National Forestry Stakeholder Group
Meeting April 17, 2024

Improving Biodiversity across all forests and woodlands

Purpose

This paper aims to frame the topic of forests and biodiversity in Scotland. It sets out the current strategic context and policy framework and key evidence and monitoring. It outlines a number of challenges as the basis for discussion and sets out tools enabling practical implementation across all of our forests. It does not try and cover all implementation and delivery activity. It is intended to enable discussion at the meeting.

Summary and Key points from the paper

- Biodiversity is declining. New international commitments and domestic Scottish Strategies and associated delivery and action plans seek to address this.

- The National Forest Inventory data on woodland Ecological Condition (WEC) is the most comprehensive assessment we have of forest ecological condition across all our woodlands and provides a strong baseline proxy measure for biodiversity.

- WEC measures show the characteristics of our woodlands that are needed to increase biodiversity. All our woodlands of all types be it productive broadleaved, conifer, native or mixed, have the potential to contribute to biodiversity gain in Scotland by having more of these characteristics.

- Challenges for improving woodland biodiversity are grouped for discussion as follows: resilience to climate change, managing over-grazing, woodland management and creation, and resourcing.

- Key next step on research: building on WEC to measure biodiversity across all woodland types and assess how they and associated biodiversity may be impacted by climate change.

Questions for discussion:
- *Considering the challenges outlined and identifying any others, what is the top priority for increasing biodiversity in all woodlands with a 3 degree increase in temp looking more likely by the turn of the century?*

- *What new tools or approaches could be developed to support practical application of biodiversity improvements across all woodlands (and deliver the SBS, SFS, CCP and SNAP3) whilst also contributing to wider government objectives and SFM?*

SECTION 1 - Context and Policy Framework

1.1 Context

Biodiversity – the diversity within species, between species and of ecosystems – is declining globally, faster than at any other time in human history. The IPBES Global Assessment of Biodiversity (May 2019) describes the pressures on nature. Globally there has been an 83% population decline across freshwater species, a 60% population decline across vertebrate species and a 41% decline of known insect species. Over 85 per cent of wetlands (area) has been lost, 50% of the world's coral reef system has been destroyed and 32% of the world's forest area has been destroyed.

Biodiversity loss and ecosystem collapse is one of the top five risks in the World Economic Forum's 2020 Global Risks Report. They also list 5 reasons why biodiversity matters: it makes the earth habitable; underpins global nutrition and food security; helps fight disease, benefits business, and provides livelihoods.

Forests[1] are one of the most biodiversity rich habitats on the planet. Forests and woodlands support a diverse range of species and are rich in biodiversity; to date, researchers at Stirling University have recorded over 1000 species associated with Scottish forests, including 172 protected species.

While there is a clear need to protect Scotland's Nature to avoid losing our iconic species and habitats, and therefore a key part of our national identity, there is also value to our natural environment, which helps to underpin a sustainable healthy society. Nature provides ecosystem services for our communities and economy such as flood mitigation, air and water purification. Functioning ecosystems in good condition, fundamentally driven by biodiversity, will deliver better services and more resilience in the face of climate change impacts.

Scottish Government recognises that biodiversity is vital for us all and it is in crisis, globally, and that we need to change the way we use our natural resources. The section below sets out the key relevant but **not exhaustive**, international and domestic policies and strategies relevant to biodiversity.

1.2 International framework on biodiversity

Hosted by China and Canada the United Nations Convention on Biological Diversity (CBD) held its fifteenth Conference of the Parties (COP 15) in December 2022. At COP 15 the Kunming-Montreal Global Biodiversity Framework (GBF) was adopted, notably including four global goals for 2050 and 23 global targets for 2030. The GBF targets update and replace the Aichi targets adopted in 2010 at COP 10 in Japan.

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[1] The terms forests and woodlands are used interchangeably in this paper. They are defined as land under stands of trees with a canopy cover of at least 20%, or having the potential to achieve this, including integral open space, and including felled areas that are awaiting restocking (replanting). The minimum area is 0.1 ha and there is no minimum height.

The GBF targets address urgent biodiversity action to be completed by 2030. The targets include:

- Restore 30% of all degraded ecosystems and conserve 30% of land, waters, and seas.
- Reduce the introduction of invasive non-native species by 50% and minimise their impact.
- Minimise the impacts of climate change on biodiversity and build resilience.
- Restore, maintain and enhance Nature's contributions to people (ecosystem services).
- Enhance biodiversity and sustainability in agriculture, aquaculture, fisheries, and forestry.

Although the GBF is not legally binding, it requires countries to monitor and report on their progress against the GBF's goals and targets every five years or earlier. The sixteenth Conference of the Parties (COP 16) is scheduled to convene in Columbia in October 2024. COP 16 will review implementation of the GBF.

