Farming with Nature Working Group

Farming 1.5 Inquiry – A positive pathway to Net Zero 2045

A Holistic Approach: Food, Nature, Carbon Sequestration and Rural Communities.

Delivering Nature and Carbon Sequestration within the 2045 farming landscape are fundamental components of the Farming for 1.5 model of low GHG production; components which have the potential to contribute to national goals. The synergies between biodiversity and sequestration create a range of land-use opportunities which can reduce the climate cost of production.

The Report of the Farming for 1.5°C Inquiry maps out a positive pathway to Net Zero. The report not only identifies key interventions and milestones but details baseline work, audit standards and advisory systems to support culture change, foster low carbon innovation and to facilitate measurable change.

A succession of interventions, soil carbon management, a menu of mitigation measures, and GHG reduction contracts for carbon dioxide, nitrous oxide and methane are built on a choice of two farming models to move the sector to low carbon production but also secure biodiversity and develop sequestration across the landscape.

It is clear that although technical development and precision techniques may reduce the climate impact of inorganic fertilisers, and that the emissions of grazing livestock can be reduced through a range of interventions, both nitrous oxide and methane emissions will remain a significant challenge for farming’s journey to Net Zero. The development and management of land parcels to sequester or store carbon will therefore be a crucial component of low carbon production for the foreseeable future.

At the core of the Farming for 1.5°C Report is a holistic approach which integrates climate change, biodiversity and food production goals into future farming systems. That approach recognises society’s priorities but importantly builds on the traditional mosaic of land use and management across the agricultural landscape and exploits the synergy between low carbon production, sequestration and biodiversity. A holistic policy can ease implementation at farm level and optimise sustainable outcomes avoiding the conflicts and burden of three separate policy drivers.

Three different biodiversity categories to describe how nature reaches into farming have been identified:

1] PERMANENT LANDSCAPE FEATURES- e.g. farm woodlands, tree lines, hedges, shelter belts, ponds. These features are often not directly linked into production activity but indirectly may add value in agronomic terms through creating a reservoir for biodiversity, safeguarding water quality, providing shelter, and improving biosecurity. For society they are often valued landscape and biodiversity features that sequester and/or store carbon. Perversely they have often been ignored by official agricultural mapping with many features historically regarded as ineligible land by EU audit systems. However in the new CAP Strategic Plans, many countries will be including landscape features as core to meeting the CAP’s wider objectives.

2] DEFINED AREAS- Land under agri-environment and/or regenerative management[[1]](#footnote-1) e.g. field margins, water margins, break and cover crops. These may be ongoing management systems over fixed areas that support biodiversity and connectivity or may be periodic interventions that provide a mix of habitat including supporting pollinators and invertebrates before the land reverts to production. Agri-environment schemes have been incentivised and mapped as a component of support systems. Regenerative interventions that build soil carbon and nutrient levels are an important pillar of carbon-building production that support biodiversity. But as part of a rotation, are likely to have only a cyclical impact on carbon storage.

3] SEMI-NATURAL HABITATS- Production focused farming systems which integrate semi-natural habitats or species rich land parcels into grazing systems, e.g.

a] low intensity or episodic grazing based on semi-natural habitats such as wild flower meadows, acid grasslands, peatland, heathland, wetland, open scrub, or created habitats including agro-forestry or

b] areas that may support periodic grazing or cropping including timber outputs.

These, often traditional, farming systems safeguard significant areas of habitat, the value of which, depends on appropriate management. If maintained in good condition, these areas can provide species rich habitats, carbon storage and/or sequestration and ongoing agricultural production. These areas may also in some cases deliver other societal and environmental benefits such as supporting water quality, flood prevention, sustainable water flows, and timber production. Farmed semi-natural habitats in some catchments that connect across holdings may have the critical mass to be of regional value. Habitat areas on farm are biodiversity assets, which today are often not well defined or mapped, but have the potential to be brought into recognised management as the core of the *Farming with Nature* systems outlined in the frameworks outlined below. Farm habitats provide an additional option to woodland expansion as a sequestration land use; one which can maintain diverse economic activity in rural communities, protect landscapes and build biodiversity.

Current mapping standards mean that neither land-managers nor the competent authority have a complete record or understanding of the identity or range of biodiversity features on particular holdings, their location or area.

The Farming for 1.5°C Report recognises the diverse range of biodiversity features across the agricultural area and their importance at both farm and national level to not only deliver for nature but also provide carbon storage and sequestration. However, to manage the resources on crofts and farms baseline holding surveys and mapping are required.

Building on a baseline whole farm survey, the report outlines two low Carbon production models that exploit the mosaic of biodiversity across the farmed landscape to build sequestration and carbon storage into the 2045 agricultural area without abandoning the focus on food production.

