br>• Soil formation<br>• Water cycling |

| Regulating | |
|---|---|
| • Local climate regulation | • Air purification |
| • Carbon storage and sequestration | • Pollination |
| • Flood control | • Pest and disease regulation |
| • Water purification | • Soil quality and erosion regulation |

## Ecosystem service example: water purification

Water margins within water environments provide the valuable service of water purification. Dependant on their structure, plant and tree roots bind soil together and reduce the erosion risk preventing excess nutrients and sediments entering the waterbody. Surface vegetation provides a barrier for surface run-off, allowing sediments to be deposited before entering the watercourse and sub-surface root systems can break down pollutants before they reach water environments.

Fenced off water margins, or those with dense vegetation can also act as physical barriers to livestock poaching **(GBR19)** and prevent direct contamination of watercourse from urine and dung.

Visit **Farming & Water Scotland** to identify and assess diffuse pollution risks on your land and find out practical ways to protect and enhance water quality using **The 4 Point Plan**.

# Biodiversity

## Risks to be aware of

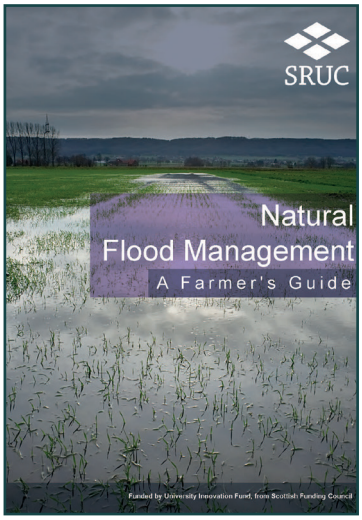
Invasive Non-native species (INNS) can pose a risk to biodiversity if they are allowed to establish. Tackling them is a **requirement of the Water Framework Directive** and their presence on riparian habitats has a **direct negative impact on invertebrates and salmonid fish in Scottish rivers**.

Invasive plant species associated with water margins include:

**Japanese Knotweed:** Grows extremely densely and shades out native plants. It makes a very poor habitat for insects, birds and mammals.

**Himalayan Balsam:** Grows in dense clumps smothering native plants and seeds carried downstream and deposited throughout water environments. It also dies back in winter and creates large patches of bare soil. Read more about the control of these species on the **FAS Technical Note**.

## Management actions to enhance




- As water temperatures increase, as a result of climate change, land managers can implement strategies on their land to help alleviate some of the impacts on biodiversity. By creating shade for waterbodies with trees, cooler areas within the water environment are created. These habitats benefit species such as fish, otter, bats and tree nesting ducks – such as Golden eye.

- Trees and woody material in waterbodies create micro habitats. These areas are important habitats for river species, from providing areas for spawning and offering shelter from high flows and predators while reducing the flow. **Read more about the benefits of trees and water**.

- Water margins are excellent wildlife corridors linking and extending riparian zones to other terrestrial habitats.

- Allowing areas of land to retain and slow down water in high river flow periods can create **benefits to your land**. Introducing **green engineering** can also utilise the water margin to protect land. More information can be found in SRUC's **The Natural Flood Management Guide**.

- Introducing 3D buffer strips can enhance the ecosystem services provided by standard buffers. The combination of grassy and woody buffers while addressing subsurface flows and pollution pathways can offer huge benefits to your land.

- Avoid accidentally introducing invasive species to your land by ensuring machinery entering the farm is clean and avoid planting invasive species ornamentally in amenity spaces such as gardens. Find out more about the plans for the water environments near your land as part of **Biosecurity Action plans**.

- Learn more about establishment and sustainable management of Riparian Zones in **SEPA's Riparian Vegetation Management Good Practice Guide.**

## Assessing the condition of water environment

If a river has a Water Framework Directive classification; you can assess its condition through a web mapping portal or download its data sheet. If it is not included, survey your river for emergent, submerged and floating leaved plants, algae / duckweed, marginal vegetation, ditch damage, shade, non-native species and water clarity.

Assess the condition of your water margins using information on the Farm Advisory Service's **Water Margin webpage**.