1.3 Scotland policy framework on biodiversity

Scotland's first biodiversity strategy, Scotland's Biodiversity: It's in Your Hands, was published in 2004, with a significant update, the 2020 Challenge for Scotland's Biodiversity, being published in 2013. The update addressed the Aichi targets within a Scottish context.

Following a consultation, a new Scottish Biodiversity Strategy was published in draft in December 2022. It was published in draft to ensure that the outcomes of COP15 could be incorporated into a final strategy.

A further consultation on Scotland's Strategic Framework, included the final draft Scottish Biodiversity Strategy, the first in a series of five-year Delivery Plans and elements of the proposed Natural Environment Bill,

The initial analysis of the consultation responses has highlighted that respondents welcomed the ambition but there was a desire for more SMART objectives, clarity on priorities, identification of lead organisations and that a spatial approach was considered to underpin the strategy and overlapping policy initiatives.

1.4 Scottish Forestry Strategy (SFS)

Biodiversity is embedded in four Key Priorities of the Scottish Forestry Strategy (SFS) in relation to ensuring Sustainable Forest Management, increasing the area and resilience of our woodlands and forests, and enhancing environmental benefits.

It is a key element of Sustainable Forest Management (SFM) - at the second Ministerial Conference on the Protection of Forests in Europe in 1993, sustainable forest management was defined as: *The stewardship and use of forest lands that maintains biodiversity, productivity, regeneration capacity, vitality and potential to fulfil now and in the future relevant ecological, economic and social functions at local, national and global levels and that does not cause damage to other ecosystems.*

Scottish Ministers have a duty to promote SFM as set out in the Forest and Land management (Scotland) Act 2018.

Scottish Forestry has a programme of work on Forest Resilience commenced with this National Stakeholder Group paper on [Building Resilience Future Forests](#), and now being taken forward in conjunction with a cross-sector [Steering Group](#). Whilst this paper focusses mainly on biodiversity, we recognise the strong link between resilience and biodiversity, and where appropriate in evidence development, policy and management options are seeking to address these two key areas together.

The Scottish Forestry Strategy sets out the key aim to increase our woodland cover in Scotland to 21% and this new woodland creation is a mix of woodland types.

1.5 Scottish National Adaptation Strategy

The Scottish National Adaptation Strategy (SNAP3) is currently out to consultation and is mentioned here due to the explicit mention that climate change is the biggest threat to Scotland's wildlife and habitats: *changing rainfall patterns, water scarcity, flooding, extreme heat, and wildfire, are all impacting the rate and extent of terrestrial [species]… losses across Scotland. The negative consequences on native species, [from these threats]…are already thought to be increasing.*

The Convention on Biological Diversity (CBD) also advise that *'regional impacts of climate change, especially interacting with other land use pressures, might be sufficient to overcome the resilience of primary forests, pushing them into a permanently changed state. If forest ecosystems are pushed past an ecological 'tipping point,' they could be transformed into a different forest type, and, in extreme cases, a new non-forest ecosystem state (e.g. from forest to savannah). In most cases, the new ecosystem state would be poorer in terms of both biological diversity and delivering ecosystem goods and services.*

1.6 The Climate Change Plan

The Climate Change Plan sets out policies and proposals up to 2032 as part of the journey to the net zero target by 2045 with a 75% reduction in emissions by 2030. As the Plan sets out nature-based solutions such as woodland creation will reduce emissions and help us adapt to the impacts of climate change in line with Scotland's Climate Change Adaptation Programme

1.7 Scotland's National Strategy for Economic Transformation

This sets out a vision that by 2032 Scotland will be a wellbeing economy – an economic system which serves the collective wellbeing of current and future generations within safe ecological limits, placing people and the planet at its core. Underpinning this is a commitment to work across society to deliver lasting action that secures a just transition ensuring that economic change is managed in a way that is fair for all.

1.8 The Environment Strategy

This Strategy creates the overarching framework for Scotland's strategies and plans on the environment and climate change. It contains six outcomes including Scotland's nature is protected and restored with flourishing biodiversity and clean and healthy air, water, seas and soils.

1.9 National Planning Framework 4 (NPF4)

The National Planning Framework is a long-term plan for Scotland that sets out where development and infrastructure is needed, in a way that safeguards nature and gives all of Scotland's people access to the wellbeing it provides. NPF4 includes strengthened protection for native woodlands across Scotland and incorporates the Control of Woodland Removal Policy.

1.10 Land Reform

Scotland's forthcoming land reform bill seeks to reform the way Scotland's land is used and managed to ensure greater benefit to communities and the environment.

1.11 Scotland's Vision for Agriculture

The vision and associates Agricultural reform programme outlines Scotland's aim to transform how farming and food production in Scotland is supported, meet food needs sustainably and to farm and croft with nature, including more integrated with other land uses such as woodlands and forestry.