These two options are (further detail about the standards and pilots is provided at the end of the document):

* **Farming with Nature 10** – A BASIC STANDARD APPLICABLE TO ALL HOLDINGS- requires the farmer to
	+ 1] monitor and maintain soil carbon within optimal ranges for soil type/land use [enclosed land] and
	+ 2] to provide space for nature – 10% of holding area [all three categories of biodiversity eligible]. This would fit within the Scottish Government’s suggested Tier 1.
* **Farming with Nature 30** [previously termed Nature Value Production] A SIGNIFICANT COMMITMENT TO NATURE AND SEQUESTRATION /AN OPTION THAT WOULD ATTRACT ADDITIONAL FUNDING– requires the farmer to
	+ 1] monitor and maintain soil carbon within the optimal range for soil type/land use [enclosed land] and
	+ 2] to manage 30% of the holding area for biodiversity and
	+ 3] 30% of holding area for carbon storage/sequestration.

The same land area may qualify for both biodiversity and sequestration. All three categories of biodiversity are eligible to contribute to the 30% target but it is envisaged that habitat based production systems [including agro-forestry] will be a significant component of the biodiversity and carbon storage area. This would fit within the Scottish Government’s suggested Tier 2. The *Farming with Nature 30* (FWN 30)programme, by bringing mapped biodiverse areas [including semi-natural habitats] into condition monitoring and safeguarding through biodiversity management agreements, can contribute to the UK’s COP15 30 by 30 obligation.

Obligations to deliver biodiversity and carbon storage/ sequestration under both the *Farming with Nature 10* (FWN 10) and FWN 30 may include land features that are classed as ineligible under EU standards. Bringing ineligible land into the agricultural area land use mix and supporting the management and development of farm systems based on a diverse range of habitats, including agro-forestry, are key components of both the projected farming models.

The *Farming with Nature 30* option creates a new land management mix and income stream which has the potential to safeguard the future of farming and communities across the LFAs and other areas of specific biodiversity importance, while building a sequestration asset to balance activity across the whole of Scottish agriculture. A high uptake of a million hectares committed to Farming for Nature 30 would deliver around 300,000 hectares of biodiversity and 300,000 hectares carbon storage/sequestration.

# Working Group Challenge

## Background

Identifying and mapping sequestration and biodiversity features on farm provide data which are fundamental components of a holding’s carbon, GHG and biodiversity audit. A national sequestration and biodiversity survey across the farmed landscape delivers an important component of both the nation’s carbon and biodiversity inventories and is key to the delivery of the climate change and biodiversity obligations defined by the COP processes.

## The Challenge

Identify a robust standard farm survey process to identify, classify, condition score and map habitats and biodiversity features, Including woodland and agroforestry, as a component of a whole farm plan.

This is to underpin-

1] Farm Support - Identify features which can contribute to FWN 10 and FWN 30 obligations.

2] Appropriate management approaches on farm.

3] Appropriate management at catchment level –connectivity.

4] Carbon and biodiversity audits at holding level.

5] The evidence base for the sector’s contributions to sequestration and biodiversity at a national level.

6] The green and climate credentials of Scottish food and drink.

# DELIVERY RECOMMENDATIONS

## BASELINE ACTIONS

### Soil Health - Carbon

Monitoring and maintaining soil carbon within the optimal range for soil type and land use is a fundamental aim of sustainable production systems. Soil health optimises water retention, water drainage, nutrient delivery, and is the core of biodiversity.

Active Soil Carbon management will be focused on enclosed land which is cropped or grassland subject to regular reseeding.

The Farming for 1.5°C Report details monitoring and an on-going national survey of soil carbon [5 year rotation] supported by expert advice. That expert advice is an important resource to nudge proactive soil management and also a safety net for managers when soil carbon dips.

The initial testing phase introduced by the Scottish Government should be developed into an on-going survey underpinned by expert soil advisory support.

It is envisaged that field soil carbon values are built into whole farm mapping to provide a complete holding profile while the carbon values can also be factored in to the holding carbon audit.

### Biodiversity – Identification, classification and mapping

Mapping at holding level is the basis for future management, defining the characteristics, baseline condition, location and size of natural assets. Those features and their value will feed into both holding level and national inventories and will indicate [through matching habitat profiles with the carbon values defined in the national inventory] carbon storage and sequestration across the farmed landscape. The data will underpin the environmental and climate credentials of Scottish food.

That mapping process through a Whole Farm Plan, very much like the soil carbon audit, is a foundation of future farming. Professional Environmental Consultants should manage the survey work and validate both the definition of features and their condition captured by the mapping work. The survey should be a partnership between the consultant and land manager and where possible build a relationship which develops into advisory support. The planning and development of ESA schemes founded on the partnership between advisors and farmers is a positive model which can inform this new challenge.

National environmental and biodiversity mapping is sometimes incomplete, at holding level there is no coordination of data, and sources are not always easily accessible. It would be helpful if material was integrated where possible and open source.

