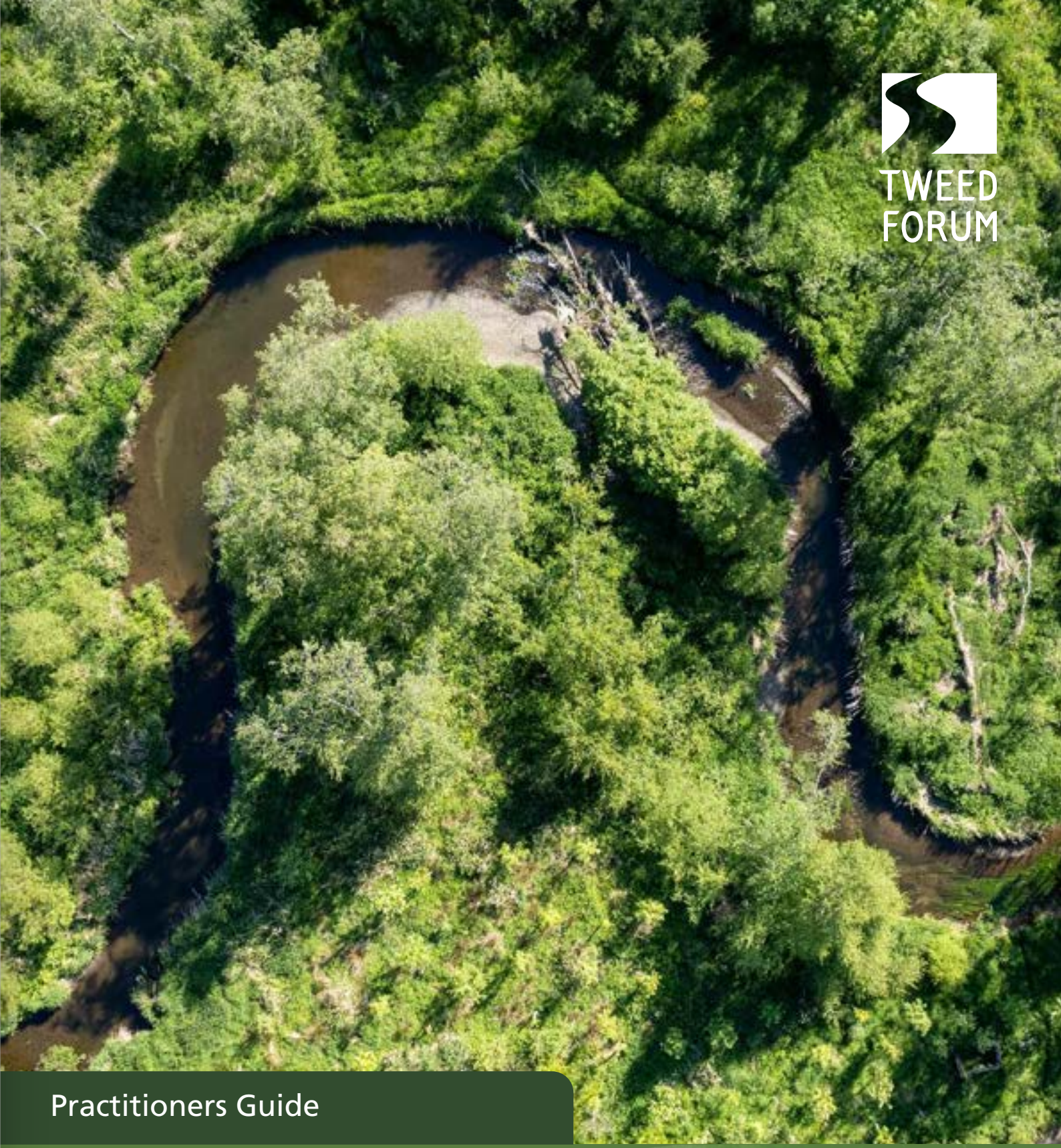


TWEED FORUM

Practitioners Guide

Riparian Woodland Creation

This publication was made possible with support from the Fishmongers' Company's Fisheries Charitable Trust

The FISHMONGERS' Company's FISHERIES CHARITABLE TRUST

RIVERWOODS

WOODLAND TRUST SCOTLAND

Contents

This is an interactive document so please refer to the online version for the live links:

www.tweedforum.org/woodlandcreation

Context

We are currently facing the twin existential challenges of the climate emergency and a biodiversity crisis. Scotland has lost much of its native woodland over millennia through habitat clearance, agricultural intensification and urban development.

Recent research by Marine Science Scotland has now confirmed that, without shade from trees, the summer temperatures in many headwater streams in Scotland are approaching lethal levels for our already-endangered wild salmon. This is a keystone species and indicative of all the problems facing our rivers and therefore the wider environment to which our rivers are inextricably linked.

There is now an overwhelming case for restoring and expanding native riparian tree cover. A number of bodies have been delivering native woodland creation in recent years with a focus on riverside areas, and the reasons for doing so have never been more urgent. These include:

- mitigating against climate changes (cooling water via shading)
- protection of biodiversity, including key species such as salmon and freshwater pearl mussels
- attenuating flooding (slowing the flow and increasing storage)
- improving water quality (through filtration)
- conserving soil (reduced erosion)
- sequestering carbon
- enhancing the landscape for amenity, recreation and tourism purposes

Creating more riverside woodland is key to building resilience for the future, but it needs to be targeted and at a scale to have significant impact and increase connectivity across the landscape.

Introduction

Much of Scotland used to be covered in native woodland. This woodland was made up of a wide range of species, including scots pine, birch, alder, oak, ash, hazel, willow, rowan, aspen, wych elm, hawthorn, holly, juniper, elder and wild cherry. Now, however, only 4% of Scotland's land area is under native woodland and some 70% of Scotland's watercourses are devoid of any tree cover.

This loss of woodland on our uplands and along our rivers has a number of damaging effects on our environment. Lack of upland cover increases run-off during heavy rain, increasing erosion and silting up the headwaters of our rivers. The lack of trees along the upper reaches of our rivers exposes the riverbed to direct sunlight, especially during the summer, increasing water temperatures to levels that are harmful to plants, fish and other aquatic wildlife. The iconic wild Atlantic salmon is particularly vulnerable to the effects of higher water temperatures, which reduce its ability to breed successfully or for its eggs to develop. It is estimated that 70% of Scotland's rivers were too warm for salmon during the summer of 2018.

Commercial, single-species forestry does not play the same role as diverse natural woodland in enhancing and maintaining our environment. This is why we need to take steps to establish native woodlands both in the uplands and along our rivers.

Our burns, streams and rivers are the arteries of life that run through our landscape and if we improve our water quality, by default, we improve the wider landscape by linking natural areas, enhancing and improving ecological corridors and creating a more integrated landscape.

Planting riparian woodland and expanding and protecting our remnants delivers multiple benefits and delivers significant cost/benefit returns and should be a priority focus for delivery agents and land managers alike.

This document is designed for those who have little or no practical experience of developing and delivering riparian woodland. It covers the full journey from engaging landowners and design through to acquiring funding and delivering native riparian woodland. It blends practical advice based on the experience of the contributors with information drawn from a wide variety of sources.

Although the guide focuses on establishing riparian woodland within upper catchment areas, it can also help guide efforts to establish native woodland schemes in other areas. That may also include the expansion and or restoration and protection of similar existing habitats.

Aim

The aim of this guide is to encourage people to plant the right trees in the right place for the right reasons (and at the right scale) to create a network of riparian woodland and healthy river systems throughout Scotland. This will deliver a range of benefits including flood attenuation, improved water quality and improvements for salmon and a multitude of other aquatic species, as well as helping to tackle the twin challenges of climate change and biodiversity loss.

Getting the right tree in the right place for the right reasons requires a pragmatic approach that combines a number of attributes:

- A clear end goal of protected watercourses.
- Understanding the process from start to finish.
- The soft skills to be able to approach and engage farmers and landowners.
- Technical knowledge and skills to enable delivery.
- Financial acumen and expertise to facilitate woodland creation projects.
- An adaptable core delivery model that works.
- Collaborative team working to aid in delivery.

This guide is skewed towards delivery in Scotland, specifically in terms of the delivery mechanisms and legislation. However, much of the content is applicable to establishing native riparian woodland across the UK.

It is hoped that this document can aid practitioners, both experienced and inexperienced, to deliver more and better riparian woodland to enable a better-connected landscape and improve water quality for humans, terrestrial wildlife and aquatic life alike.

Although tree planting can and is used successfully for Natural Flood Management (NFM) this document does not go into detail on how to plan these measures. Wetlands, ponds and scrapes, and flood plain reconnection are also vitally important, and opportunity for these should always be identified and where possible instigated.

For further reading on NFM see the following documents:

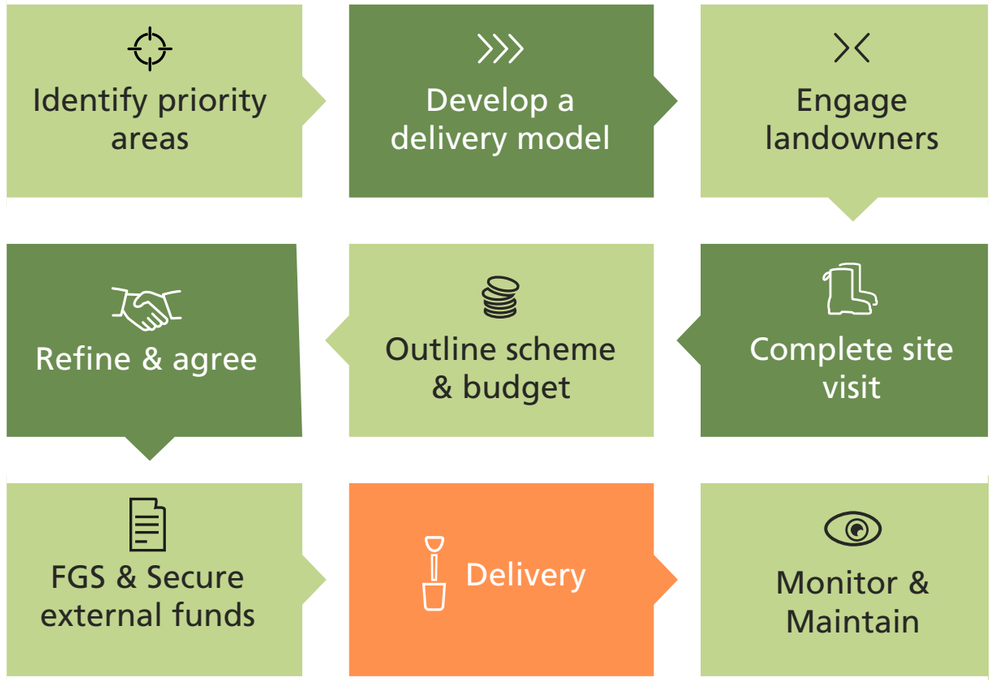
SEPA NFM Handbook

CIRIA NFM Manual

Riparian woodland establishing 10yrs after planting

Process Flow Chart

In its simplest form the following flow chart shows the process you need to consider:



The Vision

To restore the river and to make it more resilient to the threats of climate change, we need a vision of how the main river and its upland tributaries should look. Fortunately, there are a few areas in Scotland that we can take inspiration from, where rivers retain a natural shape and the vegetation cover (native woodlands with a ground and mid layer of semi-natural vegetation) is how it would have been before major impacts by humans and their livestock.

These include:

- Carrifran wildwood
- Creag Meagaidh
- Wildland

The detail of the vision depends largely on the surrounding landscape use, but in general terms, the aim is to end up with a minimum 25m buffer area adjacent to the river that has around 50-70% native tree cover planted right up to the edge of the riverbank and these banks to remain ungrazed. The remainder of the area that is not under tree cover could be rough grass, shrubs or wet areas with ponds and scrapes. Ideally, where viable, these areas should connect into wider woodland or other ecologically rich areas to create connectivity across the landscape.

Ideally, artificially straightened watercourses should be restored to a more natural sinuous form before the banks are fenced off and planted with trees. However, this may not be possible due to the expense of such projects nor wanted necessarily by the landowner who may see more value in the land retained for grazing or arable use. It is better to protect any stream of any shape than to do nothing because the stream will probably restore natural features like pools, riffles and gravel deposits through natural processes over time, especially if enough space can be given to allow this to happen.