SECTION 2 - How do we measure woodland biodiversity?

Biodiversity here is taken to relate to the presence, abundance, and functional diversity of species. These species can include widespread, commonly encountered species, but also more highly valued species (e.g. species of conservation interest, woodland specialists, taxa known to support key ecosystem functions).

Forest and woodland biodiversity monitoring and assessment methods commonly apply proxy measures of biodiversity, or 'biodiversity indicators' that convey information about the wider state of the biological community. There are two categories of commonly used proxies:

- **Taxa- based** which refers to groups of organisms with a common feature or niche in an ecosystem such as birds, butterflies, vascular plants, or lichens.
- **Habitat based** which look at the aspects of the habitat which organisms occupy, and that affect and therefore predict richness, composition, and/or diversity of one or more taxa. Examples of these for forest biodiversity include volumes of deadwood, levels of canopy cover, woodland stand age, and structural complexity.

Because of the relative ease of assessing habitat-based proxies, many of these are now included in country National Forest Inventory's as internationally recognised indicators of Sustainable Forest Management (SFM), and as a primary source of forest biodiversity monitoring data at the national scale. These indicators are also appealing because they can easily be translated into management action.

SECTION 3 - What measures do we have, and what do they tell us about forest biodiversity?

3.1 Habitat based Indicators for woodlands and forests

There are a number of current habitat-based metrics established specifically for our woodlands and forests described below and for more information please see **Annex 1 (tables 1 and 2)**.

- **National Forest Inventory - Woodland Ecological Condition (WEC)**

WEC is the most comprehensive assessment we have of forest ecological condition across all our woodlands and provides a strong proxy measure for biodiversity.   It was developed over a number of years with a Steering Group consisting of all the forest and nature agencies across GB. It complies with data handling required for it to be an Official UK statistic.

It uses fifteen measures to assess woodland condition and compares all woodlands to a theoretical standard. **These measures, indicators or characteristics apply to all woodlands (see Annex 1).** The first assessment round (report 2020) indicated that overall 1.1% fell into the favourable condition category, 94.7% in the Intermediate and 4.2% in the unfavourable category.

For native results showed 3.2% in favourable, 94.3 intermediate and 2.5% in unfavourable.   For non-native results showed 0.1% in favourable, 94.2% in intermediate and 5.8% in favourable. The next report is due in 2025 (see **Annex 1** for results diagrams and **Annex 2** for further information on WEC).

The large intermediate category could be due to the age of the woodlands with a lot of woodland in Scotland still being first rotation. The data also shows that native woodland is in slightly better condition, however some non-native woodlands score more highly than native overall.

Based on WEC the top issues affecting all woodlands (more than 40% of woodlands for all categories of woodland are in unfavourable condition for this indicator) are:
- the number of veteran trees
- proportion of open space
- deadwood volume
- herbivore/grazing pressure
- age distribution of tree species (the number of tree age categories)

This shows that if a woodland which could be a mainly productive, conifer, broadleaved, mixed, native, planted, or naturally regenerated has more (less

for grazing pressure) of these characteristics then it will offer greater potential for biodiversity.

As this is a metric that compares all woodland to a theoretical ancient semi-natural woodland, 'occupancy of native trees' (area of native species in uppermost canopy), and 'number of native trees and shrubs' also score over 40% for non and near-native woodland.

Invasive plant species (percentage and cover) scored at about 10-20% for all woodland types. Rhododendron (NFI 2016) was found to be present in about 3.8% of woodlands in Scotland and slightly more prevalent in west coast woodlands (rainforest).

- **Site Condition Monitoring (SCM)**

SCM is a longstanding programme monitoring the condition of designated sites in Scotland as part of a UK national monitoring system. There are 489 protected woodland features, which have been measured 2-4 times over the last 30 years, and the coverage could be considered as a sample of wider native woodland condition.

Reporting up to 2023 showed that 64% of our native woodland were in *'favourable'* condition (with 31% of those in the *'unfavourable recovering'* category). There has been a decline over the last few years of about 1% a year. Naturescot note that the key drivers of poor condition are herbivore damage by deer (sometimes sheep), and *Rhododendron* invasion.

- **Native and Ancient woodland**

The Native Woodland Survey of Scotland (2014) found that 46% of native woodland was found to be in *'satisfactory'* condition for biodiversity, based on a condition index developed specifically for this Survey. The main reason for the low condition score was herbivore (deer) browsing.

Trees for Life recently undertook a four-year survey of every CPI site across Scotland, in a comprehensive study of the health and resilience of Scotland's native and ancient pinewoods. This work showed that showed that the biggest barrier to pinewood recovery was deer over-browsing followed by invasive non-native species, and the impact of fire/lack of regeneration.