The baseline mapping of holdings to underpin both the FWN 10 and FWN 30 programmes can help to address the national deficit in detailed biodiversity intelligence.

## Cairngorms Pilot and Borders Pilot

At farm level, survey work in the Cairngorm National Park and pilot work carried out in the Scottish Borders provide important evidence that can optimise the delivery of a national programme touching all holdings.

### DELIVERY INDICATORS

* The definition and number of recognised habitats can influence the audit journey
* The use of smart phone apps can ease the mapping process but can still require time to translate the data onto a standard mapping model.
* The partnership between consultant and land-manager explored in the Scottish Borders was demonstrated to add value to outcomes and in some cases speed up the survey.
* Reviewing both pilots Moira Gallagher and Alison McKnight believe that complex habitat classification did add value but also added time and cost to the initial holding audit. Focusing on core habitat types is more likely to deliver positive outcomes and support cost effective audit and mapping.
* The on farm/croft holding audit /mapping process should be supported by the Scottish Government Holding IACS Maps with Aerial Photography made available to the Environmental Advisor prior to the survey, along with available Habitat Maps of Scotland, and designated site data.
* The biodiversity audit and mapping will provide the immediate baseline for FWN10 and FWN 30 and should be integrated into the IACS Map system. In the interim, upgrading the Holding maps held by RPID would be of value through the development of systems to capture hedging and other ineligible features.
* A layered approach should be adopted to upgrade the present Holding IACS Maps –
1. Identify all land parcels where woodland, scrub are dominant, designating woodland type, identify hedge lines, water bodies and wetland.
	1. Identify land parcels where rough grazing predominates.
2. Indicate SSSI, SAC, and LFAS Status including the grazing category
3. Display field soil carbon status
4. Capture the habitat mapping from FWN 10 and FWN 30 from the whole farm plans.

A layered approach would mean that a range of recognised professionals would transfer their mapping or data onto the RPID mapping system

### POTENTIAL OPPORTUNITIES

Biodiversity mapping is at present based on a whole farm plan, which is a proven approach – and a single standard looks important. However, other systems are being adopted which might be reviewed and piloted if they appear to add value or ease the audit process Government perhaps should explore the value of other audit models on the basis that they may add value or ease delivery; however it is likely they would have to be adapted or simplified to focus on carbon and biodiversity.

Examples discussed include:

* The restoration wheel system adds in a useful monitoring element that is fairly simple to replicate. The LEAF audit is known but comprehensive across 9 farm issues and is therefore a deeper audit than is required:
* The Society for Environmental Restoration plan to bring forward an ‘International Standard developed in Australia, Light versions may also be an option.
* Nature Scot is scheduled to produce a new list of recognised habitats in 2023. Adopting this standard can provide a baseline for future farm audits which would align with other environmental activity. It is envisaged that the Nature Scot standards will develop existing work, avoid unnecessary complexity and be workable at field level. However, the Nature Scot Habitat list should be subject to independent review before it is adopted at industry level. Further, prioritisation of habitats is not seen to be useful i.e. all habitats on the Nature Scot list should be of equal weighting.

### CONDITION ASSESSMENT

Condition assessment is key to all audit types as it will determine the management requirements of mapped features and / or land parcels with biodiversity value. They should be clear and simple and framed in a positive way to encourage buy-in from the land manager. For example:

* OPTIMAL: Continue existing management
* GOOD: Define management goal to reach optimal standard supported by a development plan.
* RESTORATION WORK REQUIRED: Define management programme to gain GOOD or above designation

PRIORITIES -In a situation where funding levels limit opportunities to enter FWN 30, proposed plans may be prioritised for funding through the inclusion of features which add value:

a] connectivity of habitat areas within or between holdings, plans which contribute other societal benefits

b] natural flood protection,

c] water quality or plans that deliver

d] significant areas which sequester carbon.

Biodiversity Audits should be repeated at 4 to 5 years to upgrade maps and validate the status and condition of areas committed to FWN 10 and FWN 30. Self-Auditing should be explored based on monitoring and management agreement/ partnership with a recognised professional environmental advisor. The nature assurance partnership would be based on ongoing monitoring and advice to maintain management on track.

### CASE STUDY CAIRNGORM NATIONAL PARK –FARM HABITAT SURVEY & ENHANCEMENT

In 2022 the Cairngorms National Park undertook a pilot consisting of farm habitat surveys and developed recommendations for environmental enhancement on 6 farms within the National Park. This used the Phase 1 habitat classification and advisor assessment to produce an Environmental Constraints and Opportunities Plan (ECOPs) for each farm to allow both the farmer and the CNPA assess options for environmental gain. A carbon audit and Integrated Land Management Plan (ILMP) was also produced for each farm. This was a valuable exercise but costly. Both the biodiversity component and the ILMP being costed at over £1000.