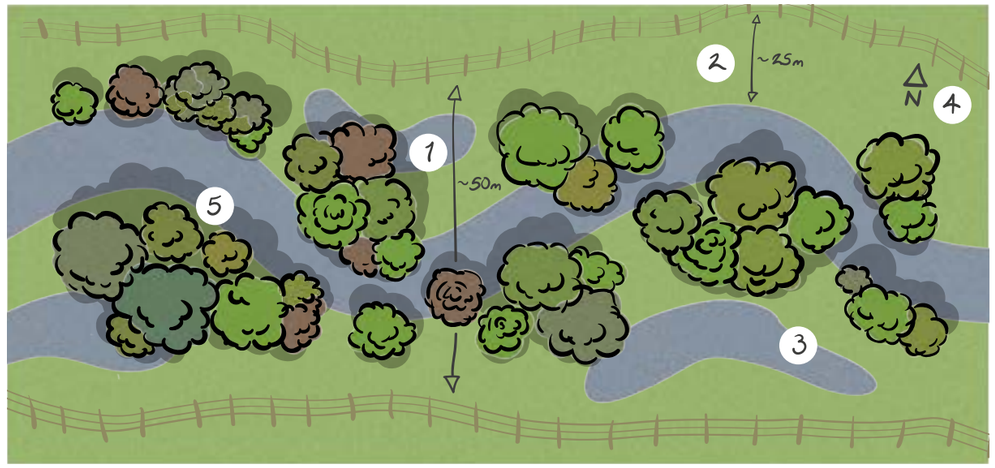
Note that in figure 1, the indicated buffer dimensions should be viewed as the ideal minimum however this may not always be possible. Be mindful though that to be eligible for a Forestry Grant Scheme (FGS), 15m is the absolute minimum that will be considered

The scale here would probably suit a small stream or burn in an arable or improved grassland area but there are some of the key transferable points to note here are:

- The tree/canopy cover is approximately 50-70%.
- The trees are planted right up to the bankside to allow trees to grow out over the water. This will, in time, shade the stream; allow branches to trail in the flow, creating habitat diversity; and the roots and fallen branches will create instream habitat and encourage positive, natural river function.

- The open areas, if not grazed, will develop and form a much rougher surface that, along with the trees, will aid with slowing surface water runoff, reduce diffuse pollution and aid with bank stabilisation.

Figure 1: Riparian planting for shade & climate adaptation:



1. Ideally 50m width, 2. Ideally 25m width, 3. Scrapes or seasonally wet areas, 4. Consider aspect in relation to planting, 5. Ensure trees are planted right into the bankside for maximum effect.

© CMP

Dryhope woodland in early establishment

Key Drivers for Establishing Riparian Woodlands at Scale

There are many reasons to create riparian woodland. However resource and funding are limited and therefore you ideally want your efforts to deliver the maximum output every time. The key is to understand your catchment and know the priority issues and areas within it allowing you to target your effort to achieve multiple benefits and or allow focus areas to be identified. This understanding and focus can also aid funding applications if the evidence for your work is based on sound science.

There are a number of common issues that can be addressed with good native/ riparian woodland.

Reduction of diffuse pollution

While diffuse pollution from sources such as fertilizer application and manure management can be significantly reduced by improving land and soil management in the surrounding area, a buffer of native/riparian area woodland will improve water quality and riverine habitat by interrupting the pollutant pathways.

Poaching by livestock can cause significant issues

Nutrient runoff

Excessive nutrient runoff can cause eutrophication – over-enrichment of the water – which reduces water quality and may result in toxic blooms. The most common nutrient issues are caused by nitrogen and phosphorus that are common in agricultural use.

Significant poaching by livestock
(note the sediment pathway in the foreground)

Sediment run off

This is mostly caused by disruption of the soil surface by cultivation, drainage or trampling by livestock. Sediment run off can lead to silting up of water courses, which can damage the instream ecology and reduce water clarity.

Pesticides

These can harm essential fly and insect life crucial to a healthy river system.

Carbon storage

Trees store carbon as they establish and grow, and their leaf litter and debris increase soil carbon storage.

Riverbank protection

The roots of riparian trees protect the riverbank from erosion by binding the riverbank soils. This also helps protect the instream bed and reduces channel erosion. The presence of roots and trees also helps deflect and reduce water flows, again aiding in the overall protection of the water course.

A wide buffer and planted trees will help stabilise the bankside and water course

Instream habitat

Trees enhance in-stream habitat and processes by helping stabilise banks and encouraging natural process to occur when they or their boughs fall into the water course.

A fallen tree providing valuable instream habitat

Natural flood management

Trees in general, but specifically within the riparian areas, can aid with holding water back during high flows, increasing water infiltration and reducing surface water run off rates. This helps slow the flow of the water course and thus can help towards the reduction of damaging flood events.

Shade and cool water

Trees growing along the banks of water courses provide shade, helping reduce water temperature during sunny periods. This helps offset the effects of global warming and maintain the conditions needed by indigenous aquatic life, including fish such as the salmon.

Well-designed riparian woodland and buffer areas holding back water in high flows

Ecological connectivity

Riparian woodland will be an integral part of a more connected landscape and aid in the movement of wildlife between habitats. It will also enhance diversity by creating habitat hot spots or islands across a landscape. This should be taken into account when planning your woodland to maximise its impact.

Integration with commercial forestry

There is a significant amount of commercial timber production within the upland areas of Scotland to service the ever-growing timber market. Commercial timber is also a useful and often significant business asset within a landowner's landholdings and business unit. We need to move away from the siloed view of commercial verses native and understand there is space for both, and they can be integrated well if the desire to do so exists. Since the 1990s there has been a substantial effort to improve the riparian and 'buffer' zones around the watercourse within commercial plantations however there remains considerable opportunity to do much more.

Commercial forestry riparian zone design has been guided by the Forestry Commission Forest and Water Guidelines since their first iteration around 1990, and the current version is now incorporated into the UK Forest Standard.

UK Forestry Standard

This is a comprehensive document but it's not until p.170 that some guidance is provided regarding what they term as the 'Buffer Area'; that is the riparian strip which is left unplanted by commercial conifer trees.

Table 6.7.2 Minimum buffer widths from forest edge to the watercourse/body or abstraction point

Buffer Width	Situation
10m	Along permanent watercourses with a channel less than 2m wide. (Narrower widths of buffer area may be allowable along minor watercourses with a channel less than 1m wide, especially on steep ground.)
20m	Along watercourses with a channel more than 2m wide and along the edge of lakes resevoirs, large ponds and wetlands.
50m	Around abstraction points or provate water supply, such as springs, wells, boreholes and surface water intakes.

The UK Forestry Standard Requirements are divided into legal requirements and good forestry practice requirements. It is worth reading all of section 6.7 Water. This contains a wealth of information on the policy and regulation context of all aspects of water within forests. However, most of the aspects of forest riparian design for which you may choose to influence is under the 'good forestry practice requirements' – SEPA being the regulatory body regards legal requirements.

By building good relations with Scottish Forestry and the commercial sector within your area, this should give you the opportunity to point out to forest investment managers and planners that although the standards minimise negative impact to our watercourses, they could and should, be used to maximise positive impact. The general idea being to maximise positive impact on the watercourse via well designed native riparian planting and crucially, with a long-term establishment and maintenance plan to accompany it. Further, it may allow the option to encourage the installation of large woody debris in rivers and leaky barriers being installed and relating new developments with flood risk (see p.186 under 'peak flows and flooding').

Understanding and Engaging your Client

Ideally, all projects will be driven by their priority need but the reality is that you will also need to be opportunistic, adaptable and be able to compromise, as what is the ideal and what is actually achievable are often two different things.

Before approaching a farmer or landowner, you need to do some homework to get to know the issues they may be facing and the opportunities on the land they own and or manage. Remember too, that you must take into account the surrounding area and how any changes in land use you propose could fit within the wider vision you have for the catchment.

Engagement of interested parties is crucial

It is vital to have a clear general end goal of what it is you wish to achieve. In its simplest form this may be planting native trees to improve riparian habitat. However, you must also always be looking, where possible, to add value to the business holding whilst still achieving your end goal. Opportunities for the farmers include biodiversity benefits such as increasing pollinator habitat or wetland habitat, targeted fencing and planting to aid with bio-security and livestock welfare (e.g., Johnes disease in water, TB in cows and nose-to-nose transmission,) agri-environment payments, FGS payments, compliance with Good Agricultural Environmental Conditions (GEAC)/ SEPA regulations or SEPA water body failure, carbon payments, shooting habitat, fishery enhancement, obtaining value from areas excluded from single farm payment e.g. gorse, thick bracken.

This section outlines the steps you should take to get to know your client and their business and to develop the shared vision for the work to be done.

Do your research

- ✓ Get to know the farm. Find out what you can about the client and their drivers/ priorities, through reputation, neighbours, google maps, farming press or other contacts (e.g. agricultural advisors).
- ✓ Search for farm subsidy payments via a payment search engine using the postcode search option.

CAP payments search

- ✓ Think about what you are seeing. Is the farm tidy or messy? What type of farm is it, e.g., arable, livestock, mixed? Where does the landowner/farmer get their satisfaction? What are

their aspirations? Show an interest in the farm, especially in livestock, as this is where many farmers' passion lies.

✓ Try to make connections. How is the business set up? Is the farmer the owner or a tenant? Have they recently started farming or are they nearing retirement?

✓ Have a general idea of the main market prices for livestock and arable crops and how they are trending before speaking with a farmer. The markets section of Farmers Weekly is a good source of this type of information.

✓ Connections are strong within the landowning/farming community so tread lightly and use discretion.

Try to identify the best time to speak with the farmer/ landowner

- Farmers are always busy, with little down time. Try to avoid particularly busy times, such as lambing time, planting time and harvest. Accept it may take a few weeks to arrange a meeting, be flexible and be prepared to maximise the time you have with them.

Listen to what they have to say

- Find the common ground and build relations from there. This may mean that you spend a whole morning listening to the farmer's opinion of conservationists or other issues, but this is often the best way to find out what they really think. This will help you to plan and deliver work that meets their needs.
- There are times when the client's opinion on sensitive or professional subjects does not match your opinion and you may have to assess the risks for the project against professional integrity - a call that may sometimes be required.

Try to understand their business

- Try to align your aims and offer additionality to their business at the same time. For example, can planting trees remove sediment pathways that regulatory bodies may be unhappy with? Can you integrate trees that will help achieve your aims and that also provide benefit to the landowner, such as increasing sporting habitat, providing shelter to enable stock to leave the sheds earlier in the spring and thus reduce input costs.
- A good example of how additional benefits can be achieved is the Pont Bren project:

  ⇆ Pont Bren project

Offer an incentive

- You will need to have something to offer, such as knowledge or access to grant or funding sources, new fences, carbon payments, etc. It is unlikely that planting native woodlands can ever bring in an income similar to commercial conifer woodlands. However, with increasing awareness of the value of natural capital it may be that 'environmentally positive aspects' of land holdings will have substantially more future value. Many forward-thinking landowners are currently completing natural capital audits with this in mind.

- If a landowner wishes to undertake some planting, you may offer to complete the whole process on their behalf, removing the hassle and complexity, and deliver it at a cash neutral basis to them (see delivery model example below).

Have a clear delivery model

- It is essential to have an adaptable core delivery model that is simple to follow and for the client to understand. An example of this may be to offer to complete all applications, secure funding and deliver the schemes on the ground to the end of the capital phase and to do this on a cash neutral basis, if not also giving a return, for the landowner. This has been a successful model that the Tweed Forum has followed for many years.
- Be aware that from first contact to actual delivery on the ground may take between 6 months to 5 years so you need to be realistic with your timescales and your model needs to be adaptable to this. Land managers will often need time to consider and adjust their operations to adapt to the changes proposed. There may also be existing schemes such as Agri-environment Climate Schemes (AECS) that may need to finish before other plans can be initiated. Be mindful of how these timescales may impact on your delivery mechanisms as often funding is time constrained and you may need to work tirelessly to keep the project timings and funding timings applicable to each other.
- A core model should be adaptable and flexible enough to enable delivery over various landscapes and utilising all available monies. Ideally, it should also build in a funding mechanism to give a return to the 'facilitator'. Above all else it should be clear and transparent and avoid ambiguity.
- Compromise is key. It is unlikely that you will ever deliver the 'perfect' scheme as there are many competing land interests so you will need to know how and where to compromise. This should not be at the cost of the overall integrity of the outcome, but it may be that the maximum can't be achieved for every aspect of a scheme.

Success

- If you get to the point of looking at land holding maps and discussing options, then you are over the first hurdle. Remember that this may end up being the first of many phases of work with the landowner/manager and this may continue over many generations as landscape change is a long-term game. As such, building relationships, becoming trusted and known for being a trusted intermediary is vital for ongoing success.

A successful planting scheme 5yr after planting

- Obviously not every opportunity will progress, but it is good practice to work on always trying to leave the door open as grants, priorities, opinions change and keeping the relationship alive by checking in every so often can pay dividends in the long-term. A 'No' can often turn to a 'yes' when changes are seen to be occurring on neighbouring land.

Understand Potential Land and Design Constraints

Once you have engaged the landowner and they are open to considering options for tree planting, what next?

