

NON-TECHNICAL SUMMARY DUNRUCHAN FARM PEATLAND RESTORATION PROJECT LESSONS LEARNED



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Background and Aims: Why was peatland restoration required and what did the project aim to achieve?

There are three Potentially Vulnerable Areas (PVAs) to flooding in the Allan Water Catchment as assessed by SEPA's National Flood Risk Assessment, required by the Flood Risk Management (Scotland) Act 2009. The Halcrow-CRESS Allan Water Natural Flood Management Techniques and Scoping Study, 2011, estimated via hydrological modelling that the River Knaik sub-catchment of the Allan Water contributed on average 23% of the flood peak in the downstream PVA of Bridge of Allan. As a result, opportunities for Natural Flood Management (NFM) were investigated in this catchment, with the aims of attenuating runoff and flood peaks, as well as providing multiple benefits to the catchment and wider society.

The NFM Programme

The River Forth Fisheries Trust (RFFT) is facilitating NFM on the Allan Water Catchment via the Allan Water Improvement Project Officer (PO) who is supported by the Allan Water Steering Group consisting of representatives from the Scottish Government, SEPA, Forestry Commission Scotland, RSPB and local authorities.

Dunruchan Farm Peatland Restoration Site

Dunruchan Farm Peatland is 48.2ha of upland blanket bog, which sits just below 300m altitude on a hill named Meall a'Choire Odhair. The peatland is located in the River Knaik sub-catchment, Perthshire, between the villages of Comrie and Braco at grid reference: NN79947 14088. The upland blanket bog at this site is actively used for sheep and cattle grazing by a tenant farmer and is under the ownership of Drummond Estate. The Hill Farming Act 1946 subsidised hill grips (or ditches) to be put into the peatland between the late 1940-80's to improve the land for grazing, however this work resulted in:

- The lowering of the water table, which hindered the functionality of carbon sequestration at the site and resulted in a carbon release due to oxidation of the carbon in the upper peat layer and therefore contribution to climate change;
- Hill grips that eroded over time leading to deeper and steeper ditches and gullies that caused a risk to livestock welfare and impacted the tenant farmer's access to the site;
- Lowering water quality downstream due to an increase of dissolved organic and particulate carbon in the water leaving the site, impacting on important salmon and trout habitat;
- And an increase in water conveyance from the site contributing to downstream flood risk.

Upland Blanket Bog Habitat

Blanket Bog covers 1.8 million hectares and 23% of Scotland, whilst also being an important global habitat capable of storing large amounts of carbon in its natural state, and attenuating the effects of climate change (SNH, 2015). It is estimated that 7-12.6% of the world's blanket bog habitat resides in Scotland, and therefore it is important for Scotland to restore damaged blanket bog habitats (Artz *et al.*, 2014). Blanket bog habitat is protected under EC Habitats Directive Annex I and is in the UK Biodiversity Action Plan (UK BAP) as a Priority Habitat, and as a result, UK BAP Scotland has a target of 600,000 hectares of blanket bog habitat to restore by 2020 (Artz *et al.*, 2014) (UK BAP, 1999).

Project Aims

The overall project aims were to restore carbon sequestration and functionality of the upland blanket bog peatland; provide a positive experience and benefit to the hill sheep farmer; improve water quality leaving the site for downstream fish habitat; and contribute to attenuating downstream flood risk.



Figure 1 Dunruchan Farm Peatland Restoration site before physical works.

Delivering the work: What was required to achieve the work?

Funding and finances

The Dunruchan Farm Peatland Restoration Project was funded by SNH's Peatland Action Fund to a cost of £38,000. The fund allowed the PO to act as an agent and the funding recipient on behalf of the land occupier (LO), who was a tenant farmer on the land. As a result, the RFFT was able to finance the work using their capital finances, which did not restrict this project to the finances available to the land occupier. SNH's fund allowed for the PO to submit more than one project claim during the project delivery phase. This was additionally favourable to RFFT as it allowed the Trust to pay the cost of the work in instalments during the project, and reserved finances from



the contractor in case they did not carry out the work as specified in their tender or did work of an unacceptable standard.

Approval

Approval for the work was obtained from the LO, and the overall landowner, Drummond Estate. The benefits to the LO of the peatland restoration work was seen as being fairly minimal, however it was identified that the LO had an interest in improving site access. Therefore, to obtain approval and support from the LO for the restoration project, the PO offered to fund some additional low cost access improvements out of a small budget <£1000, which would ease accessing and gathering livestock from the site. The small amount of money offered for access improvements played a significant role in the LO approving the £38,000 peatland restoration project to proceed.