Results have yet to be fully evaluated but initial assessment includes:

* working with the farmer is essential;
* farmers are generally supportive of improved environmental performance;
* having a sound knowledge of both farming systems and ecology is vital to correctly classify and condition score habitats;
* a simple, standardised data collection and review process is key to ensuring consistency but this must allow individual merits to be shown;
* baseline information should have a mechanism to account for existing environmental management;
* gathering information from various sources is time-consuming and costly; and
* having support to knit together carbon and biodiversity options is important for many farms.
* The process would be eased by support back-up through the provision of upgraded Holding maps from RPID.

### Process and Costing

### ADVISORY RESOURCE AND TRAINING

The availability of an appropriately trained advisory service where both farming systems and farm ecology is understood is a limiting factor. Resources are required to ensure this does not hold back farm plan development. To ensure a good standard is achieved, it is important that advisors are accredited to a level where both agricultural knowledge and ecological knowledge are proven. Currently CIEEM membership is a common accredited level but FBAS may wish to develop a specific accreditation.

The 1.5 Report outlines the role of CPD in supporting farmers/land managers. Current discussions involving Lantra and Ricardo are exploring the design of carbon and biodiversity CPD training days. Relevant training programmes are currently available from the Soil Association, and through the Scottish Government, Farming for a Better Climate programme. Coordination and focusing further CPD development once biodiversity implementation tools and targets are known looks important.

### Sequestration and carbon storage- mapping and classification of assets

The holding biodiversity and cropping map linked to the field soil carbon status over the enclosed area may be used to indicate both the carbon stored and potential carbon flows of the farmed land parcels, areas of biodiversity, semi natural habitat, and agro-forestry or woodland,. Together that mosaic of field and habitat data linked into the inventory standards for carbon storage, carbon loss or sequestration for each land use quantify the holding carbon storage and the net carbon loss or sequestration.

Values of both the stored carbon and the flow of carbon associated with a range of grassland and crops are available. Similar data is available for a range of habitats and woodland types. However to align with the national inventory the values used at both farm and national audits will have to be defined by the smart inventory, although soil carbon values from routine soil analysis can contribute objective data to inform the holding status across the enclosed area.

The accuracy of the biodiversity audit and mapping is therefore crucial in identifying both the holding’s carbon value and the management priorities for each land parcel.

Upgrading IACS mapping to carry biodiversity features including a range of woodland types and habitats would simplify both carbon and biodiversity audits at holding and national level and also provide an accurate template for both biodiversity and carbon management.

Farming with Nature 10, and Farming with Nature 30 could be based solely on a whole farm biodiversity plan until national mapping standards are upgraded. However upgrading IACS mapping to carry core biodiversity features should be a priority; it would facilitate the uptake of both biodiversity and climate change initiatives, reduce costs and provide a national resource that could inform policy and validate national audit outputs.

 It is therefore likely that during the pilot phase of FWN 10 and FWN 30 individual whole farm assessments will be the only baseline available for the programme.

Upgrading IACS holding maps would have to be prioritised if a wider rollout is adopted.

## FARMING WITH NATURE STANDARDS

### Farming with Nature 10

TIER 1

The core of this standard includes:

* Survey and map the holding to define and quantify biodiversity features and habitats. [Whole farm Plan] Score condition of features and habitats. Ideally focus survey work on the Apr to June period, or Apr to Sep with additional bird nesting information.
* Monitor and manage soil carbon at field level to maintain values within recommended level for soil type and production system [enclosed land]. This soil management needs to be supported by specialist advice.
* 10% Nature obligation – 10% of holding area, three Nature Categories; biodiversity features, agri-environment /regenerative practices [eligible list], and habitat scale biodiversity area may all contribute to the 10% target. [maintain features in good condition, restore features in sub-optimal condition][[2]](#footnote-2) The FWN 10 PLAN is based on a whole farm plan.
* Land ineligible under EU Rules may contribute and qualify as a component of the 10% nature obligation.
* The obligation to deliver the FWN 10 MANAGEMENT STANDARDS lies with the holding manager in most cases the farmer or crofter however in short term tenancy agreements including contract farming and grazing lets the obligation lies with the land owner.
* Support available for woodland/ agro-forestry creation but not for ongoing management of other features.

#### Implementation

As a core component of basic support, focused on nature, all holdings would be involved and on cropping units Farming with Nature 10 would replace EFA obligations.

With no extra support linked to the FWN 10 nature obligations, it is important to avoid a significant planning and implementation cost. There must be a simple gateway. The design of any on-farm scheme should be heavily influenced by the features identified by the biodiversity audit and mapping. It is important however that the land manager, farmer or crofter should be involved in selecting nature features compatible with the farm landscape, business activity and their own priorities to deliver a 10% nature target aligned with the business production aims.