In 2019, The Alliance for Scotland's Rainforest published a research paper on the State of Scotland's Rainforests with evidence drawn from published datasets, such as the NWSS and Site Condition Monitoring. They found half of the 125 SSSIs with notified woodland features within Scotland's rainforest zone, were in unfavourable condition due to browsing, rhododendron invasion, and also fragmentation leading to many woodlands being small, isolated and vulnerable.

Significant partnership working and implementation is in train on rainforest restoration, and Scottish Forestry is currently developing a 'Strategic Approach' and funding framework for the Atlantic Rainforest which will be published later this year.

- **FOrest Biodiversity Index (FOBI) and Project Next 100 (PN100) - Public Forest Estate**

Results from production of the FOBI for Scotland's National Forests and Land for 2014, 2019 and 2020 indicate improvements to the biodiversity potential of public forests and surrounding landscapes over this time via increases in their diversity, extent, condition and connectivity.   PN100 goes a step further and models future scenarios with one aspect testing out what would happen if an approach was taken to maximise biodiversity outcomes for example.   A key initial finding is that maximising for one objective compromises the ability to achieve other objectives.

3.2 Taxa based indicators

There are a number of taxa and species indicators however the only taxa-based data where woodland is broken out for reporting is for woodland birds:

- **Woodland Birds**

The woodland bird index is one of the most commonly used indicators of biodiversity. There are twenty-three species in the index and the general trend is an increase in the number of woodland birds with some exceptions. The increase in woodland birds could be linked to increasing rainfall, potentially due to increases in invertebrate availability. The biggest increases, of over 500%, are for chiffchaff, blackcap and great spotted woodpecker. The biggest long-term decrease (-76%) is for capercaillie. Capercaillie declines have been linked to death from disturbance, predation, collisions with fences and potentially a negative effect of rising temperatures.

SECTION 4 - What are the key challenges to improving biodiversity?

As WEC (**Annex 1**) shows there are a number of ways that a woodland can provide the conditions required for biodiversity. Ancient semi-natural woodland and native woodland in favourable condition have the potential to provide the greatest amount of biodiversity. Alongside these we have a rich mosaic of woodlands across Scotland that can all contribute to our biodiversity aims.

We know that woodland with a more productive focus for example, can support significant biodiversity across a wide range of taxa, and for some species, are crucial for the long-term persistence of their populations. Woodland with a productive focus, including conifer with a productive end use, has a huge amount to offer and are an essential part of our considerations on improving biodiversity across all woodlands.

Bringing together the information presented above **four challenges are presented below for discussion: building resilience; managing grazing (deer); active woodland management; and resources.** The sections below do not detail all current action on these.

- **Building resilience -** to climate change risks:

As noted above in section 1, SNAP3 notes that climate change is the biggest threat to Scotland's wildlife and habitats. Scotland is already seeing the impacts of rapid

environmental change harming woodland biodiversity. We are already seeing the impacts of increase storms (storm Arwen), and it is anticipated that climate change will increasingly have impacts on woodlands both direct (fire, storminess, drought), and indirect through reduced resistance to disease and pests.

Scottish Forestry's programme of work on resilience has defined resilience as having 4 elements needed for our forests and woodlands to be resilient: **Resistance** to threats**, Adaptation** to a changing and less predictable environment**,** and the ability to **Respond** when threats occur **and Recover** to the same or future state that still delivers the benefits Scotland needs, be it biodiversity, economic or carbon or all of those.

The Adaption and Resilience Steering Group is currently engaged in developing priorities and actions for building the resilience of all our woodlands across these four areas, and in parallel is starting to take forward work in key areas already identified such as species diversity and future species choice. It is clear in this work that there are substantial linkages between resilience and biodiversity outcomes that are actively being built as the work develops.

The draft SNAP3 includes a key action for Scottish Forestry to *produce a Resilience Action Plan* and this work is currently underway as described above, alongside a key action on increasing productive species choice.

- **Managing grazing at landscape scale –** mainly Deer

High levels of herbivore impact mostly by deer are ubiquitous across most woodlands in Scotland. This damages biodiversity by preventing natural processes especially regeneration and the development of shrub and ground layers, and largely prevents the recovery of key woodland types like upland or montane scrub or riparian woodland. Many native woodlands are in decline with reducing canopy and regeneration unable to establish. It also imposes significant costs on woodland creation and management.

The comprehensive negative effect means that reducing grazing impact is one of the most powerful means we have of restoring and improving woodland biodiversity.

Work has already commenced to modernise Scotland's systems of deer management and to implement the recommendations of the Deer Working Group report, and the SBS delivery plan contains a key action to continue this work on deer: *to substantially reduce deer densities across our landscapes in parallel with ensuring sustainable management of grazing by sheep, to improve overall ecosystem health* (see **annex 1**)*.*

- **Woodland management and creation** – more deadwood and open space, managing invasive species, greater species and age diversity, extent and connectivity.