Tendering and outcome of works

The Dunruchan Farm Peatland Restoration Project required that the work was put out to tender, scored, and then awarded to the contractor that best met the invitation to tender document. The first tendering process was for a peat depth survey of the site before physical works began, and the second tendering process was for the physical works. The contractor for the physical work delivered 48.2ha of restored peatland, including: 762+ (estimated 790) peat dams; 10.4km (10365m) ditch and gully reprofiling; 6 wooden sediment traps; 2x20m worth of ditch bunds/peat dams; 1x10m trench bund; and 7 plastic dams.

Lessons Learned

Tendering

During the tendering process it is important to keep communication with contractors curt but informative, and treat each contractor equally so there is no bias and no communications that appears to favour one contractor over another. Ensuring your invitation to tender has a clearly stated scoring and selection process will also benefit the project greatly in the event a tenderer requests feedback or challenges the selection of the chosen contractor.

“A high standard invitation to tender document should be reflected in the quality of tenders received and result in the successful contractor delivering the work to the desired standard.”

A well written invitation to tender is extremely important, and can be used to ensure the most appropriate contractors can be competitive for the work during the tendering process. A high standard of invitation to tender document should be reflected in the quality of tenders received and result in the successful contractor delivering the work to the desired standard. A clause should be used to allow the project to terminate the contract with the successful contractor if false or misleading information is used to win the tender. It is recommended that a successful contractor should have experience of working on a range of sites, including similar geographical areas, and have a comprehensive method statements for the design of structures that meets good practice and covers the complexities of the site. It is invaluable for the project completion deadline to include a large time contingency for unforeseen delays, particularly when working during the winter months.



Figure 2 Ewan Campbell of SNH visits the peatland restoration site in 2015 before our funding application.

Delivering the physical work

The project delivery phase begins when the successful contractor accepts the offer to carry out the physical works. The project manager must be prepared for alterations to the project plan and unforeseen delays caused by weather during the winter months or unfortunate incidents, such as mechanical faults. Therefore, as stated previously in the Tendering section, it is important to leave a large contingency period between the completion of works deadline and the funders deadline to allow time contingency for major alterations or delays to the project plan.



Figure 3 The contractor on site and delivering peatland restoration.



The contractor's project team as stated in the tender document, particularly the site foreman, should be the same individuals that will be working on-site. The tenders were scored on the experience of the project team members stated in the tender document and therefore that project team contributed to the contractor being awarded the work. There is a risk that a different project team may result in a less experienced and effective team than what was expected.

“It is important to acknowledge that SNH's Peatland Action Fund only covered capital costs and not project management time, which may impact on the delivery of the project.

The presence of a project manager that can be present on-site to guide work and make decisions when required is invaluable. Project managers can:

- inspect work;
- liaise with site foreman;
- make on-site judgement calls when barriers to the project plan were met;
- examine incidents relating to the contractor's health and safety, and environmental policy that may go unreported;
- and to inform the contractor of the standard of work expected from RFFT and the funder, SNH.

It is important to acknowledge that SNH's Peatland Action Fund only covers the capital costs of the peatland restoration work and not project management time, which may impact on the delivery of a project. Therefore, it is worth considering whether a fully funded staff member, like the PO, can take on this role.

The project must be flexible to account for unforeseen developments and change during the work phase. Changes to the work plan can occur during the delivery phase, which requires good communication with the funder to ensure they are informed and happy with the change of plan. In addition, close communication with the contractor is required to ensure they understand fully any changes to the project plan and update their strategy for completing the works to meet the project delivery deadline.



Figure 4 Contractor correcting a culverted crossing that was installed at the wrong location due to miscommunication.

Communication misunderstandings can be problematic to the efficiency of the project delivery. The project manager's time can be taken up ensuring the contractor's off-site project manager and on-site site foreman communicate with each other and are both able to provide an accurate answer relating to the delivery of the project. In addition, when the original tender project plan changes, it is paramount that the project manager and contractor communicate closely on works that are outside of the original project plan. If the contractor carries out work that was not desired and/or incorrectly placed due to lack of communication the efficiency of the project delivery is reduced as time is consumed correcting the work.