Smaller holdings [40ha or less] could be subject to a derogation allowing a lower nature space target.

The 10% nature plan once fixed should be built into the basic payment application form and holding map in a format that could be drawn down into a carbon calculator for farm audit.

### Farming with Nature 30 an option for producers-

TWO OPTIONS –1] Low Carbon production – GHG Reduction Contracts -PRODUCTION FOCUS

 2] Farming with Nature 30 – PRODUCTION PLUS NATURE AND SEQUESTRATION

This section only focuses on the FWN 30 Option.

Core standards shared with FWN 10:

FWN 30 Shares the same baseline standards but adds specific obligations to deliver on nature and sequestration [including the maintenance of carbon stores]

* Survey and map holding to define and quantify biodiversity features and habitats. [Whole farm Plan] and score condition. Ideally Survey Apr to June, or Apr to Sep with additional bird nesting information. [As for FWN 10]
* Monitor and manage soil carbon to maintain values within recommended level for soil type and production system [Field level/enclosed land]. Soil management supported by specialist soil advice.
* 30% Nature Obligation- 30% of holding area; Three Nature Categories 1]-Biodiversity features [including ineligible land], 2] Agri-environment / regenerative practices [eligible list], and 3] Habitat scale biodiversity/semi-natural areas- management may all contribute to 30% target. Define and map any commitment to the creation of features to fill any deficit. The FWN plan will be based on a whole farm plan.
* As part of the 30% Nature obligation there should be the Option to create new habitats or area of agro-forestry or woodland.
* 30% Sequestration/carbon Obligation – 30% of holding area; translate biodiversity map into a carbon store/sequestration map on the basis of standards defined by the smart inventory. Where the biodiversity area fails to fill the sequestration obligation there would be a requirement to define and map the creation of sequestration areas to fill any deficit.

Both nature and sequestration features would be eligible on the basis they are in 1] OPTIMAL condition and are managed so as to maintain status. 2] GOOD condition to be managed to ACHIEVE TARGETS which move the area to optimal status. The obligations to be defined in a management plan. 3] Areas which are defined as REQUIRING RESTORATION or CREATION would be supported by a management plan with development milestones to raise the area to Good status.

 Ineligible land can contribute to both the 30% Nature Obligation and the 30% Carbon storage/sequestration Obligation.

Support systems, if available, [TIER 3 or FA] for the creation, restoration and on-going management of specific habitats including agro-forestry and woodland could provide another path to support the 30% obligations.

The obligation to deliver the FWN Management standards lies with the land-manager in most cases, the farmer or crofter; however land subject to short term tenancy agreements including contract farming and grazing lets the obligation must lie with the land owner.

#### Implementation

COULD BE CONSIDERED AS A TIER 2 PROGRAMME- The outputs of public goods will have direct positive local impact and contribute to national carbon and nature obligations while acting as a resource for the sector contributing to national biodiversity and climate targets. The more ambitious target of 30% of the holding area contributing to nature and 30% of the area delivering carbon storage or sequestration adds to the holding management load, is likely to add costs and /or reduce output. The added costs and services delivered should attract an enhanced payment as a Tier 2 option. Support levels of the two tier 2 options- Low Carbon Production FWN 10 and FWN 30 may be weighted to incentivise uptake.

# Farming with Nature 30 PILOT

1. The Farming with Nature 30 programme demands nature and sequestration obligations which are more extensive than the FWN 10 programme and therefore qualifies for enhanced support. FWN 30 should as does FWN 10 qualify production for future green food labelling standards.
2. Suggested Pilot Payment rates on a per hectare basis across the whole holding. £60 per hectare over the first 100 hectare; £30 per hectare from 100 to 500 hectares; £10 per hectare from 500 to 1000 hectares and £1 per hectare thereafter. [Ineligible land with biodiversity value would attract payment]
3. If adopted as component of future farming support- Farming with Nature 30 holdings [FWN 30] would qualify for a TIER 2 payment- An annual income supplement on the basis that holding sequestration assets do not attract commercial payments under a carbon off-setting agreement. A minimum stocking rate should also be achieved. [LFASS GRAZING CATEGORIES –provide stocking rate baseline]]

The annual eco income supplement for FWN 30 reflects:

* the significant land area under nature management,
* the potential reduction in holding output and/or increase in production cost including fixed cost per unit of output
* The management challenges of delivering a diverse range of outputs.
* The imperative of underpinning a sustainable business model that delivers key priorities for society and the farming sector.
1. FWN 30 Holdings should be eligible for Support for agro-forestry or woodland creation through a ring-fenced agro-forestry budget. Any agro-forestry development would be an eligible component of the FWN 30 FARM/CROFT PLAN
2. FWN 30 Holdings should also be eligible for support through targeted habitat development and restoration schemes including peatland restoration which may be available through Tier 3. Such schemes might also be eligible components of the FWN 30 Plan.