As shown by a number of WEC characteristics, there is evidence to support that creating more woodland habitat, expanding existing and improving the habitat within and around our woodlands can lead to enhanced biodiversity, reduced fragmentation and increased nature networks and connectivity.

It is important to work a numerous scales as shown by a Forest Research note to looking what environmental features can influence biodiversity at the tree, stand, woodland, and landscape scale. Generally, the more structurally, genetically, and compositionally complex the woodland is, along with being larger and well-connected, it is expected to have higher levels of biodiversity.

The management actions presented to do this align very closely with WEC outcomes being: retaining older (veteran) trees; retaining deadwood; creating open space, and increasing diversity and of tree species and age classes.   These actions are also bolstered by the connectivity and extent of populations, and reducing fragmentation, which also helps maintain genetic diversity. Strategic woodland planting can also increase connectivity at a landscape scale, which can aid species dispersal and large-scale population shifts in response to environmental change.

Other additional actions that can be taken at a management level especially for woodland with productive elements would be for example: planning and managing any operations to prevent adverse impacts, ensuring a mosaic of ages, and ensuring buffering of watercourses and other features.

There are number of tools in place, such as management grants through the Forestry Grant Scheme and Nature for Climate Fund. UKFS and UKWAS contain requirements for management, and there is a significant amount of guidance and tools, to enable active positive woodland management (Section 7).

The SFS, CCP and SBS delivery plan all have increasing woodland cover as a key action. The SFS and SBS also have key actions around woodland management such as… *to increase biodiversity through diversifying age and species mixes, increasing woodland extent and connectivity (and edge habitat), increasing deadwood, and managing grazing and browsing to help facilitate natural regeneration and development of a ground/shrub layer as part of Sustainable Forest Management.*

A key element of the framework is to deliver at a landscape scale for example a key action is to…*identify and facilitate partnership projects for six large scale landscape restoration areas with significant woodland components by 2025 and establish management structures with restoration work progressing by 2030.*

The new Strategic Biodiversity Framework also has further work related to 30x30, Other Effective Area-Based Conservation Measures (OECMs), Natural Nature Reserves, national parks and habitat networks that will also all contribute.

- **Resourcing the restoration and management of our woodlands**

Overcoming the challenges above will require efforts from multiple partners and multiple scales, and the budget and resources to achieve this will remain a key challenge.

We know that positive action for biodiversity and positive management requires significant resource over a significant timescale, and this is especially true for woodland habitat creation and restoration. In some instances, this is provided by direct grant through sources such as FGS, NCF or non-government organisations and charitable funding entities. Woodland management for timber also is one example of where land managers look for funding streams to enable woodland management for broader objectives.

There are challenges with the level of funding available, and we know that to achieve the significant sums required private investment will be needed.   We also know that we are not able to achieve everything everywhere and need to take a more targeted approach. For example, we are developing a strategic approach to rainforest restoration which identifies key areas for initial focus.

The SBS delivery plan for example, has an action to *establish a values-led, high-integrity market for responsible private investment in natural capital.* This will include continuing to develop and enhance the woodland and peatland carbon codes to attract and assist additional investment and develop other codes where appropriate. And also, to *Explore options for the use of biodiversity credits to secure increased levels of responsible private investment in nature* (also section 6.2).

SECTION 5 - Next steps for Biodiversity research and monitoring

5.1 Next steps Research

There are a number of significant initiatives which encompass some biodiversity research such as initiatives research such as Treescapes - a consortium of work funded by NERC and also the three GB forestry authorities, DEFRA's 'Nature for Climate fund', and work underway under the Science and Innovation Strategy for GB.

To build on this, Scottish Forestry, in liaison with Forest Research, are looking to take forward a new strategic and ambitious project on biodiversity to help us inform management of all our woodlands for biodiversity, in light of climate change. This project is currently in the development Phase with an aim of starting Phase one in Spring 2024. It has the following aim:

- **To inform the creation and management of our woodlands and forest types in a way that will support biodiversity at all forest developmental stages, so that the contribution that forests make to alleviating the biodiversity crisis can be enhanced and they, and associated biodiversity, are able to survive and adapt to climate change.**

Considering threats from climate change, pests and diseases and steep declines in biodiversity, there is an urgent need for an improved understanding of biodiversity associations with different forest types, and how this biodiversity is shaped by forest management and can be predicted to change with expected levels of climate change, so we can better plan and manage our future woodlands.

The work will be split into three phases:
- **Phase 1**: Use WEC to understand what biodiversity is supported by different forest types in GB.

- **Phase 2**: Collection of empirical data (such as eDNA) to build on WEC, and further inform a picture of biodiversity in different woodland types. Look at forest management stages.

- **Phase 3**: Consider relative vulnerability of the forest types and associated biodiversity to climate change – will some taxonomic groups not survive a 3.5 degree temperature rise? Consider management options to enhance resilience.