With the correct soft skills you will, ideally, end up with a map and either areas for consideration marked up by the landowner or the landowner has asked you to suggest the most appropriate areas for consideration. It is useful to have the map prior to your site visit but this will not always be possible. However, at some point you can carry out a number of searches that will help you identify potential issues and constraints that need to be investigated further to aid with the best design and planting options. Significant constraints commonly identified that can prevent planting will be areas of peat, archaeology, designated sites such as SSSI or SPAs and ornithological issues such as raptors or wading/ground nesting bird habitat. Remember that, while planting native trees has its benefits, there may be times when planting trees is not the correct thing to do.

Tree planting should avoid areas of deep peat

UK Forestry Standard (UKFS)

The United Kingdom Forestry Standard (UKFS) is the reference standard for sustainable forest management in the UK. It outlines the context for forestry, sets out the approach of the UK governments to sustainable forest management, defines standards and requirements, and provides a basis for regulation and monitoring – including national and international reporting.

You should be familiar with this document and ensure your schemes meet the required standards and regulations. Note, however, an approved FGS adheres to the UKFS by default which is why good relations and effective communication with your local woodland officer is essential.

The UK Forestry Standard

Integration with other agri-environment schemes

There are times when existing agri-environment schemes exist on land which you might like to see planted. For example, where a farmer or landowner is receiving payments for organic conversion. In this situation it may be possible to arrange to have a 'derogation' so that the organic payments are given back to Scottish Rural Payments and Inspectorate Directorate (SGRPID) (not ideal and will take a bit of paperwork but may be worth consideration) or you plan your delivery timings accordingly for once the area is no longer under the current engaged scheme.

Another example in the Borders was where a farmer had previously fenced off a narrow riparian zone via an environmental scheme. One of the conditions was that the field adjacent to the water margin had to be kept grazed despite no payments being attached to this condition. A derogation was granted and 6 ha of new native riparian woodland planted.

Remember though that we should not be replacing one significant habitat, such as species rich grassland, with another, so sometimes a call is required to leave land as it is and or encourage the landowner to manage the land in a complimentary manner to the habitat that exists.

Desk work

TOP TIP

A point to note is that any desk work should, where possible and if appropriate to do so, be ground truthed during the site visit.

Ideally, it is recommended, prior to your visit, that the landowner will provide information to allow you to identify the area of land you will be looking at or even just the land unit area. This will allow you to carry out some desk top work enabling you to go armed with details to aid your discussions with the landowner and your walkover.

A riparian strip delivering multiple benefits

Information that can be gathered prior to walkover includes river temperature data, regulatory governance (e.g., SSSI, SAC), habitat designations (e.g., wetland, species rich grassland, soils/peat). Remember too that the landowner, especially farmers, may have extremely detailed soil analysis of their land holding so remember to ask them.

A look at some aerial photography and maps of the farm should show you the watercourses in the area. You can assess their condition during your visit to the farm.

Check any locally relevant sources of information, such as The Wildlife Information Centre (TWIC) that covers south-east and central Scotland. Some of these may charge a small fee but the cost may be worthwhile if it helps you avoid proposing planting the wrong trees in the wrong place.

There are numerous sources of information about land in Scotland and its uses, both present and historical, and on ecological factors that may influence tree planting plans.

These are an invaluable starting point for planning any tree-planting projects and help build a picture of the land you will be viewing and the wider landscape beyond.

Mapping

The use of computer mapping (GIS) and its associated programmes is now very much standard practice in many professional practices and no more so than in land use planning. GIS can be a powerful tool for deriving land use strategies and identifying opportunities for multiple outcomes, including tree planting. There are free, open source and commercial options when it comes to GIS packages and there are online resources to aid with learning how to operate them.

Ideally, however, it is useful to have access to a GIS specialist or undertake some formal training to get the best out of them. Certainly, it is useful to understand the basics as this will allow you to produce the required maps for a Forestry Grant Scheme (FGS).

There are many mapping tools and information sources that can help identify your priority areas for riparian planting and it is wise to pull together the data sets for your locality. Some of the main sources may include:

SEPA data sets

SEPA environmental data

SEPA flood maps data

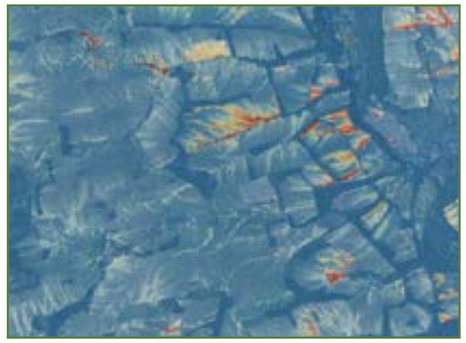
SEPA polution data

Nature Scot data sets

Nature Scot data

Scottish Forestry data sets

Scottish Forestry data



GIS - identifying diffuse pollution source areas to guide potential tree planting considerations

Understand surrounding ground use/constraints to guide the correct planting

Scottish Forestry are also soon to release a reviewed and updated 'Woods for Water' layer that has been refined utilising multiple data sets.

Aerial photographs

There are several websites that provide access to detailed aerial photographs including Bing and Google maps. These can be a useful starting point to assess the type of land you will be walking over, show you historic and present watercourses and give you a wider view of the surrounding landscape.

Resources:

OS Mapping

OS maps are available free on Bing Maps, this can make it easier to highlight watercourses, slope severity, and other points of interest.

Bing maps

Marine Scotland

Marine Scotland

Marine Scotland provides several resources that are useful to anyone planning riparian tree planting. These include:

- A guide on tools to reduce river temperatures, including river temperature monitoring maps:

River Temperature Guide

- A factsheet on Where to plant trees to protect rivers under climate change:

Where to plant trees

Canmore – the National Record of the Historic Environment

The Canmore website provides an online catalogue of Scotland's archaeology, buildings, industrial and maritime heritage. The search function gives access to aerial images, soil and rock maps, and a variety of maps, including historical and current maps.

Canmore Website

This information can help planners avoid areas that may have archaeological or other heritage sites.

Canmore Search…

Scottish Forestry Map Viewer

This online mapping provides access to a wide range of forestry-related information , including FGS Options and Claims and FGS Target and Eligibility Areas, which will be useful in planning tree-planting projects.

Scottish Forestry Map

Wader Zonal Map

The Wader Zonal Map indicates the likely presence of 10 species of wading birds that breed in UK. This may need to be taken into account when planning tree planting projects and related development of wetland areas.

Wader Zonal Map

Resources: (cont)

Native Woodland Survey for Scotland

The Native Woodland Survey for Scotland Data Explorer is an excellent resource for finding out what, if any, native woodland areas of more than 0.5 ha are present in a given area. It also gives a breakdown of woodland compositions and species structure. This can help guide both placement of tree planting and the choice of species to use.

Native Woodland Survey

Nature Scot – Site Link

NatureScot SiteLink provides access to data and information on key protected areas across Scotland, such as Sites of Special Scientific Interest, Special Areas of Conservation and Special Conservation Areas. This is essential information for planning any tree-planting operations.

Nature Scot

Scottish Landscape Character Types Map and Descriptions

This online resource shows Landscape Character Types, that is areas of consistent and recognisable landscape character, e.g. 'rolling farmland' or 'dissected plateau moorland'.

Scottish Landscape

Soil-related resources

The Scotland's Soils website provides several resources that will will be useful for planning any tree-planting project. These include a national soil map of Scotland, soil risk maps and land capability for agriculture maps, and a section on resources for land managers and developers.

Scotland's Soils

The James Hutton Institute is also an invaluable source of information on soils in Scotland. This includes a national soils database, soil maps and information on land capability.

James Hutton Institute

Protected species

Any potential groundworks must take into account likely impacts on protected species. The NBN Atlas provides data on biodiversity across the UK and is a useful starting point for determining what species need to be taken into account when planning tree-planting projects.

NBN Atlas

On site survey and considerations

The FGS covers the whole process of considerations from planting design to application in great detail, but the following are some of the main points to consider when onsite.

Firstly, speak to the landowner as they will generally know their land intimately and they will likely know the location of pathways, where and to what extent areas flood and sensitive areas such as species rich grasslands, SSSI, SACs, wader habitat etc that can be useful to back up your desk top work. It's not to say these designations always prevent tree planting but they will have to be fully considered and may affect what is achievable, final woodland designs etc.

Once on site, it is useful to have a walk over the land under consideration with the landowner. This might not always be possible, but before agreeing a finalised plan you will have to walk the areas under consideration to agree final fence line positioning, crucially, gate positions and to ensure the landowner knows exactly what you are applying for on their behalf and what adaptations to their working practices they may need to make.

A GPS unit is an extremely useful bit of kit and should be used to record potential fence lines, areas to avoid (e.g. areas of peat). This can then be downloaded to your GIS system once back in your office. If you do not have a dedicated GPS unit, you can use an app on your tablet or phone, such as **Avenza Maps** and **ArcGIS Field Maps**.

Avenza Maps

ArcGIS Field Maps

Ensure you have reasonable scaled plans suitable for the land area under consideration. Walk over the land ensuring to ground truth points for consideration from the desk work. Make detailed notes of the site, indicating potential fence lines and noting areas where further information or conversation with the landowner is required.

TOP TIP

It is not always advisable or productive to make the point that the extent of riverbank poaching by cattle or sheep is likely to be a breach of the Good Agricultural and Environmental Conditions (GEAC) or General Binding Rules (GBRs). However, you can use these areas as a discussion point with the landowner and to guide your work/designs.

Look at the site not only in terms of design but also from a more practical delivery aspect. Consider access for machinery, location of fencing in relation to potential issues such as dykes and water courses and location of overhead cables. Also, identify where materials can be stored if needed and whether deliveries be made easily to site or will require specialist machinery. Consider whether minor design tweaks could make delivery of the scheme simpler and easier, thus saving money.

Fencing

Think carefully about where to position fence lines (especially where deer fencing is being considered) to minimize visual impact on the landscape. It may take several rounds of revision to come up with a design that is agreeable to the landowner and that is acceptable to the woodland officer and any statutory consultees.

Try to avoid fence lines that cross steep or rocky ground; crossing such areas will be more expensive and the fences may be weaker in these areas. Consider existing fences and where you could tie into them. This may reduce the overall cost but be wary of relying on worn-out fences.

One point to note is to try and avoid having high ground points immediately adjacent to a deer fence on the outside as this can provide a point from which deer can jump over the fence. If the situation is unavoidable, you may need to modify the fence at this point. A good contractor should be able to advise on bespoke design to address these issues.

Consider how the scheme fits within the areas you are considering. Are you straddling the river? Will you need water gates? Where is it best to site any water gates? Are there natural features, e.g., rocky outcrops or gorges, that you can use to enhance their effectiveness? Will deer fence work (e.g., if in high energy flood plain) or would stock fence and tubes be more suitable? Are rabbits present? What is the deer management regime?

Skilled contractors are essential

Determine whether livestock need access to watercourses. Be aware that concentrating them into a short length could make poaching of the ground worse. You may have to investigate gravity-fed troughs or alternative watering systems to avoid such problems but note that these are expensive and not currently covered by FGS funding.

The ideal fence location and the reality to where the fence has to go are often different and compromise will be required. This is something that you get a feel for with experience, but the local woodland officer will consider and advise on this during the application process. This may also require negotiation with the landowner as your requirements to make the scheme work and what the landowner wishes may differ. Remember, there will always be compromise.

Soils

Knowing the type of soil is vitally important. The Forestry Grant Scheme will not fund trees where they will not grow and thrive. This includes planting on peat deeper than 50 cm but in reality, we should be avoiding planting all peaty areas. Allowing regeneration of willows and birch on wet peatlands to create bog woodland may be the rare exception.

It is always useful to take a spade with you to dig some simple soil pits and a soil/peat probe if you know areas of peat are likely. It is important that you know the basics of what you are looking at when it comes to soils: Is it wet/waterlogged (seasonally or otherwise)? Is it a gley? Is it free draining? Is it sandy, clay etc? This will be crucial to selecting the right species to plant. All this information should be written down or recorded electronically for future reference.

⇔ Soil Association

The Soil Association is a good place to start when looking for training courses and information on soils.

Remember too, that you should derive some of this information from your desk search.

Potential planting areas

You may wish to mark these onto your map/s indicating differing soil types (wetter or drier areas, if nothing else) and ground vegetation as this will help guide your planting design at a later stage. Look for areas where there is a potential to link up with existing habitats such as woodlands, wetlands, species rich grasslands etc. or provide ecological 'islands' to enable more connectivity over the wider landscape. Some of this should have become apparent from the desk work.

Understanding soil conditions is critical to ensure successful tree establishment

Restrictions

Mark up any areas that might restrict either planting or operations. This may include boggy areas, areas of peat, ditches, badger setts and physical structures such as pylons and gas, electric or water pipes. These will need to be taken into account when designing the site and developing operational considerations.