 PILOT COSTS

 Years 1-3 Pilot

Using a 300ha FWN 30 holding to model potential pilot cost-

An eco-income supplement of £12000 /per holding using the front-loaded funding model outlined above.

Using the 300ha unit as the average holding profile - £4m pilot funding would support 333 holdings under FWN 30 management with 33,300ha under biodiversity management and 33,300ha providing carbon storage or sequestration.

 The initial audit, mapping and plan development would require a budget of over £333.000.

In addition a budget should provide for administration and a small discretionary fund to support fencing to enable habitat management.

To ensure consistency with the aims of Farming with Nature, a Delivery Board with industry, scientific, ecological and economic representation/expertise should be established to monitor costs and outcomes. Using the evidence built up over the initial pilot phase (years 1 and 2) the group should be tasked with confirming or developing the delivery model to underpin the expansion of the Farming with Nature 30 Area. It is important that those serving on the Delivery board be guided by the goals of the programme and its terms of reference.

 The Board role would involve a review of the first phase of the FWN Programme and if necessary to recommend changes in operating standards and/or the level of the eco- Income supplement available to FWN 30 producers in the event of a FWN Model progressing as a TIER 2 OPTION.

## AGRO-FORESTRY

AGRO-FORESTRY AN IMPORTANT FWN 30 OPTION- An approved plan could include existing and/or newly created Agro-forestry areas to deliver biodiversity and/ or sequestration goals. Establishing agro-forestry which can deliver a range of benefits should be grant aided through a ring-fenced agro-forestry budget. Planting grants should reflect the cost of planting within a farmed landscape. New design options should be introduced to support multi-functional planting design with flexibility on tree density, grazing corridors and support for the wider planting of native trees. –

See Appendix 1 for more details on potential grant scheme

### Agroforestry needs horizontal incorporation

SUPPORT THROUGH A RING-FENCED AGRO-FORESTRY BUDGET

In funding terms Agro-forestry and woodland creation should be a standalone component of farm/croft land-use supported by a dedicated ring-fenced Agro-forestry budget which recognises the costs of establishing trees that fit with agricultural activity and underpinned with appropriate multifunctional planting design options. Agroforestry creation can be plugged into FWN 10 or FWN 30 Plans and contribute to the required targets.

It is envisaged that agro-forestry will be a significant component of on farm land-use. The UK CCC targets for tree planting on agricultural land should be attainable without significant impacts on food production if focused on Macaulay Land Class 5 and 6, planting is designed into the farm system and at appropriate scale. On hill units strategic planting can provide fence lines, biosecurity buffers, infrastructure and shelter with added benefits if agro-forestry design allows grazing. Shelter has been a significant driver for woodland creation or agro-forestry, however more extreme summer temperatures may reinforce that driver and further reach into low-ground grazing holdings.

Native trees and broadleaves, which allow light to penetrate the canopy avoiding the loss of ground cover, are at the core of agro-forestry design where grazing livestock may be introduced after tree establishment. This model also reduces soil carbon loss during the establishment phase and can enhance biodiversity values. There is also a lower risk of biodiversity loss through poor siting decisions compared with conventional woodland as the design inherent in agroforestry maintains significant elements of the original ground flora. The agro-forestry budget should reflect the establishment cost of this type of native planting. It is recognised that any protection approach based on individual tree protection only will have high establishment costs and therefore is only suitable for limited areas, probably on lower ground. At scale (eg on grade 5 and 6 land) , traditional forestry approaches to protection can be adopted with grazing animals re-introduced once trees are established.

The initial agro-forestry budget should target an annual 5000ha planting level rising to 8000ha when the initial target is achieved moving towards a total area of between 100,000 and 150,000 hectares by 2045.

 The basis of a possible grant structure for a range of Agro-forestry models, showing planting density and design criteria is detailed in a paper written by Andrew Barbour and Lucy Sumsion. The paper is attached as an annex.

 In any silvopastoral agroforestry model, species mixes and planting patterns are designed to maintain a significant part of the ground flora and so light canopied species such as birch in a mix with other more shading species are likely to be used. In alley cropping models, a more diverse mix of species may be possible, from high value single trees such as top fruit through to willow for coppicing.

### Barriers to Agroforestry

#### Costs and infrastructure

Establishment costs are a potential barrier and are more challenging in small plantings, where irregular fence lines are required to respond to field boundaries or natural features. Protection of broad-leaved trees which are likely to be used in agro-forestry add significant cost. Agro-forestry support levels must recognise the extra cost of integrating trees into the farmed landscape and supporting multifunctional land-use. Adopting a more flexible approach to tree protection including the use of electric fencing may provide a lower cost solution to tree protection.