The development phase of this work is currently underway, funded by Scottish Forestry, with a view to this being a GB wide project with broader funding sources on commencement of Phase 1-3.

5.2 Next steps monitoring and metrics

- The next round of WEC is due in 2025 which will be the second measurement. FOBI and PN100 continue to be developed for the Public Forest Estate.

- There is the potential to apply a WEC based tool at a local level; something that is currently being trialled in England (see Annex 2). This app-based tool will help woodland managers to help highlight specifically what changes they can implement at the compartment and whole woodland levels to improve scores relating to woodland condition (e.g. volume of deadwood, structural complexity, regeneration, etc). Scoring is aligned with WEC, and there is potential in the future for these data to be collected and aggregated up to national level.

- NatureScot are currently reviewing protected areas SCM in a project called 'Monitoring to Deliver Healthy Ecosystems'. This provides the opportunity to focus on the key attributes that support positive management, adopt new monitoring technologies, and add area and landscape-scale views.

- The draft Scottish Biodiversity Strategy delivery plan includes an action to develop the new Register of Ancient Woodlands, to include locational data, a definition of the required 'protected and restored' condition of ancient

woodlands, and a process for recording ancient woodlands that reach the required standard.

- In addition to the monitoring above there are a number of projects in train to develop a biodiversity metric for a payment for ecosystem services approach, (as noted in Section 4 under the resourcing challenge). For example, a new project is looking at how biodiversity could be credited in the Woodland Carbon Code and Peatland Code.

SECTION 6 - Guidance and tools to enable practical management of woodlands for biodiversity.

In addition to the strategic policy drivers, monitoring and research mentioned above there are a number of regulatory and delivery levers and tools in place, and in development to enable and inform practical forest management to increase biodiversity such as:

UK Forestry Standard (UKFS) and Practice Guides: The UKFS outlines the UK governments' approach to SFM, and all land managers that receive a grant under FGS must adhere to the UKFS. It sets out a number of requirements and guidelines, to conserve and enhance biodiversity including ones on the top issues identified above in section 3 (veteran trees, deadwood and open space). There has recently been a review of the UKFS and the latest version will commence on 1 October 2024. Supporting the UKFS are a number of practice guides and guidance notes.

UKWAS: The UK Woodland Assurance Scheme is an independent certification scheme to verify responsible forest management and is used for Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC). The scheme requires owners to go beyond minimum requirements, in particular for environmental protection. In 2018, 58% woodlands in Scotland were certified.

Forestry Grant Scheme: Measures to enhance biodiversity qualify for grant funding under the Forestry Grant Scheme. This includes a range of forest management and actions that benefit habitats and species such as deer management and rhododendron control. Woodland Creation and Long-Term Forest Plans provide a tool in which delivery actions are approved.

Forest Planning Tools: There are a number of Forest Planning tools that can help to ensure that the woodland planted is suitable for that site.   For example, Ecological Site Classification: (ESC) is a tree species suitability tool, which, alongside a Climate Matching Tool to enable selection of the right choice of species and provenance for the site. ForestGALES ensure that consideration has been given to the wind risk of the site.   The **Woodland Grazing Toolbox**, helps help land managers to support livestock management.

SECTION 7 Summary

- As described in section 3, WEC is a key tool to monitor all our woodlands and forests at a national level with fifteen indicators that can be used as a proxy for biodiversity.

- To build on this solid foundation new research is in development by Scottish Forestry as discussed in section 6 above, to collect empirical data and provide new evidence on how we support biodiversity and enable it to adapt.

- Alongside climate change we have other challenges of managing our grazing herbivores and active positive woodland management and creation, alongside resourcing to achieve these at the scale required.

Questions for discussion:
- *Considering the challenges outlined and identifying any others, what is the top priority for increasing biodiversity in all woodlands with a 3 degree increase in temp looking more likely by the turn of the century?*

- *What new tools or approaches could be developed to support practical application of biodiversity improvements across all woodlands (and deliver the SBS, SFS, CCP and SNAP3) whilst also contributing to wider government objectives and SFM?*