Utilities

Carry out comprehensive checks as to any utilities infrastructure that may be within your operations/planting area or that might affect operations. For example, if you need to cross a gas line with heavy machines to access your working area, you may need to put in place measures to reduce ground disturbance or compaction or you may need to identify another access route, if possible.

The landowner is likely to have a good knowledge of any utilities infrastructure that may be located on their land, both above ground and underground so ask them first. Be mindful to look for markers or indicators as to underground utilities. Following this, contact providers individually or use companies to complete cross-sector searches on your behalf. Companies such as BeforeUDig will check among its membership for utilities infrastructure and provide information accordingly. Importantly, it can provide a list of providers it has not checked against or that have not responded so you can approach them individually.

Remember to collate any maps and information gathered and track responses from each provider.

The information received will then need to be incorporated into your design to avoid operational and or future issues. Any services identified should be marked out on site to avoid operational mishaps.

There may be fees associated with some of these searches/search providers but if you are a charity, it is worth asking if these can be waived or reduced.

Given the costs involved, you may consider completing these checks at a point only when there is a degree of certainty around the schemes progressing to delivery.

As things progress, this information should be passed to prospective contractors who may be tendering to deliver the scheme to allow them to price accurately. However, the winning contractor should always do their own due diligence.

Species choice

Getting the right trees in the right place is vital.

The most useful publication to start off with is Creating New Native Woodlands from the Forestry Commission.

Bulletin 112

Although first published in 1994, this Bulletin contains all that you need to make a start designing a new native woodland. The section on National Vegetation Classification woodland types lists the plant species you are likely to see for each type of new woodland. This 'precursor vegetation' will indicate what species of trees to plant.

Another great source of reference is the Woodland Trust's Tree species handbook.

Tree species handbook

© CMP

Correct species choice will ensure newly planted trees survive

Obviously, on ploughed or improved grassland, most of the species diversity has been lost, so the soil characteristics must then be relied on to indicate what species might be suitable. The dampness of the soil is very important. Remember to refer to your desk work and information gathered from site and the landowner regards soils and how they may relate to tree species choice.

Always look around the area you are scoping for existing trees and shrubs and see which species are doing well in which places.

It is advisable to note down species considerations when on site to aid as a reference memoir later.

Initial design thoughts

The ideal design and what is achievable are often two different things. However, we should always be looking to design the woodland as best we can to make it look as natural as possible within the landscape. Keep in mind what it will look like in 50 to 100 years.

When on site initially, look at landform, try to visualise where and how your woodland may sit within it and what you can do to tweak the design to make it blend in more naturally. Obviously, fences will tend to create unnatural straight lines. You can mitigate this by using the land contours as best you can. You can also feather the edge of your planting and vary densities so that, as the fences get removed, the woodland looks more natural. This is easier to achieve if planting at scale.

It is useful to make sketches and mark up plans to show planting areas and or existing habitat as a reminder for when you formalise plans back in the office.

TOP TIP

Today's technology makes recording site information very simple. Take lots of photos and if possible, get some drone footage of the site and surrounding areas; this is especially useful on larger sites.

Back to the office (design)

Once back in the office, download the GPS data (or tablet/phone data) and review with your notes and desk-study information. This will form the basis of your planting plan for consideration by the landowner. This should be kept reasonably simple but should show exactly where the fence line(s) will be, the woodland cover and open areas. Your plan should provide the basis for an FGS application, but if you are still learning the process, it might be beneficial to work with the woodland officer from the local Scottish forestry office to ensure you have not made any glaring errors.

Start by marking out fence lines, noting whether they are stock or deer fencing. Mark up constraint areas, leaving buffers where required (you may be able to incorporate some of these buffers into your 'open ground' allowance – see later).

By default, a design plan is formulating, i.e., you have marked in the limits of your area - the fence lines, and ground constraints (non-suitable planting areas such as peat or species-rich grassland, archaeology, SSSI, hard/utility infrastructure etc) that, by definition, start to identify where you can consider planting. This can then be firmed up ready for consideration. Note, this is nowhere near a finalised design, but you should be able to determine your approximate features, such as the area to be planted, number of trees and outline species mix, fence specifications and lengths, gates required, likely ground preparation techniques and maintenance requirements. Bear in mind the parameter requirements of the FGS to ensure the scheme will be valid or to identify where some tweaking of the design or discussion with the woodland officer will be required.

At this stage you should develop a budget for the plan for the landowner to consider. This should include all monies available under FGS and other contributory finance options, if available, e.g. wind farm monies, carbon credits, etc. It should show the expenditure based on best estimates and ideally should be cash neutral or cash positive for the landowner. Although not a finalised budget, it should be as accurate as possible in relation to the proposed design (see Finances: Making them work for an example budget).

Remember, if applicable, to include your fee for the service provided. Be open and honest about any fees; you are trying to build a relationship, becoming a trusted intermediatory. It may be that you can cover your time under wider project funding. Try to include such project costs when drawing up project funding requests (e.g., for National Lottery Heritage Funding, Nature Restoration Funds etc), as this will make schemes financially more attractive to the landowner/manager.

Send the design and budget to the landowner for consideration and further discussion.

Once you have the landowner/manager's feedback, make any necessary adjustments to the design and budget and get a record that the landowner is happy for you to proceed on the basis of the agreed design. Nothing is as yet set in stone or fully committed too until FGS agreements are signed. Inevitably sometimes designs will need to change either as the landowner changes their minds, due to consultee feedback or to meet guidance requirements. However, the more accurate the design is at the start of the process, the simpler it will be to complete the process.

Following positive feedback from the landowner then engagement with the local woodland officer at an early stage is crucial. This will enable any significant issues to be identified and allow engagement with the relevant bodies/consultees such as RSPB, SEPA, Nature Scot etc. at an early stage to iron out the problems in terms of site design and development prior to formal submission.

It is helpful to develop good relations with the relevant officers at those bodies that are likely to be significant consultees on most schemes. This may be the likes of the RSPB and NatureScot. That way, you can supply information for informal feedback early on in the process. This can save time later and reduce the potential for negative consultee feedback during the formal consultation period.

It may be that during either initial consultations or the formal consultation phase that significant issues are identified or raised by consultees. Early engagement with these parties is essential to find suitable solutions and avoid submitting a scheme that will not be approved. Sometimes the reasoning for the objection may be substantiated and therefore a substantially revised scheme is required or an acceptance that planting may not be suitable at all for the site: we should not be ruining one significant habitat for the sake of another. However, sometimes negotiation can bear fruit and an acceptable solution to all can be agreed that further enhances the environment and meets multiple goals.

Always revise you budget after initial consultations and following design revisions. Discuss the changes with the landowner and make sure that they agree to them.

If there are no insurmountable issues and the landowner is happy, you are ready to proceed to a formal submission.

Applying to the Forestry Grant Scheme

The simplest way to learn how to apply to the Forestry Grant Scheme (FGS) is just to start an application and work through it, using the online guidance and, where necessary, your local woodland officer to progress one step at a time.

FGS online guidance

The application can be saved as you progress, and nothing becomes live until you hit the submit button. As with all grant applications, it can be tedious and feel overly complex and the first attempt will take time and patience. However, with experience, you will become very proficient in a short space of time.

Forestry Co-operation (FOCO)

A little used option in the FGS is the Forestry co-operation (FOCO) grants.

FGS Forestry Co-operation

This option aims to encourage landscape-scale collaborative projects between two or more landowners by providing support for project facilitation and co-ordination. The subsequent management activity can be supported through other options within the Forestry Grant Scheme.

In the most basic terms, if you are looking to work on a small scheme of less than 10 ha over two differing land holdings (Business Reference Number holders - BRNs) or on a larger scale over four differing land holdings, then you may be able to submit a simple FOCO application. If successful, this will allow the facilitator to draw down monies to facilitate officer time to engage and develop potential schemes across the engaged holdings. This can reduce the cost of the overall project for the client and brings funds into the facilitator's organisation.

Woodlands for Riparian uplift

Where applicable, if you fall within the 'woodlands for riparian benefits' target areas then you may be eligible for an enhanced area and maintenance payment rate that could make a scheme more financially attractive.

Woodlands for Riparian Benefits

The proposed new woodland must be likely to provide multiple benefits to the riparian areas and be identified as being within the 'Woodlands for Riparian Benefits' target areas in the FGS Target and Eligibility Areas' folder on the Scottish Forestry Map Viewer.

The higher payment rates will apply to the following woodland creation options:

- Native Scots Pine
- Native Upland Birch
- Native Broadleaves
- Native Low-density Broadleaves

The woodland must support river management, water quality, flood mitigation and/or the Wild Salmon Strategy and the benefits must be clearly identified in the Woodland Operational Plan in both the General Assessment and Management Operations sections.

The additional target area rate is applied at an option level within your application. For example, if 50 per cent or more of each eligible option area within your application is within the target area, then the whole eligible option area will receive the higher payment rate. If less than 50 per cent of each eligible option area within your application is within the target area, then the higher payment rate will not be applied.

The identified target areas are 50m in width either side of the river in respective areas and as such the 50% rule for eligibility (see above) needs consideration. The eligibility criteria can be restrictive if you are looking to access the higher payment rates so there is a need to balance the overall scheme aims and objectives, in relation to the standard payment rates available for this, compared to a scheme designed to meet the target area eligibility.

Get to know your way around the FGS online

The following links give you all the details you require to complete and file an FGS application for woodland creation

Woodland creation

Starting point

The best starting point is the online guidance to preparing an application:

Application Guidance

Supporting Information

Guide for Land Managers

Further Links

These links provide additional information on the application process

Full scheme guidance

Application process

Woodland creation

FGS options guide

SF map viewer

Additional considerations

Get yourself registered as an agent:

Before you start your application, you will need to be registered as an agent through the SGRPID on-line portal. This is a one-off registration.

Rural payments

Register

TOP TIP

Get to know the helpful staff at your local SGRPID office.

Ensure the land you are applying for is registered

The farmer and farm you work with will hopefully be registered through the Rural Payments and Services system. If not, help the farmer to register their land. This can take quite a few months to achieve, so be mindful of knock-on effect of project timings. However, you can progress an FGS application whilst waiting for the land to be registered. In this case, speak to the local SGRPID office and they will advise on temporary land registration.

Rural Payments tutorial

Get mandated

You will need a mandate to become an agent to submit an FGS on behalf of the farmer. This requires a completed business mandate form PF05, with a signature from the farmer and you.

Business Mandate

There is then a process of online authorisation. You will need to liaise with the landowner over this.

When you do eventually get mandated, you will then get restricted access to the farmer's on-line farming account and be able to construct the details of the application, upload maps and other documents and download a draft 'Schedule of Works' which will show how much FGS capital grant and maintenance money you should be able to claim. You can then use this information to refine the FGS Budget for the overall operation.

Environmental Impact Assessment

An Environmental Impact Assessment is used to determine whether consent should be given for any work to go ahead. This is an important step and will identify any potential issues that may need to be addressed. Although schemes employing native tree species are more sympathetic and compatible in terms of landscape impact, there are certain factors that can influence scheme design and delivery. Again, early discussions with the local woodland officer should help identify if there will be any major considerations.

For detail on threshold areas and the Environmental Impact Assessment regulations, see the link below:

Impact Assessment

FGS detailed considerations

Value for money

A point to note is value for money (VFM) criteria (see below for explanation taken from website):

> *The presumption is that fencing will be the preferred method of protecting new woodland. However, tree shelters may be supported where they are a lower-cost option.*

> *In all woodland creation cases, we will assess both the silvicultural appropriateness and the benefits to be delivered by the scheme to determine whether the proposed protection costs represent value for money. In cases where they do not, we will limit the grant contribution for protection and may request that you revise your proposals.*

> *Where tree protection capital costs (i.e. fencing, gates, tree shelters) are exceptionally high and more than 150 per cent of the total capital cost for initial planting (i.e. the area payments x the area being planted) please contact your local Scottish Forestry conservancy office in advance before submitting your application. Applications with high protection costs, over 150 per cent of the total capital cost for the initial planting, may still be supported where additional or exceptional scheme benefits are clearly identified.*

What must be remembered here is often riparian schemes are, by their nature, long thin areas where deer fencing with rabbit netting and vole guards does not stack up against stock fencing and tubes in terms of VFM even though the deer fencing option may be better for establishment, reduction of plastic and liability to damage if within a flood zone. In these circumstances, it is worth discussing with the woodland officer to negotiate the 'best' solution. It may be that they only agree to fund the fencing at a stock-fencing rate but agree to the use of deer fencing. This is where blending other funds may be utilised to cover the cost difference and allow deer fencing to be installed.

TOP TIP

Planting at scale helps to reduce considerations regarding VFM and will maximise impact on the ground and generally make the finances more attractive.