#### Agro-forestry on Tenanted Holdings

Woodland establishment on tenanted land is not built into standard tenancy agreements and is not regarded as an agricultural land-use. Small farm woodlands are considered part of agricultural land use, though there is no case law to determine what the upper limit of ‘small’ means in practice. Agroforestry is by definition an agricultural land use and so could in theory be seen as requiring no landlord permission and qualify for consideration for improvement calculations at waygoing. However, there is also no case law to test this assertion. However, the practical and legal aspects of any afforestation of any type are more complicated as on many tenanted farms the landlord interest involves field sports use where trees are seen as problematic and can therefore be objected to. There are a number of issues around this subject which urgently need clarification and development if tenants are to be able to access this sequestration option (see paper on “tree planting by tenants on agricultural holdings’ to be presented to the Tenant Farming Advisory Forum, 10th March 2023).

 Clearly the obligations mapped out by FWN 10 and FWN 30 include woodland and agro-forestry options; on some holdings tree planting may be an appropriate option. Opening up agro-forestry or woodland establishment to the tenanted sector must be a priority. – Changing the designation of approved agro-forestry models to an agricultural land-use and aligning tenancy agreements with the biodiversity and sequestration standards required by Government may provide a helpful baseline to nudge the development of landlord tenant agreements.

#### Impact of deer populations

It is well understood that deer and other wild herbivores can be a major barrier to the successful establishment of new woodland of any type, along with the regeneration of existing woodland. Effective local control is essential and the Deer Working Group Report (2019) is relevant, the accepted recommendations currently awaiting implementation.

Payments (currently in AECS) may be required for many farms undertaking agroforestry and impacted by deer including deer fencing and deer control incentives currently only available for ‘open range’ designated hill ground which should be applicable to agroforestry land.

Appendix 1

**Grant Design Framework for Scottish Agroforestry: New Planting Vs 3**

**A Barbour & L Sumsion**

Introduction

The term ‘Agroforestry’ traditionally refers to any land use system where an agricultural ‘crop’ is produced on the same parcel of land as a tree/bush crop (ref: [Borelli, S et al: 2019. Agroforestry and Tenure](https://www.fao.org/3/CA4662en/CA4662en.pdf)). Crop is defined in the widest sense: livestock, arable, horticultural or fruit/nuts. Various reports and experience in the UK and in other temperate countries have identified agroforestry as an important mitigation and adaptation measure in the land use sector in addressing both the climate and biodiversity challenges. Agroforestry can deliver a wide range of multiple benefits, that neither agriculture of forestry can deliver in isolation. This paper looks at grant support design for the creation of new agroforestry, recognising that this is just one of the key components needed for the widespread uptake of this land use approach. Importantly any new grant scheme will need to be accompanied by the development of an advisory capacity and a mechanism to drive uptake at the farm level, such as farm contracts ([ref Farming 1.5 report; From here to 2045](https://www.farming1point5.org/reports)). Grant rates are deliberately not included here. The identified objectives are those that could be fairly assumed to be relevant, recognising the multiple benefits of this approach in the delivery of multifunctional land-use, which addresses both the carbon and the biodiversity crises.

This paper uses the definition terminology as used in the ClimateXchange Paper [‘The potential for an agroecological approach in Scotland: policy brief’](https://www.climatexchange.org.uk/research/projects/the-potential-for-an-agroecological-approach-in-scotland-policy-brief/) L. J. Cole et al (2021) with one addition to cover horticulture. The paper identifies different models which could have application in the very different farming systems found across Scotland but recognises that specific areas may need specific design criteria (e.g. islands). It should be noted that this ClimateXchange paper has used the term ‘agroforestry’ to mean ‘trees on farms’ and this paper allows for that by including hedgerows, shelter belts and riparian woodlands. However these types do not meet the traditional definition of agroforestry and have a long history of grant support. Only brief mention of these is therefore made here and the focus is on those forms of agroforestry which either have limited or no support measures in place.

It should also be noted that management of existing ancient wood pasture is not included here, being covered by existing guidance and current support measures ([Sustainable Management of Forests – Woodland Grazing](https://www.ruralpayments.org/topics/all-schemes/forestry-grant-scheme/sustainable-management-of-forests/woodland-grazing/)).

Table 1: silvopastoral (livestock only)