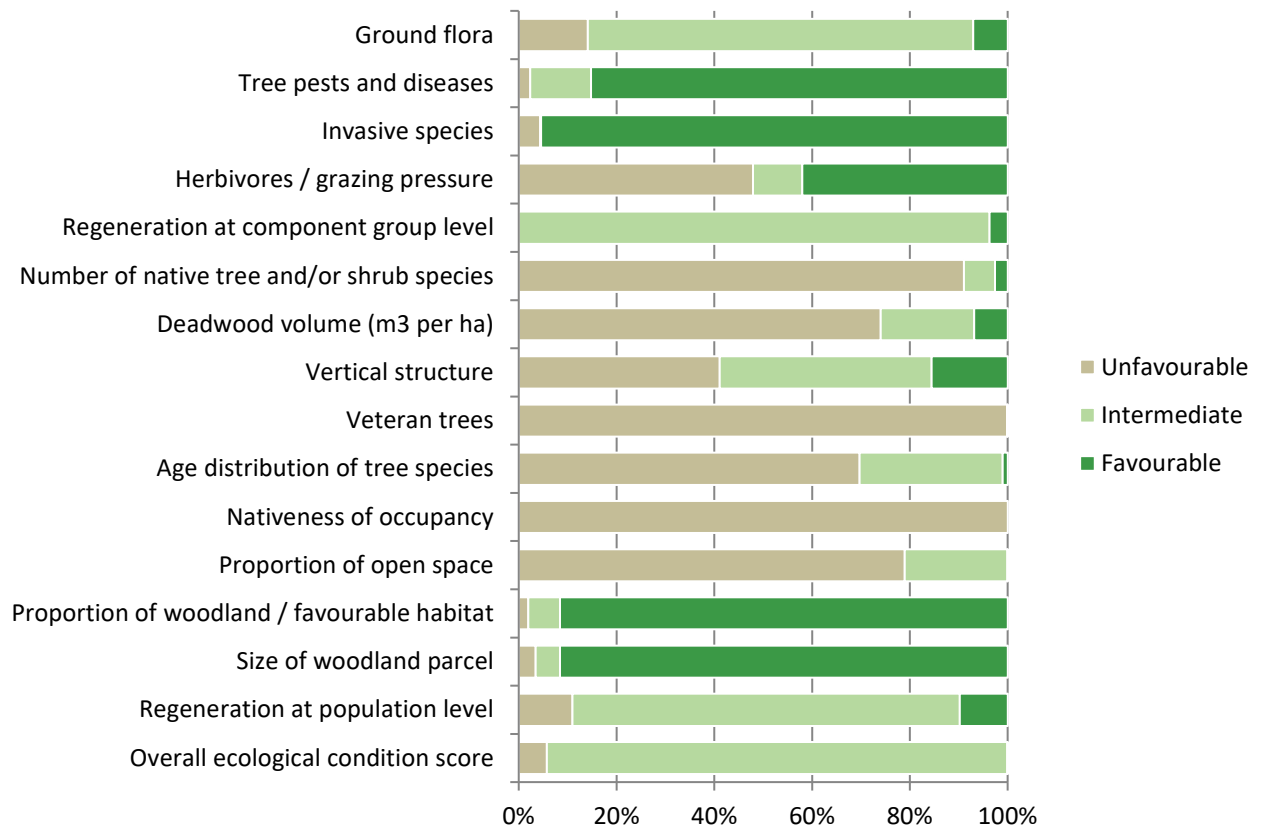**Helen Sellars, Scottish Forestry**

Figure 1 The proportion of each woodland ecological condition class, for each WEC indicator type in non-native woodland stands in Scotland.
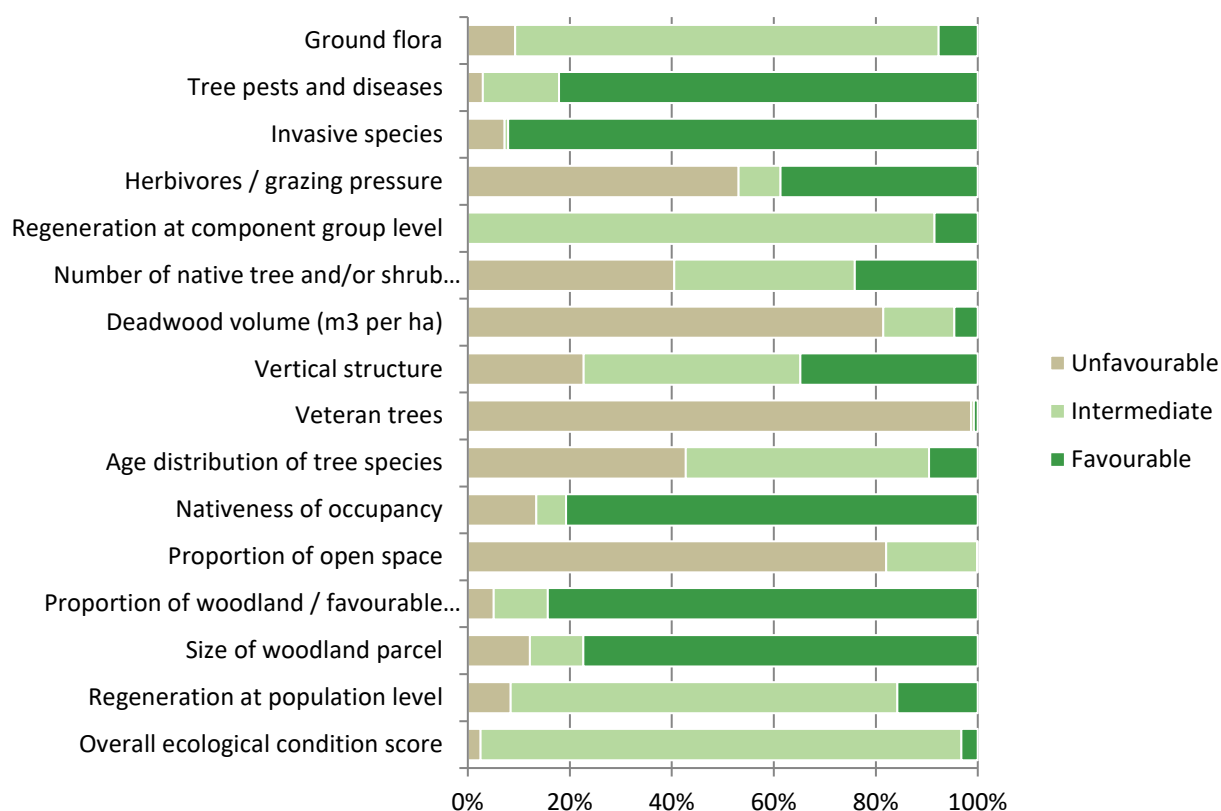
Figure 2 The proportion of each woodland ecological condition class, for each WEC indicator in native woodland stands in Scotland