Fences and tree protection

Despite decades of wrangling and handwringing over deer densities and the issues thereof, the only outcome has, ironically, been an increase in deer numbers. Most of the discussion generally, is about red, sika and fallow deer (herding species) and very little about the roe deer (non-herding species) that exist in large numbers in southern Scotland.

Trees protected from browsing in 1.2m tubes

Regardless, deer are one of the main issues that need to be considered for any planting operation as they can cause significant damage to trees during establishment and prevent any natural regeneration. As such, protective measures need to be suitable for the site, robust and maintained.

Ideally, you want the tree (see also tree seed/provenance section) to be planted and exposed to the environment within which it is expected to grow and survive as soon as possible. Therefore, where possible, this should be done within an area that is deer fenced with rabbit netting and the trees protected with vole guards or unprotected, if the site conditions are deemed suitable to do so.

Fencing and tree protection are some of the most expensive components of any scheme and often the project expenditure restrictions may drive the finalised design options as opposed to the 'ideal' solution. This is where having a standardised budget sheet can be useful for comparing various options for delivery.

Protection choices

Assume there are always going to be deer, rabbits, hares and voles, so the basic choices are between:

- Deer fence with rabbit net and vole guards (20cm) and canes, or trees planted unprotected if voles are deemed not a threat.
- Deer fence (without netting if hares and rabbits are deemed not significant) and vole guards (20cm) and canes or trees planted unprotected if voles are deemed not a threat.
- Deer fence with individual 0.6m–0.75m tree tubes/spirals/wraps and stakes (generally an expensive option).

Recently installed Deer fencing

- Stock fence with a mix of 0.6m and 1.2m tree tubes with stakes.
- No fence with a mix of 0.6m and 1.2m tree tubes with stakes or lesser or no individual tree protection. This will require a robust deer and vermin management plan to be agreed with the landowner and the woodland officer prior to submitting the application and is not without risk – albeit arguably the options we should all strive for.

If you are planting over several areas you may need to use a combination of these options. Note also that these are not the only options available but just a simplified explanation of the general basic options.

TOP TIP

If possible, get the fencing specification agreed with the woodland officer prior to contract tender.

The "stock fence with tubes" option will not eliminate deer browsing and close monitoring of the site will be required. This option should be the last resort where red deer are present, without additional deer management, and used for small areas only.

Remember that livestock should normally be excluded from areas planted with trees in the establishment phase (a minimum of 20 years).

In general, if you get scale, then the finances are easier to stack up favourably and arguably, the site can be delivered utilising more favourable techniques, e.g. without tubes and behind deer fencing, which can be useful to bear in mind when in initial discussions with the landowner.

Deer and rabbit fenced areas need to be patrolled regularly for deer, hare or rabbit incursion. This will need to be arranged with the owner or as part of a maintenance programme.

The FGS has specific requirements for deer fencing

⇆ FGS fencing requirements

and provides a technical guide to deer fencing:

⇆ FGS deer fencing guide (pdf)

You must follow these FGS deer fencing design details closely because there are a few pitfalls that can be expensive to remedy, such as using the wrong size of mesh, total height of fence, hinged or locked joint mesh. It is useful to discuss any issues with the Woodland Officer to clarify details. One thing you must avoid is an additional line wire above the mesh, as this acts as a snare for deer trying to jump the fence.

Even where deer fences are used, it is important to check for deer incursion, and to have a way to remove deer quickly. Driving deer out through a gate is rarely effective, so culling may be required.

Badger gates will be required in the fences if badger sets have been identified either within the site or nearby. These are available as a capital item under the FGS. Ideally, these should be sited on identified badger pathways. However, badgers will often dig under the fence elsewhere once it has been constructed. These breaches can allow rabbits into the site and should be repaired as soon as possible. If breaches continue in the same place, it may be easier to install a new gate or move one that is not being used.

Tree tubes

In general, tree tubes are most commonly used in conjunction with stock fencing. They are also essential for keeping deer (and rabbits and hares) off young trees where deer fencing is not being used or where it is but without rabbit netting and rabbits and hares are present.

Future thought must be given to tube removal once they have served their purpose

The tubes come in varying sizes from 0.6m to 1.2m and varying diameters, such as shrub shelters that are essentially 0.6m tubes with a much wider diameter. Tubes are also available at 1.5m and 1.8m but these are not widely used and not recommended.

Tubes need to be supported by a stake. These can be hardwood or softwood and should be of a length sufficient to support the height of tube being used. The finished stake height should be below the top of the tube; where stakes protrude beyond the top of the tube, these should be trimmed to length. If using tubes within areas that may be prone to high water levels, use longer stakes and ensure they are knocked in as far as possible and placed on the upstream side of the tube.

Tubes create a micro environment (warm, damp, wind protected) that is ideal for tree growth. However, this can cause accelerated growth especially with species such as alder, willow, rowan and birch, resulting in imbalances in root and shoot growth that, on exposed sites, leaves them prone to becoming unstable and to rubbing or snapping at the fulcrum created by the tube, stake and tie.

There is a lot of discussion around the use of plastic within the forestry sector and there are now many more biodegradable products on the market. However, most do not stand up to the rigors of exposed Scottish sites long enough to allow the trees to establish whilst still being protected. As such, the traditional plastic tubes continue to be widely used.

It is hoped that truly biodegradable tubes will become available and proven soon to reduce plastic use in forestry. Tubex now have their nature tubes and there are also the Next-gen tubes that are new to market and showing promise. Time will tell if these are the next step, but they also come with increased costs/unit, so this needs to be considered if these are the preferred option.

Tree tube removal once the tree is established should be programmed as part of the maintenance regime. However, there is no financial aid for this and often this requirement is 8-12 years after initial planting on exposed sites. However, we should aim, where possible, to remove all tubes once the trees are established and ensure they are disposed of responsibly.

TOP TIP

Alder tend to be less palatable to deer and 0.6 m tubes will suffice for this species.

Spirals/wraps

Spirals and wraps can be used on sites where deer pressure is minimal but rabbits, hares and voles are present. Both these products are generally held up with a cane. Again, consideration around the material construction is required. With wraps especially, the trees can be prone to damage from rubbing along the edge of the wrap itself.

It is always advisable to calculate the financial cost of rabbit netting the planting area verses the cost of individual tree protection along with the practical benefit of trees establishing better without spirals or wraps.

Vole guards

Vole guards are essentially short wraps to protect trees from voles. It is hoped, like other products, that these can soon be made for a truly biodegradable material that is also robust enough to be suitable for purpose. Vole guards can be simply pushed into the ground, but ideally, they should be held in place by a cane.

On some upland sites, there may be too few voles to warrant use of vole guards. Elsewhere, the reduction in cost or use of plastic may offset the slightly higher establishment failure rate.

Tree protected by a vole guard

Guide to suitable species/guard use						
Trees (common)		VG	Spirals	Shrub Shelter	0.6	1.2
Alder	*Alnus glutinosa*	✓	✓	✓	✓	✓
Aspen	*Populus tremula*	✓	✓	✓	✓	✓
Birch (Downy)	*Betula pubescens*	✓	✓	✓	✓	✓
Birch (Silver)	*Betula pendula*	✓	✓	✓	✓	✓
Cherry (Bird)	*Prunus padus*	✓	✓	✓	✓	✓
Cherry (Wild) - (Gean)	*Prunus avium*	✓	✓	✓	✓	✓
Crab Apple	*Malus sylvestris*	✓	✓	✓	✓	✓
Oak (pendunculate)	*Quercus robur*	✓	✓	✓	✓	✓
Oak (sessile)	*Quercus petraea*	✓	✓	✓	✓	✓
Rowan	*Sorbus aucuparia*	✓	✓	✓	✓	✓
Scots Pine	*Pinus sylvestris*	✓	✗	✓	✗	✗
Willow (Bay)	*Salix pentandra*	✓	✓	✓	✓	✓
Willow (Eared)	*Salix aurita*	✓	✓	✓	✓	✓
Willow (Goat)	*Salix caprea*	✓	✓	✓	✓	✓
Willow (Grey)	*Salix cinerea*	✓	✓	✓	✓	✓
Willow (Osier)	*Salix viminalis*	✓	✓	✓	✓	✓
Wych Elm	*Ulmu glabra*	✓	✓	✓	✓	✗
Blackthorn	*Prunus spinosa*	✓	✓	✓	✓	✗
Dog Rose	*Rose canina*	✓	✓	✓	✓	✗
Elder	*Sambucus nigra*	✓	✓	✓	✓	✗
Hawthorn	*Crataegus monogyna*	✓	✓	✓	✗	✗
Hazel	*Corylus avallana*	✓	✓	✓	✓	✓
Holly	*Ilex aquifolium*	✓	✗	✓	✗	✗

✓ *suitable*

✓ *suitable, but look for other options first*

✗ *not suitable*

Gates

If you are fencing, you will need to install gates of some sort. Again, if applying for FGS the specifications need to be closely followed. Remember to consider all user types likely to access the site and specify gates accordingly. Pedestrian gates need to be two-way opening and truly self-closing. See the Forestry Commission Technical Guide, Forest fencing for more information

Technical Guide

Ensure gates are fit for purpose

Not all gates, although FGS applicable, may be suitable for your user types. Care and consideration are required over these aspects and sometimes alternate solutions need to be found.

An example of this was a site where horse riders required access, so time was spent with the British Horse Society local representatives to try to get gates compatible with horse riders and the FGS requirements. In the end, an acceptable gate to all was not found, so horse mounting blocks on both sides of the gates were installed as a compromise (albeit the blocks were not fundable under FGS so alternate funds were required to be found).

As with all aspects of any FGS, it is always advisable to get agreement from the local woodland officer for all the items being installed and delivered under the grant prior to actual delivery.

Doing without fences and tubes

There are large landholdings where deer numbers and grazing livestock are being significantly reduced, allowing for more natural processes of tree establishment to occur. Examples include Carrifran Wildwood, Glenfeshie, Glen Tromi and Creag Meagaidh. However, it is possible for smaller schemes to be established without the need for fencing or tubes.

No fencing, no tubes, just vole guards

An example of this was undertaken by the Tweed Forum with an ambitious and enthusiastic forward-thinking landowner near Galashiels. The farmer had worked with Tweed Forum previously to plant around 60 ha of native trees, either with stock fence and tree tubes or deer fence with rabbit netting and vole guards. They were keen to try to establish native trees with no deer fence or tubes utilizing just vole guards and deer control. This idea came about partly because the landowner dislikes tubes and the plastic and maintenance implications of them, but also from a discussion Tweed Forum and Borders Forest Trust had had with Scottish Forestry and the local woodland officer about the need to reduce plastic use and fencing costs.

Tweed Forum looked at the cost of tubes and deer fences and came out with a figure of c. £2,500/ha on typical sites. Tweed Forum suggested to Scottish Forestry that this money (or some of it) could go to pay for local, targeted and effective deer control however due to restrictions in the system this was deemed unworkable. Nevertheless, the landowner agreed to proceed regardless, and a 20 ha FGS was developed and approved where deer control is arranged to keep deer damage to a minimum for at least 5-10 years during the initial stage. A separate deer management agreement is in place and embedded within the FGS contract which states exactly how deer will be controlled, using qualified named stalkers. The use of thermal imagers for monitoring will be significant in making this strategy possible.

It is hoped this trial will show what can be done with a well thought out and considered scheme that may enable future FGS's to be delivered along similar lines and potentially a funding mechanism to be identified and introduced in future FGS alliterations to make this, arguably more sustainable and environmentally beneficial option, more attractive.

Operational Considerations

Preparing the ground

Good ground preparation and planting technique are vital to the establishment of trees. Ground preparation comes in many differing guises, and the size and soil type of the plot may ultimately decide the most suitable or cost-effective operation to create favourable rooting conditions for the newly planted trees.

Ground preparation on land immediately adjacent to a watercourse is limited to manual screefing, inverted mounding or no preparation and direct planting.

It must also be remembered that ground preparation may be guided by onsite restrictions and damage to existing recognised habitats or priority species must be avoided.

Decompaction

It may be wise to dig a few test pits over the site to check for any areas of serious compaction. If there is consistent compaction within the soil layer, then some decompaction (ripping) may be required prior to planting. This is generally undertaken with a single or double winged tine drawn through the soil below the compaction layer with the lifting movement from the tines breaking up the compaction pan. If there is compaction and it is not alleviated, then the roots of establishing trees may struggle to penetrate the compacted area. This will lead to shallow root plates that may restrict tree growth and, in years to come, may leave the trees much more liable to windthrow.

If there was a compaction layer but you are developing the site using mounding techniques (see below), the process of mounding may be enough to create the planting mound as well as disrupting the compacted layer.

Inverted mounding in a relatively random layout

Compaction can form in many scenarios. However, agricultural fields that have been historically ploughed at the same depth are prone to ‘iron pans’ that need to be broken.

