



Briefing

River restoration for nature and climate resilience

Summary

- Restoring rivers to a more natural state is increasingly being recognised as a nature-based climate adaptation solution. Measures such as riparian tree planting and natural floodplain management can prevent drought and extreme flooding and also have many benefits for biodiversity and human health and wellbeing.
- Key to achieving thriving and ecologically functional river systems in a landscape which is mostly farmland is to support farmers to integrate river restoration and riparian habitat creation into their land management practices.
- We want to see a boost to the budget for nature-friendly farming in Scotland, both from public and private sources, so that farmers can be properly incentivised to take up riparian-focused grant options collaboratively and at scale.
- Species which both rely upon and contribute to the health of our river systems, such as the Atlantic salmon and Eurasian beaver, are directly and indirectly affected by the heavily modified nature of our rivers and the land management practices around them.
- Making space for the natural flow of rivers within highly managed landscapes and restoring riparian habitat connectivity will contribute to the delivery of many of the Government's environmental and biodiversity commitments, such as those contained in the Scottish Biodiversity Strategy; Nature Networks; the River Basin Management Plan for Scotland; the Scottish Wild Salmon Strategy; and Scotland's Beaver Strategy.

River restoration in the farming landscape

Scotland's river system has the potential to provide a suite of ecosystem services for the benefit of people, climate and nature. Making space for the natural flow of rivers and restoring riparian habitat can benefit biodiversity by increasing habitat availability and connectivity for countless species. There is also great potential with river restoration as a nature-based solution to improve the resilience of our land to the adverse effects of climate change and reduce the risk of drought, extreme flooding, severe erosion and soil loss, all of which are becoming more common in heavily managed landscapes as climate change progresses.

Three quarters of Scotland's land is agricultural, so the majority of our rivers and streams run through agricultural land. This makes farmers key stakeholders in the river restoration process. Without the widespread cooperation of the farming community, river restoration at the scale required to restore nature and install landscape-scale resilience to the effects of climate change will not be possible.

Creating riparian habitat and restoring floodplain connectivity on farmland doesn't always mean taking land out of production. Often these features can be integrated as part of a holistic management approach. If we want to see a thriving, connected riparian habitat network across Scotland, however, ideally some prime agricultural land would be converted to make space for riparian buffers and reconnecting rivers to their floodplains in some places.

Many farmers, understandably, struggle to manage the short-term loss in profits associated with converting land to deliver nature-based solutions. The agricultural payments system needs to do more to incentivise nature-friendly and climate resilient land management options such as wide river buffers, floodplain management and riparian planting.

Riparian grant options

There are currently several grant options available through the Forestry Grant Scheme (FGS) and the Agri-Environment Climate Scheme (AECS) aimed at riparian buffer creation and natural flood management. However, uptake on these options tends to be quite low. Some of the potential reasons for this include:

- The money offered per hectare does not compensate for the loss in revenue from converting productive land. Wide river buffers are not incentivised.
- Grants are only paid for (max) 5 years. Some farmers convert back to original land use after the grant period has ended.
- Applicants can spend significant amounts of time and money on applications. Competitive nature of grants means there's no guarantee that the application will be successful. Farmers don't want to risk wasting resources, so don't apply.
- Deer can be a deterrent to riparian woodland creation. Land owners don't want to risk planting trees in areas with high deer densities.

Addressing these barriers to uptake will require a combination of 'carrot' and 'stick'. We would like to see a move towards some riparian grant options being included in tier 2 of the rural payments scheme, as well as increased payments for riparian schemes which involve significant loss of productive land, and a mechanism for farmers to receive maintenance payments for these schemes beyond the standard five-year period. Initiatives to educate farmers on the benefits to their farm business from natural flood management and integrating trees, such as those currently being delivered by the Farm Advisory Service and Scottish Forestry are also very important and should be continued. There is also a lot of potential to unlock responsible private investment to help pay for these schemes.

Deer

Bringing deer densities down across the landscape will be essential for widespread riparian restoration. Incentives for deer management which allows natural regeneration would negate the need for tree planting or fencing (where livestock are not present). We would like to see deer management incentives included in tier 2 of the new rural payments scheme. Ecologically sustainable deer management should be seen as a basic part of responsible rural land management. There may also be a part for the proposed Deer Management Nature Restoration Orders (DMNROs) to play if lack of deer management in places is threatening the success of a landscape-scale riparian restoration project.