|  |  |  |  |
| --- | --- | --- | --- |
| Category  | Sub-category | objectives | Eligibility criteria |
| silvopastoral | Low density rough grazings | * Carbon sequestration
* Biodiversity
* Water management i.e. flood risk or drought mitigation
* Stock shelter, grazings
* Improved grazing quality
* Fuel wood
 | * stocked area 60%
* Min stocking rate 500/ha
* Min tree/shrub ratio 2:3
* Native species suited to ground
* Min area: 0.25 ha
* Max area 20 ha
* Stock to be excluded for initial establishment phase (minimum 5 years), re-introduced under agreed monitoring protocol (See [Sustainable Management of Forests – Woodland Grazing](https://www.ruralpayments.org/topics/all-schemes/forestry-grant-scheme/sustainable-management-of-forests/woodland-grazing/))
* Grazing plan to suit identified NVC types on open ground
 |
|  | Higher density rough grazings | * Carbon sequestration
* Timber production
* Biodiversity
* Water management i.e. flood risk or drought mitigation
* Stock shelter, grazings
* Improved grazing quality
 | * Stocked area 60%
* Min stocking rate 1000-1200/ha
* Minimum tree/shrub ratio 3:1
* Native species (including pine) with specific additions eg sycamore, some willows, to suit site
* Min area 0.25 ha
* Max area 20 ha
* Stock to be excluded for initial establishment phase (minimum 5 years), re-introduced under agreed monitoring protocol (See [Sustainable Management of Forests – Woodland Grazing](https://www.ruralpayments.org/topics/all-schemes/forestry-grant-scheme/sustainable-management-of-forests/woodland-grazing/))
* Identify planting pattern (to follow guidelines to cover landscape impact of alley / group planting designs
* Grazing plan to suit identified NVC types on open ground
 |
|  | Improved land and/or grade 5 land | * Carbon sequestration
* biodiversity
* Stock shelter and grazing
* Water management i.e. flood risk or drought mitigation
* Air pollution mitigation
* fuelwood
 | * Minimum stocking rate 200/ha
* Grade of land: 5 or higher
* Individual tree protection as per agreed guidance (eg to include cactus guards)
* Tree species to suit site, including pine
* Min area 0.25 ha
* Max area 2ha
 |
|  | Traditional orchards | * Fruit production
* Carbon sequestration
* Stock grazing/shelter
* Biodiversity
* Tree hay
 | * Max fruit tree density 400/ha
* Min area 0.25 ha
* Max area 2 ha
* Minimum root stock type:?
* Fruit type to suit local conditions and shelter
* Maximum elevation?
* Minimum tree protection for voles/rabbits/deer (as per guidance)
 |
|  |  |  |  |

Table 2; Cropping models : Silvoarable, Agrosilvopastoral (mixed farms), Silvopoultry and silvohorticulture

|  |  |  |  |
| --- | --- | --- | --- |
| category | Sub category | objectives | Eligibility criteria |
| Silvo-arable | Alley cropping | * Fruit production
* Agricultural cropping
* Carbon sequestration (both soil and trees)
* Biodiversity
* Integrated pest management
* Water management
 | * Grade of land (3.2 or higher)
* Minimum of 7% of field under trees/permanent grass alleys
* Submission of alley design, crop protection plan
* Tree protection for voles/rabbits/roe deer (as per guidance)
 |
| Agrosilvopastoral | Alley cropping | * As per silvo-arable plus:
* Firewood / biomass production
* Stock shelter/grazing
 | * As per silvo-arable plus:
* Tree protection for stock as per guidance for silvopastoral improved pasture
 |
| Silvopoultry | Free range woodland/Alley cropping | * Shelter for poultry
* Carbon sequestration
* Landscaping
* Air pollution mitigation
* biodiversity
 | * As per silvopastoral improved pasture model but with adjusted tree protection for voles and rabbits
* Existing free range poultry business or business plan of new business
 |
| Silvo-horticulture | Small scale market garden alley cropping | * Alley cropping for shelter for vegetable beds
* Production of wood fibre for composting
* Carbon sequestration
* biodiversity
 | * Minimum alley design (width / length)
* Horticulture business or business plan of new business
 |
|  | Large field scale horticulture alley cropping | * As per small scale model
 | * Alley cropping as per silvo-arable
 |
|  |  |  |  |

Table 3: other woodland / hedgerows on farms

|  |  |  |  |
| --- | --- | --- | --- |
| category | Sub-category | objectives | Eligibility criteria |
| hedgerow |  | * Carbon sequestration
* Biodiversity
* Landscape
* Shelter for stock
 | * As per current guidance
 |
| Small scale woodland | Shelter belts | * Side shelter for stock
* Carbon sequestration
* Air pollution mitigation
* Biodiversity
* Water management
 | * as per current guidance
 |
|  | Riparian woodland | * as per shelter belts
 | * as per current guidance
 |

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1. A range of management systems may be associated with botanical diversity or the maintenance of diverse habitats. Agri-environment schemes have formalised and mapped recognised positive management options. Some agroecology and regenerative practices also contribute to biodiversity; however they have not been systematically recorded or mapped. Both management approaches may contribute to biodiversity value. [↑](#footnote-ref-1)
2. Under the new EU CAP rules (GAEC 8) arable farmers will need to have 4% of their holding devoted to non-productive areas and features (including land lying fallow). There is further rules supporting farmers to choose to devote 7% of their holdings to non-productive features as part of an eco-scheme. GAEC 8 further restricts the removal of any landscape features [↑](#footnote-ref-2)