Where significant ground works have occurred, especially if at scale where there may have been significant machinery movements and or large areas of reinstated soils, then the ground should always be checked for compaction. Ideally reinstated soils should be loose tipped and allowed to settle naturally or at the very most, firmed lightly with the bucket of the machine.

Although compaction can be found in most areas, it is more likely to be found on areas managed more intensively for agriculture, areas where recent development/ground works have occurred and or sites where there is historic intensive land use.

Vegetation control

Ideally you need to reduce the competition from weed/grass growth to aid with tree establishment. This can be achieved by spot/line spraying a contact herbicide to create vegetation-free planting areas. If the use of herbicide is better avoided, then mechanical means may be employed. This may take the form of screefing/scarifying or mounding (see below) or indeed the cutting of the vegetation prior to planting. If the site is under agricultural use, grazing it right back prior to tree establishment is another option. Regardless of method used, ideally an area free of vegetation should be maintained around the tree for the first 2-4 years or until the tree is established (see Maintenance section below for further information).

Scarifying

This is where forestry machinery will draw a specialist attachment over or through the surface layers to loosen/expose the immediate soil layer.

Hand screefing

This is where the planter will simply take off a small area of the surface layer with their spade to enable the tree to be planted correctly and install the appropriate protective measure on an area free from vegetation.

This is useful for sites where access for machinery is difficult or restricted, e.g., steep slopes or difficult terrain, or where ground preparation of any other style may be less desirable, such as within the riparian zone to minimise ground disturbance in flood vulnerable areas.

Mounding

The idea with any ground preparation is to make a planting area suitable for tree establishment. This technique is mostly undertaken with a tracked 360 excavator and generally only on sites of 5ha or more where the scale of the works being undertaken balance the cost of this type of operation. You need to bear in mind the cost of bringing such a machine to site, access over and to the working area, the space required to allow work to be complete and operational restrictions on site such as overhead cables, underground infrastructure, and areas of inaccessible or sensitive ground.

Mounding is one type of ground preparation technique and comes in three basic types: hinged, continuous/rotary and inverted.

Hinged mounding

This is where the operator inserts and draws back the bucket causing a turf or sod to lift and then ‘hinge’ back onto the adjacent ground, leaving a raised, hinged mound into which the tree is planted – generally into or next to the hinge area. This technique essentially lifts the planting area slightly above existing ground level, which may be useful for certain species in very wet areas. The negatives are that it leaves a hole in the ground and that the turves can be liable to drying out on exposed sites.

This technique is used heavily for commercial planting

Continuous/rotary mounding

This is essentially hinged mounding but rather than being undertaken with an excavator and bucket it uses a machine drawn attachment that has a number of small buckets on a fixed rotation that creates mounds at set intervals. This is a much quicker technique than hinged

mounding and is therefore cheaper for large-scale planting. However, it does create significant uniformity of spacing and is ideally suited to straight lines or wavey lines, giving to a regimented appearance that may not be desirable for native woodland schemes.

This technique is used heavily for commercial planting

Inverted mounding

This is where the operator inserts the bucket and removes a turf or sod and then lays this back in the excavated hole upside down thus creating a soil planting area that is relatively level with existing ground levels.

At scale, this is a good technique for native schemes. Done well, it can help reduce use of chemicals for maintenance as the need to spray off vegetation is significantly reduced or eliminated.

Choosing tree species

A good starting point for building your knowledge on site assessment and species choice is the Forestry Commission Bulletin 112:

⇔ Creating new native woodlands

The Woodland Trust's Tree species handbook is another good reference source.

⇔ Woodland Trust's Handbook

Try to identify existing natural vegetation species (not easy in winter), wet areas, peaty areas, thin soil and other landforms that may have particular planting requirements. This can then guide you to the National Vegetation Classification (NVC) Woodland type, e.g. W4 Birch woodland with purple moor grass or W17 upland oak-birch woodland with blaeberry.

From the list of recommended trees in the NVC type, make up a list of tree species and percentages of each, assuming you will plant at the density required under FGS of 1600 stems per hectare.

The right trees in the right place

For example, for NVC W11, upland oak-birch woodland with bluebell, the major recommended tree species are sessile oak and downy birch, so start off with 30% of each. Add minor recommended tree species, rowan, holly and aspen, for another 30%, and shrubs, hazel, hawthorn and juniper to make up the final 10%. This is not an exact science, so individual species densities will vary with ground conditions specific to site. As part of the FGS application you should note what type or types of woodland you are creating within your planting area.

Note that an area identified for planting may suit more than one NVC Woodland type and that individual tree species, e.g., birch, are present in many NVC Woodland types, so try not to subdivide the planting compartment too much as you will be swamped with detail. All we can do is make a reasonable judgement about what tree goes where. Time will tell whether we have got it right. Our task is to provide nature with the elements required (reduced herbivore browsing, genetic material, etc.) to allow the natural processes of woodland regeneration to begin. It may be that the trees we plant are just the seed sources for nature to use to get the semi-natural/natural riparian woodland we want.

The current FGS will allow up to 15% designed open ground (OG), so make use of this to create the ideal dappled shade beside the channel. The area for OG is included in the FGS planting area payment, so that can help to balance the budget. Forestry Commission Bulletin 112 also goes into detail about tree species distribution, so clumps of one species can be mixed with groups of many species. Try to avoid planting in straight lines, though this is more challenging when certain types of ground preparation is used.

Sourcing trees

When planting an FGS native woodland, the trees need to be supplied with a seed certificate showing their provenance.

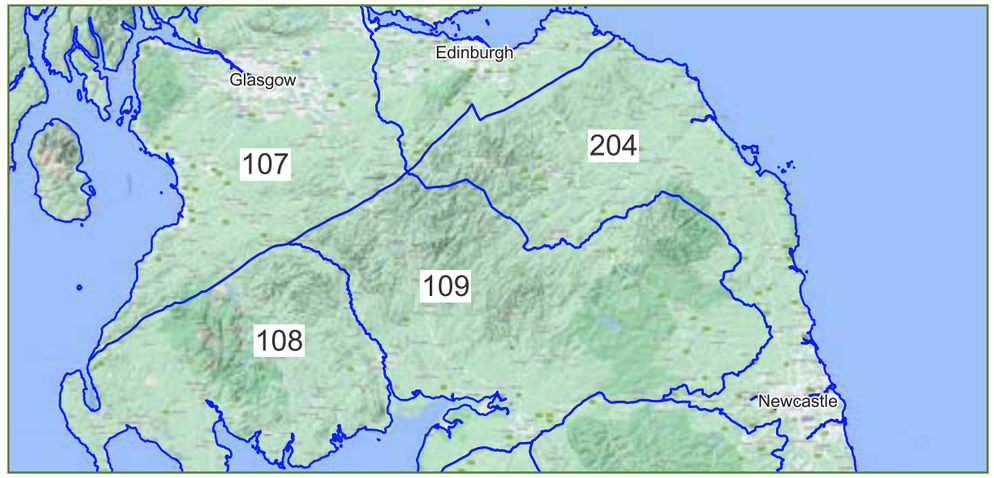
⇔ Scottish Forestry Seed sources

There are many suppliers around the UK who will provide good quality tree stock and you should ask and shop around to find reliable suppliers for your needs. Although not extensive, the Woodland Trust have a list of suppliers who provide UK sourced and grown trees

⇔ Woodland Trust's suppliers

For the Borders, seed sourced from zones 204 or 109 would be the ideal. If none are available from these zones, try to source seed from the nearest zone from which seed is available. In this case, speak to the Woodland Officer at an early stage to give them warning that trees of the most local provenance may not be available. There is a debate on whether the provenance of

Provenance zones for the Scottish borders



trees needs to be so strict in the face of climate change, but FGS conditions should be followed for now.

Scots Pine starting to establish

Some of the provenance zones are quite large, covering areas from mountains to the coast. As such, in some sensitive areas it may be that trees need to be of specific geographical provenance, i.e., from specific glens. In such cases, try to identify the most local seed sources (seed stands) and ask the nurseries if they can supply your specific requirements. If not, you may need to arrange to collect seed yourself and for one of the nurseries to grow it on. This process may take 12-36 months to come to fruition and therefore can have a knock-on effect to delivery timings. As such, early consultation of statutory consultees is essential to allow for concise planning of operations and timings.

UK sourced and grown

Ideally all your trees should be fully sourced and grown within the UK. There is an assurance scheme within the nursey sector that identifies the provenance of stock to buyers and assures that trees have been raised from seed sourced and grown wholly within the UK.

TOP TIP

Source and secure your trees as soon as possible or make sure your appointed contractor has this in hand to avoid potential noncompliance with FGS requirements and operational/timing issues.

Cell grown v Bare root

Trees will be supplied as either bare root or cell grown, depending on the supplier. Generally, in Scotland, the trees supplied will be cell grown as these are more malleable and can essentially be planted all year round, although it is accepted that planting is best done between November and late April. They can be stored easily in a cool, dark, frost-free environment with only some water being required as and when the root plugs feel a bit dry. Cell-grown trees are easier to plant than bare-root trees and reduce the risk of establishment issues due to poor planting.

Bare-root trees are just that, bare root, and may need to be heeled into the ground if they are not to be planted within 3-5 days. Heeling in can be done by digging a trench and lying in the trees that will be in bundles and back filling with soil. This may take a bit of time so some allowance may be required operationally. Also, in very cold conditions, especially if it is windy, care needs to be taken when planting not to expose the roots to the elements to avoid root desiccation. Bare-root trees tend to be a few pence cheaper per tree but require a bit more effort and attention when planting.

Cell grown Alder ready to plant

Planting

Planting is one of the most crucial operational undertakings and trees that are planted badly will have poor establishment rates. As such, using experienced and competent planters is a must.

There are a few differing planting techniques but for bare-root and cell-grown trees, the T or notch technique is commonly used on prepared (mounded) ground or for direct planting. However, given the uniformity of the cell-grown plugs, more and more planters are using planting spikes or speed spades, which can be much quicker than T or notch planting.

Although cell-grown trees can be planted year-round, this is not recommended and ideally all trees should be planted while dormant into frost-free ground. The accepted period for this is between November and the end of March. However, if you are working in northern Scotland, you can extend this planting season to the end of April given the prolonged cooler conditions. If you are planting into April, you may need to carry out a breeding bird survey given birds may be nesting from the end of March. Also, to avoid delays due to bad weather, in certain areas of the country you may wish to avoid January and February, when snow and more extreme weather may occur. This should be born in mind when planning operations to try and ensure smooth delivery on the ground and no adverse knock-on effect to the finances/cashflow.

Maintenance

Maintenance of new planted sites is essential to ensure the trees get established. This will involve vegetation control, checking of fences and tree protection and assessing tree establishment and beat-up rates – that is the replacement of trees that have failed (more on these aspects below).

Fallen tubes after the winter requiring re staking and straightening

It is therefore essential that the maintenance requirement is identified from the beginning of any project, costed and budgeted appropriately.

Maintenance can be built into the overall delivery contract that goes out for tender and ideally cover a period of 3-5 years post planting to ensure all trees are establishing and that the scheme, if under an FGS and or a carbon contract, attains the required levels to ensure the site does not breach its conditions.

In terms of pricing, the contractors are likely to give accurate costs for year 1, followed by estimations for maintenance for the years to follow. Ideally, the maintenance would be agreed annually between the project manager (you) and the contractors following site walkovers in early summer and revised prices submitted for final agreement year on year.

This is a good option to ensure the sites establish. However, this process is arguably more expensive and this may cause issues in balancing the overall project costs. Also, funding can often be obtained for the capital phase but it is much more difficult to build in funding for maintenance over a period of years. Do remember however that, if under an FGS, the landowner will claim and receive annual maintenance payments as part of this contract for 5 years. Generally, the initial payments for years 1 and 2 may not quite cover the actual costs, but

this should be more than balanced over years 3, 4 and 5 as the maintenance costs should reduce significantly as the site establishes.

Good maintenance ensures good tree establishment

Alternatively, the landowner may choose to take on the maintenance themselves. Some will do this well, others less so. Sometimes they may see the maintenance payments as a 'bonus' rather than a subsidy towards required project costs. This though, can be a cheaper option for project delivery and cheaper overall for maintenance if the landowner understands the site maintenance requirements and is able to undertake the required work themselves. It is useful to provide the landowner with an overall maintenance schedule if they are to undertake the work themselves and it may be that you can offer to look over the site and advise accordingly once a year. Remember we are trying to build long-term relations with the clients so this may be a useful way for maintaining the relationship and furthering other opportunities.

Ultimately, under any FGS and or Carbon contract, the liability lies with the landowner so if they chose not to do the maintenance and the scheme breaches its conditions, they are liable for any penalties or reinstatement. Regardless, it is essential for the project manager to make the landowner aware and outline maintenance responsibilities and liabilities in the development stage and ideally agree a maintenance plan to be implemented.