Atlantic salmon

The Atlantic salmon is an iconic and economically important species in Scotland, bringing in an estimated £80 million to the economy every year and creating 4300 jobs. But salmon face a barrage of environmental pressures in both the marine and freshwater phases of their lifecycle. As a result of these pressures, the species has been in decline in Scotland since the 1970s, and in 2018 rod-catch numbers were at their lowest ever recordedⁱ.

In 2018, 69% of Scotland's rivers experienced temperatures at or above the lethal limit for salmon for one or more daysⁱⁱ due to the interacting pressures of climate change, and a lack of natural resilience to rising temperatures in our river systems due to the absence of shade-giving riparian vegetation and lack of floodplain connectivity in many placesⁱⁱⁱ. Additionally, extreme high and low flows, fine sediment load from bank erosion, lack of streambed complexity, diffuse pollution and invertebrate prey availability are all issues for salmon in highly modified river systems^{iv, v}.

It is widely recognised that the most effective way of boosting our salmon stocks is to return our rivers to a more natural, healthy state^{vi, vii, viii, ix}. Indeed, the top priority of the Scottish Wild Salmon Strategy is to improve the condition of rivers and give salmon access to cold, clean water^v. Projects like the Spey Catchment Initiative's pioneering Allt Lorgy river restoration project^x, which encourage natural processes to return, and restore habitat complexity and climate resilience to our rivers, are vital for the Atlantic salmon's survival in Scotland.

Eurasian beaver

Another species which can not only benefit from riparian habitat creation, but also contribute to the river restoration process, is the beaver. Beavers are ecosystem engineers and can significantly modify habitats to suit their needs^{xi}. When given the space to carry out their natural behaviour, beavers create wetland habitat mosaics which benefit many other species, including invertebrates, fish and amphibians. These wetlands, and beaver dams themselves, also trap fine sediment, filter diffuse pollution, and can help to moderate high and low stream flows^{xii, xiii, xiv, xv, xvi}. However, in heavily managed landscapes the damming and burrowing behaviour of beavers can be at odds with human land management objectives.

Currently the largest population of beavers in Scotland exists in a part of the country where farming land to the edge of the watercourse and lack of riparian habitat is common. Often landowners feel unable to accommodate beavers and apply for licences for dam removal, translocation and lethal control^{xvii}. We understand that some of the effects of beaver activity are not wholly convenient in a farming landscape, but a lot of what beavers do can be harnessed to benefit land managers and wildlife alike and we would like to see more farmers accommodating beavers and the habitat modifications that they make. We believe that the key to land managers realising the benefits that beavers, and other riparian nature-based solutions can bring to the landscape, is in supporting them to make space for the natural flow of rivers and wetlands.

Conclusion

Greater government investment in landscape-scale riparian restoration has the potential to deliver multifaceted benefits for climate, nature, economy and society. Furthermore, achieving connectivity of healthy, functioning riparian corridors across Scotland would help fulfil all six of the major objectives of the draft Scottish Biodiversity Strategy to 2045, and will be fundamental to the success of the Nature Networks Framework. Ultimately what is needed is a boost to the budget for nature-friendly farming, both from public and private sources. We need the 75% of Scotland's land that is farmland to do much

more for nature if we are to have any chance of reversing the decline of biodiversity in this nature depleted country. Better incentives are needed to help more farmers transition to farming systems which integrate habitat networks, celebrate living alongside keystone species and harness nature-based solutions for the sustainability of their own farm and for wider public and environmental benefit.

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- ⁱⁱ Marine Scotland (2019). Topic Sheet No. 143. Summer 2018 River Temperatures. Available at: [summer-2018-river-temperatures.pdf \(www.gov.scot\)](http://www.gov.scot/summer-2018-river-temperatures.pdf)
- ⁱⁱⁱ Fisheries Management Scotland (2023). Water Temperature. Available at: [Water temperature - Fisheries Management Scotland \(fms.scot\)](http://fms.scot/Water-temperature-Fisheries-Management-Scotland)
- ^{iv} North Atlantic Salmon Conservation Organisation (2020). *Pressure Points*. Available at: [Pressures Facing Salmon - NASCO](http://nasco.org/pressures-facing-salmon)
- ^v The Scottish Government (2020). Scottish Wild Salmon Strategy. Available at: [Supporting documents - Scottish wild salmon strategy - gov.scot \(www.gov.scot\)](http://www.gov.scot/supporting-documents-scottish-wild-salmon-strategy)
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- ^x Spey Catchment Initiative (2024) Allt Lorgy River Restoration Project. Available at: [Allt Lorgy River Restoration Project - Spey Catchment Initiative](http://alltlorgyriver.org.uk/allt-lorgy-river-restoration-project)
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