“The project found this unacceptable and was able to get the contractor to return to site to fix and improve each wooden sediment trap to an appropriate standard”

Post work

There were issues within a couple of weeks of the contractor having left the site due to inappropriate wooden sediment trap specifications for the peatland restoration site, which resulted in two of the wooden sediment traps failing. One of the wooden sediment traps had failed previously while on site and had had an attempted repair carried out on it but the repair had not lasted. Key reasons for the wooden sediment traps failing were:

- The boards were not built deep enough into the banks either side of the gully;
- V-notches that were put into the structures were not large enough to cope with the amount of water behind the structure;
- splash plates were inadequate and didn't cover the full base of the structure resulting in scour;
- and wooden sediment traps were sitting higher than the bank on one or either side of the trap, resulting in the water eroding a bypass channel around the structure.



Figure 5 A wooden Sediment trap that failed not long after the contractor left site due to the design of the trap for the location. As viewed in the picture, water has eroded around the wooden sediment trap through the left bank creating a bypass channel and making the trap redundant.

The project found this unacceptable and was able to get the contractor to return to site to fix and improve each wooden sediment trap to an appropriate standard that the project was confident in. The contractor returned to the site and installed larger U-shaped water release notches; ensured the trap was not higher than the bank height and amend it if it was; extend the top horizontal plank into the bank at least 0.6m either side; and where required add additional vertical posts for support to structures that were previously compromised. Following the completion of this work the PO was pleased that the wooden sediment traps were robust enough and should not require maintenance or cause the LO a negative experience.

An extended project completion deadline meant that the project manager had limited time to obtain the contractor's final invoice; submit the project and claim form; and submit the final project report to the funder. Repeatedly extended project deadlines that use up the project manager's time contingency leave little time for the project manager to complete the final administration for the funder's deadline. In addition, it is recommended that project managers are vigilant and inspect final invoices to ensure they are accurate before submitting to the funder. Contractors may have a number of projects that they are delivering, and as a result may forget to update their information on the work carried out before submitting their final project invoice, leading to additional delays. A shorter time period between the project completion deadline and the funders deadline can result in a highly stressful scenario for the project manager, and is recommended avoiding if possible.

Summary

The Dunruchan Farm Peatland Restoration Project provided the PO project manager with experience of project management and RFFT an opportunity to deliver a peatland restoration project. The project would not have been possible if SNH's Peatland Action Fund, which funded the work, did not allow RFFT to act as the agent and funding recipient on behalf of the LO. Having a

robust and well written invitation to tender and tender selection process helps to protect the project during tendering and delivery, and will help to choose the best contractor for delivering the project to a high standard.

However, despite Dunruchan Farm Peatland Project's best efforts there were still a number of issues that arose. Leaving a large time contingency in your project timeline between completion of works and the funders deadline will provide a safety buffer for unforeseen delays which are common, particularly when working in the uplands during winter months, and should allow you to meet the funder's deadline for submission of final claims and reports with greater ease. Ensuring the project team in the tender, especially the site foreman, is the same as the project team working on site is very important to ensure the team have the skills and experience that is expected to carry out the work as specified in the contractor's tender. The funding recipient should note that project management time, which was not funded in this project, took up a lot of the PO's time.

A project manager should be prepared to be on-site when required and to investigate any on-site incidents to ensure the contractor adheres to their health and safety, and environment policy as stated in their tender. Crucially maintaining regular and clear communication with the contractors site foreman and project manager is also very important to increase project efficiency. When on-site it is important to spend time walking over the site to ensure work is done to a satisfactory level, and anything that is not, is re-done or corrected. It is also worth being aware that some built features can be temporarily functional, but may not last the test of time if constructed to an unsatisfactory specification for the specific site. The Dunruchan Farm Restoration Project suffered from this issue with the wooden sediment traps, but the project was able to correct it by contacting the contractor to return to site. Lastly, it is important to examine invoices received from the contractor and to ensure they are accurate for work that they did carry out.



Figure 6 The completed Dunruchan Farm Peatland Restoration Project site.



Partners

The work on this project would not be possible without the input of time and expertise from a wide range of partners and stakeholders:

Steering Group	Other partners
Scottish Government Scottish Environment Protection Agency River Forth Fisheries Trust Forestry Commission Scotland RSPB Stirling Council Perth & Kinross Council Stirling University	Funder Scottish Natural Heritage Landowners and occupiers Dunruchan Farm Drummond Estate Other Forth District Salmon Fishery Board Allan Water Angling & Improvement Association

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