Maintenance considerations

Once planted, trees should be kept free of weed competition for 1-5 years after planting to aid in establishment. This can be achieved by spot spraying a contact herbicide around the base of the tree (approx. 1 m circle) once in late spring and again if required in late summer.

Ideally, we would not use any chemical but the potential increase of establishment failure if you do not needs to be considered, especially if you have FGS and or carbon funds attached to the site's success. Good ground preparation (such as inverted mounding) can significantly reduce the need for chemical use. You may also be minded to accept a higher beat-up rate against the savings on spraying and reduction of chemical. On large sites the reality is that you will need to inspect the site at least twice a year and make considered decisions about maintenance with the aim to reduce chemical usage to the absolute minimum.

There are other options to control ground vegetation such as mulch matting, but generally this will only be suitable for small sites.

NB: Cutting vegetation around the trees by hand or mechanical means, e.g., strimming, is not advisable because of the risk of physical damage to the tree and because cutting actually increases the vigour of the vegetative growth.

Tubes, spirals, wraps

If using tubes, spirals or wraps then these will need checked and, where necessary, re-straightened and stakes/canes refirmed. It may be that tubes especially need to be hand weeded as the ideal growing conditions they provide can encourage grass to grow vigorously and swamp/shade out the tree inside.

Once the trees are established well enough, that could be between 5-12 years after planting, ideally tubes should be removed and recycled appropriately if they are not fully biodegradable. This is something that needs to be considered by the landowner and finances identified within the overall scheme budget.

Fence checks

All fences and gates should be checked at least once a year and any damage repaired immediately to prevent incursion from animals. It is important to check for deer incursion, and to have a way to remove deer quickly. Driving deer out through a gate is rarely effective, so culling may be required.

Beating up

Beating up is a term used to describe the replacement of failed trees in the years following planting. An annual assessment in the summer, possibly undertaken alongside other maintenance activities, will provide the information needed to ensure the correct trees to be ordered to maintain densities and species mix. Beating up should normally only be required during years 1-3 of establishment with an aim to have 95%+ establishment rates. It is advisable to order the required trees for beat up as soon as possible, or ensure your contractor has if the site is under a maintenance contract, to avoid issues with tree shortages later in the year.

Regular fence checks are required to identify such as this breach caused by badgers

Finances: Making them Work

The FGS grant rates are based on covering around 80-85% of actual costs of establishing a woodland. However, the grant rates are generally fixed for a period of time (usually 5-7 years) and take no account of the inevitable rise of materials and labour. For instance, during the 2022/23 planting season, fencing costs had risen approximately 50% from the previous year however the FGS rates remained the same. Therefore, in reality, they covered only 55-65% of the actual capital costs incurred for this aspect.

In addition, riparian woodlands do tend to be long and thin and have a high fence to area ratio, so the cost per hectare is high comparatively to commercial conifer schemes or where native schemes can be implemented at much large scale. As such, a shortfall in the finances is to be expected. This shortfall will need to be covered by the landowner or, if your model is to deliver the scheme at a cash neutral position to them, by other funds blended to 'top up' the overall cost of the operations.

Basic Payment Scheme (BPS)

Landowners in Scotland receive agricultural subsidies on eligible land under the Basic Payments Scheme (BPS) and land being considered for planting will often be in receipt of these payments with landowners keen to retain them. In general, they will be able to retain their BPS payments for the entirety of the FGS scheme (currently 20 years) providing the woodland creation is delivered via a FGS and that the land meets the eligibility criteria for woodland creation under BPS.

⇆ BPS Eligibility

Providing their terms and conditions allow, additional funds can be sourced and secured and used to 'top up' the FGS and the land remain eligible for BPS. However, should the woodland creation scheme be delivered out with any FGS, then this eligibility for BPS may need to be forgone. A point for consideration by the landowner when various funding options are being looked at. In some cases, the BPS payments may not be a material consideration to the landowner and therefore less relevant.

FGS Payments and cashflow

The FGS grant is arranged through the Scottish Government Rural Payments and Inspections Directorate (SGRPID) and payments for works need to go through the farm accounts and if the farmer is registered for VAT, they should be eligible to reclaim it. The farmer is therefore in control of the FGS funds and payments to contractors.

Due to the SGRPID payment process, there can be several months delay in funds being received and this needs to be explained to the farmer, who may have to pay up-front for fencing etc, and ensure the cash flow is achievable.

If the cashflow is a significant issue, then some of the bigger forestry management companies offer financial packages to cashflow the project. They will of course charge a fee and or interest rate for this, but it may well be the cheapest and simplest way to facilitate the project.

The FGS grant is claimed using FGS standard costs capital grant claim form. Use the Schedule of Works to guide the claim, but be careful not to overclaim, and you need to explain if there is an underclaim.

Inevitably there are times when changes will be required during site delivery that give to the actual capital operation quantities being different from those originally specified. Therefore ensure that contractors give you confirmed details about how much fencing, gates, areas planted etc have actually be delivered on the ground and then go to site and check these yourself before site sign off and submitting your FGS claim. There are limits as to the changes that can occur before more formal variations need be agreed with the woodland officer. As such, it is advisable to liaise with the woodland officer over any changes prior to submission of the grant claim.

Finally, there are signage rules for FGS sites, and these rules are changing post-Brexit, so check the FGS website under 'Publicity'. Where signs are required, you must remember to install them as per the specifications otherwise this may hold up your claim.

Other/Secondary funding options

With identified shortfalls within the FGS additional funds to 'top up' schemes will be required. Some funding opportunities may be more national such as the National Lottery Heritage Fund (NLHF) or Nature Restoration Fund (NRF) and others will be more regional, such as landfill tax or windfarm environmental funds. It pays to be aware of the applicable funds within your area and carry out some initial investigations to see what may or may not be eligible as it is not always obvious and as funds are identified, check the terms and conditions that come with them such as:

- What is the timescale for applications (these can often be very time constrained) and responses and delivery thereof if successful, as sometime these will not align with your project and operation timings. In these cases, it may be that these funding options are deemed unsuitable, or you may need to restructure the project to enable them to be utilised.
- Can the monies applied for be used to 'top up/blend' other funds? (More recently NRF have restricted funding any woodland creation that is FGS applicable.)
- What are the funding limit application amounts?
- What recognition is required?

Many large environmental non-governmental organization (ENGOs) may consider partnership working and look to work with localised partners to deliver compatible outcomes via the offer of specialist advice or resource, providing funds and or help with project development.

Carbon and the Woodland Carbon Code (WCC)

Natural capital and green financing are currently at the fore of much government discussions however the only real tradable commodity currently is Carbon and carbon credits can be sold and utilised under the Woodland Carbon Code.

Woodland Carbon Code

The simplest way to enable carbon units is via the engagement of a carbon broker who may offer options such as selling all the carbon upfront, selling a quota and retaining a quota or retaining it all. The decision for the most applicable option may be driven by many outside factors including the cash flow of the project but what should be remembered is that there are ongoing costs associated with carbon contracts so these need to be considered alongside any cash flow analysis. A reputable broker should be able to set this out for the client in a simple to understand way.

Developing working relationships with the brokers is useful and they may offer introductory, referral and or profit share payments that you may or may not wish to consider. However, any relationships with brokers should always be made clear to your client as your end goal is to be known as a trusted intermediatory as this will aid in delivering much more beneficial works overtime.

Historically, the carbon market has been vibrant and prices paid per tonne have increased significantly; however, more recently farmers have become more carbon aware with many looking to retain their carbon in anticipation of new regulations requiring them to farm in a carbon neutral or carbon positive way. This hesitancy to sell may have any effect on project cashflow if they wish to retain all carbon monies. Therefore, understanding the WCC and how it fits into your overall project early on can aid in giving the client realistic options/expectations if the overriding factor is to deliver the capital works at a cash neutral position.

Similar to FGS projects, any scheme with a carbon contract will need to be 'validated' initially and then 'verified' via regularly inspections to ensure the trees are establishing and the carbon agreement is being met. There are costs associated with validation and verification and these should be clearly identified to the client from the broker to allow full consideration of the proposed agreement.

Putting it together: a basic scheme and finance example

The FGS grant rates are based on covering around 80-85% of the actual costs of establishing a woodland. To aid with identifying financial shortfall it helps to have a functional budget sheet to allow you to draw up and summarise a budget for an FGS scheme swiftly. It is useful to use a spreadsheet for this function as it allows ease of re-budgeting as schemes get refined and capital volumes change.

Example Woodland

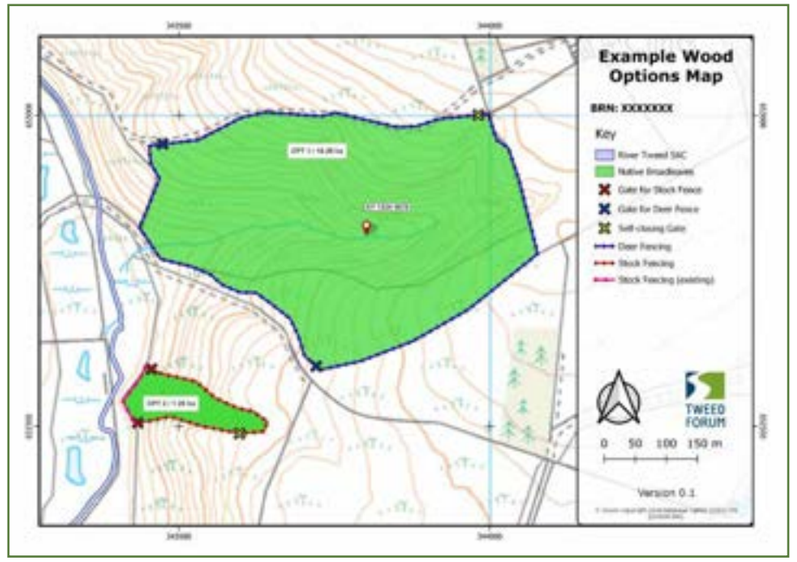
The following is a simplified example of a potential riparian woodland site broken down into its very basic components to give a flavour of what a scheme may look like drawn together for consideration and submission for FGS along with an accompanying budget

In this instance, there is a working history with the farmer and schemes have already been implemented along the Tweed SAC tributary. Having built the reputation with the landowner they have now identified 2 areas that have burns running into the adjoining tributary that are problematic in terms of their stock management. The farmer has asked if these can be put over to woodland to reduce poaching by livestock and issues with stock management.

Options Map

Following some initial desk top work, discussions with the farmer, a site walkover and further discussions with the farmer to refine the options the following basic FGS Options map was produced:

FGS Options Map



The options map gives the very basic key information that would be required for an FGS application and shows the 'options' available and to be applied for under the capital grant.

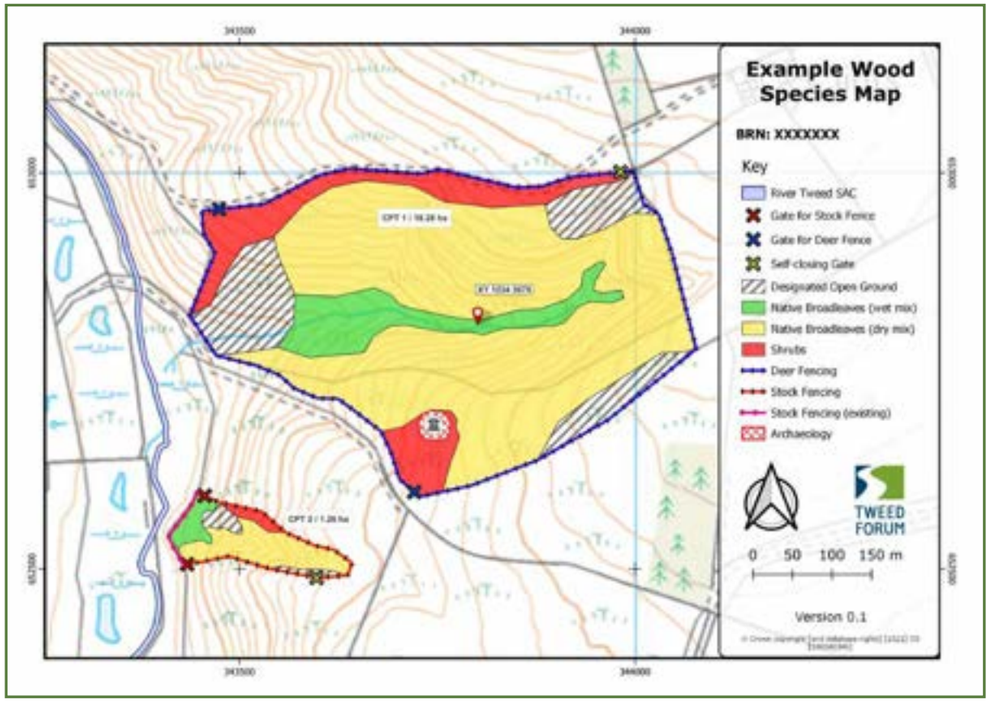
Note the following:

- fence locations have been placed to retain track access for the farmer.
- Gate locations (management and pedestrian) have been agreed with the farmer.
- Cpt 2 utilises some existing stock fencing on its western boundary.
- Areas have been maximised to increase the beneficial impact on the water courses and aid in making the scheme stack up financially.

Operations/species map

Following on from the Options Map and considering the walk over information, a basic planting map can be produced. This shows the main areas for consideration from an operational perspective and for discussion with the woodland officer.

Example Wood Species Map



Note from the above:

- There is an area of archaeology that has been identified and a suitable buffer implemented.
- Ground investigations have identified areas more suited for species tolerant of damp/wet conditions akin to NVC W6 or W7 and more free draining areas suited to a mix akin to NVC W10/W11.

- The large shrub area on cpt 1 has been designed to enable views onto the adjoining land allowing the farmer to enable stock checking (this would be a compromise over the 'ideal' design and need to be discussed with the woodland officer).
- The open ground areas have largely been chosen due to the ground being less suitable for planting in these areas.
- Given cpt 1 is 18.28 ha, this would allow enough room to vary the onsite planting densities allowing a lower density within the riparian zone to enable a more 'ideal' planting scheme in this area. Note this would be more difficult to achieve on cpt 2 given its restrictive overall area.

Budget

The key is to lay out all the costs, which is one of the most significant factors for any landowner contemplating works, in an easy-to-follow transparent fashion.

The example budget sheet utilised below shows very simply, the income and expenditure for the example site over a 5 year period (to allow for the maintenance expenditure and capital payments to be accounted) with a cash flow summary at the bottom. The example shows the potential if the carbon units were also accounted for based on averages per hectare. In this scenario we are suggesting selling the majority of the carbon units upfront.

Note how the income line headings and respective values are just a mirror of what is available via the FGS and then there is also space to allow for any other finances, being blended to top up the capital income, to be displayed and integrated into the overall budget. In this scenario £1750 was accessed from an environment fund, local to the area.

Maintenance costs

Beat up is based on a 10% beat up rate that reduces on a sliding scale over the 5 years as the woodland establishes.

Spraying costs are based on a 100% requirement in year 1 reducing over the next 3 years as the trees establish.

The maintenance costs show the client that there may be maintenance to be carried out and it's worth remembering that if the scheme fails, then it will be their responsibility to pay back all grant plus interest! It is important to mention this at an early stage in your discussions. Often this means designing the scheme with 'belt and braces' and maybe avoiding difficult sites if the landowner is unlikely to look after the site.

Fees

Charging a fee for your services is a useful way to cover officer time and bring funds back into your organisation. However, depending on circumstances, it may be that fees are deemed not applicable and or can be covered elsewhere, i.e., via full cost recovery as part of a wider umbrella project, that may aid with making the scheme more financially attainable.

In this example, fees are based on a sliding scale of total project costs e.g.:

- **Project cost < £10K = 10% fee**
- **Project cost £10-£99k = 7.5% fee**
- **Project cost >100K = 5% fee**

Example Budget

Example woodland (Cpt 1&2)

Income	Quantity		Price/unit	Cap wks	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total inc.
Native Broadleaves	19.52		1,840.00	35,916.80						35,916.80
Stock fence	451		4.40	1,984.40						1,984.40
Deer Fence	1730		7.60	13,148.00						13,148.00
Rabbit proofing existing or new stock or deer fence	1730		1.60	2,768.00						2,768.00
Tree shelter: above 1.2m	1200		2.00	2,400.00						2,400.00
Tree shelter: 0.6 - 1.1m	514		1.16	596.24						596.24
Vole Guard	24860		0.19	4,723.40						4,723.40
Gate for Stock fence	2		136.00	272.00						272.00
Gate for deer fence	2		172.00	344.00						344.00
Self closing gate for non-vehicular access	2		280.00	560.00						560.00
Annual maintenance Native Broadleaves**	19.52		272.00		5,309.44	5,309.44	5,309.44	5,309.44	5,309.44	26,547.20
Local / Regional environment fund	1		1,750.00	1,750.00						1,750.00
Total Income				64,462.84	5,309.44	5,309.44	5,309.44	5,309.44	5,309.44	91,010.04

* Claimable when planting complete. May take 2-6 months from claim to payment

** Payments claimed a year in arrears

Expenditure	Quantity		Price/unit	Cap wks	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Total cost
Pre planting surveys (habitat, archaeology etc)	1		750.00	750.00						750.00
Cultivation - mounding	26,574		0.40	10629.60						10,629.60
Supply & Plant 20/40 cg tree and install 1.2m shelter & stake	1,200		4.95	5940.00						5,940.00
Supply & Plant 20/40 cg tree and install 0.6m shelter & stake	514		3.85	1978.90						1,978.90
Supply & Plant 20/40 cg tree and install vole guard & cane	24860		1.22	30329.20						30,329.20
Supply and install Deer fencing with rabbit netting (FGS compliant - stnd spec)	1,730		18.50	32005.00						32,005.00
Supply and install Stock fencing (FGS Compliant - stnd spec)	451		8.50	3833.50						3,833.50
Management gate in stock fence	2		250.00	500.00						500.00
Management gate in deer fence	2		440.00	880.00						880.00
Self closing gate for non-vehicular access	2		225.00	450.00						450.00
Beat up @10% (Proportionately decreasing after yr 2)	26,574		1.30		3,454.62	2,763.70	2,072.77	1,381.85	690.92	10,363.86
Weeding/tree (Proportionately decreasing after yr 2)	26,574		0.15		3,986.10	3,986.10	2,790.27	1,594.44	797.22	13,154.13
Total Operational Costs				87,296.20	7,440.72	6,749.80	4,863.04	2,976.29	1,488.14	110,814.19
Facilitator Fee	1.00		6,110.73	6,110.73						6,110.73
Carbon Income										
Carbon Sold (net hectares)	**19.52**		2,750.00	26,840.00	13,420.00			13,420.00		53,680.00
Net cost/return				-2,104.09	11,288.72	-1,440.36	446.40	15,753.15	3,821.30	
Accumulating balance					9,184.63	7,744.27	8,190.67	23,943.82	27,765.12	27,765.12

Yr5/6 Final Net cost/Return	**27,765.12**

Example costs

In this example, at the end of year 5, this site could potentially give a £27K return to the landowner. This is not without risk and this needs to be considered by the landowner and it may be that they cover the delivery shortfall themselves and retain the carbon for future use by their own business or on the anticipation of increased carbon prices in the future and selling at a higher price.

If all the above was attractive to the landowner, there were no major restrictions and the woodland officer was in general agreement then you could start your FGS application, tidy up the maps and start to source funding options.

Engaging Contractors

This section does not cover contract framework/development however there are various contract frameworks available that are suitable for woodland creation projects, but it is advisable to ensure these are fit for purpose both practically and legally before use.

There are some generic considerations when engaging contractors to deliver woodland creation projects that can be broken down into the simplest aspects; planning and development of the FGS (if not doing this in-house), fencing, ground preparation (if required), supply and planting of trees and installation of respective protective measures and maintenance.

Tender documentation should contain all the information in the FGS contract; operations plan, compartment species breakdown, maps, fencing specs (all compliant with FGS requirements), required work timings, health and safety requirements, hazard maps for under or over ground utilities or other restrictions etc. This is crucial to enable accurate pricing and works planning that will reduce the possibilities for increased costs being encountered once the project is underway.

There are two basic options regards contractors:

- **Forest management companies ('One Stop Shops')**

These tend to be the bigger more established firms who can deliver the whole contract, generally, via the engagement of sub-contractors to deliver the various aspects of the work required. You will however only have one contracts manager to deal with, which is a significant plus and makes for swift and concise communications both through the tendering process and subsequent delivery phases.

- **Individual contractors ('Piecemeal contract delivery')**

This is the engagement of various contractors that will deliver individual aspects of the overall requirement. i.e., a fencer for the fencing, a ground works company for ground preparation and a planting contractor for planting and maintenance.

Through any tendering process you will likely need to meet prospective companies on site to allow them to accurately price the required works and on the basis that generally a minimum of 3 tenders are required to satisfy the funding terms and conditions, a minimum of 5 contractors will need to be approached.

On that basis if approaching forest management companies, you will need to issue 5 sets of contract documentation and will likely need to attend 5 site meetings prior to tenders being submitted. In contrast, if approaching individual contractors this may require 5 tenders for each aspect of the works (fencing, ground preparation, planting & maintenance), then you will potentially be looking at 15 sets of contract documentation requiring development, and issuing and meeting 15 individual contractors. This is before all the follow up work post tender submission and then managing 3 sets of contractors through respective delivery phases compared to just dealing with 1 contracts manager via a forest management company.

Forest management companies will, generally, be more expensive than the total cost of individual contractors as they will add on their own management fees; either as a standalone cost or split over the whole project costs. However, in real terms, this route may be cheaper given the lesser amount of officer time required and be more efficient as you deal only with the forest management companies contracts manager. So, it is always wise to consider project delivery costs holistically, as opposed to concentrating purely on the submitted contract figures. This is especially true if running multiple sites where officer management and administration time will be at a premium.

Conversely, for smaller sites or where a landowner may require you to use 'their' contractor for certain practical aspects, (this is often the case when it comes to fencing) it may be simpler, and cheaper, to use individual contractors. Again having the holistic view of the whole contract is required to enable the best delivery process.

A level of scrutiny is always needed when employing contractors and a good reputation is always a strong plus and with new contractors you may wish to see some of their work prior to engagement. Regardless, any site with a new contractor should be closely monitored to ensure works are to the correct standard as required by the FGS.

A pre site meeting with the successful contractor/s is an absolute must to ensure they understand the site, storage and access arrangements, fencing locations, planting areas and to ensure that health and safety measures are being implemented and adhered too.

This should be followed up with regular site monitoring as works progress to ensure everything is being delivered correctly and progress is on time. This is especially important for those that are inexperienced as it will build confidence and learning of practical issues that in turn will aid future site walkover considerations, contract development and overall project management.

Building relations with reputable contractors is essential and can pay dividends in the long term. Reputable contractors will overcome problems and go the extra mile to deliver a site and also, as professional trust builds, reduce site monitoring requirements.

FGS applications

It may be determined that officer time is better spent managing others to deliver the whole or part of the FGS application process and forest management companies and many individual woodland agents will offer this service. One point to bear in mind if utilising contractors in this manner, is to ensure the focus remains on a clear end goal of improved riparian habitat and ecological connectivity and this is not sacrificed in preference for either financial savings and or gain.

Conclusion

There is now an overwhelming case for restoring native riparian tree cover and in Scotland, there is financial support for woodland planting through the Forestry Grant Scheme administered by Scottish Forestry and Rural Payments and Inspections Directorate. There is also support for water margin protection through the RPID Agri-Environment Climate Scheme (AECS).

But, the creation of targeted riverside woodland at scale is not straightforward because the grant system, whilst effective for more commercial forestry, does not readily support riverside schemes. Looking towards 2026 and beyond, there is a review of the current FGS and this, combined with the dawning of natural capital finance, should ensure river woodland delivery is a more attractive and easier prospect in the future.

However, the contents of this document explains that with the right planning, correct design - preferably at scale, and ensuring we get the right trees in the right place for the right reasons it is possible to deliver these much-needed improvements right now.

Good luck – take your time, use the information and the links provided within this document and be proud of the results of your efforts!

'The best time to plant a tree was 20 years ago, the second-best time is now!'

Further References

Designing and managing forests and woodland for flood risk.

https://www.forestresearch.gov.uk/publications/designing-and-managing-forests-and-woodlands-to-reduce-flood-risk/

WT woodland creation guide

https://www.woodlandtrust.org.uk/plant-trees/woodland-creation-guide/

(This is a very large document and delves deeply into all aspects of native woodland creation it is a very useful reference document)

Riverwoods Evidence Review

https://www.riverwoods.org.uk/resource/riverwoods-evidence-review/

Managing-Deer-for-climate-communities-and-conservation

https://www.scotlink.org/wp-content/uploads/2020/01/Managing-Deer-for-climate-communities-and-conservation-2.pdf

Adapting forest and woodland management to the changing climate.

https://www.forestresearch.gov.uk/research/climate-change-adaptation/adapting-forest-and-woodland-management-to-the-changing-climate/

Designing and managing forests and woodlands to reduce flood risk

https://www.forestresearch.gov.uk/publications/designing-and-managing-forests-and-woodlands-to-reduce-flood-risk/

UKFS Practice Guide 25 Managing forest operations to protect the water environment.

https://www.forestresearch.gov.uk/publications/managing-forest-operations-to-protect-the-water-environment/

Thanks must be given to Hugh Chalmers for the initial paper this document is based upon.

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AT THE HEART OF LAND & WATER MANAGEMENT ON TWEED