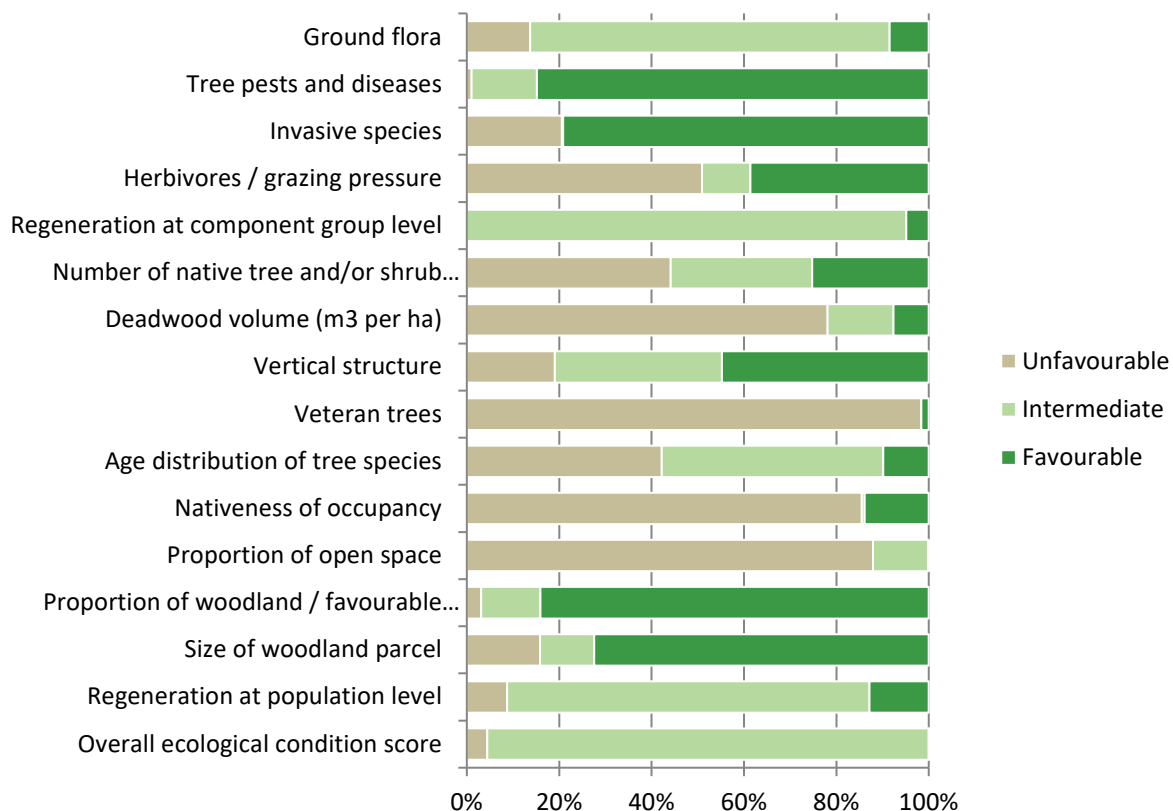
Figure 3 The proportion of each woodland ecological condition class, for each WEC indicator in near native woodland and fragments in Scotland

ANNEX 2   Further information on Woodland Ecological Condition (WEC)

The National Forest Inventory (NFI) is a rolling monitoring programme designed to provide accurate information about the size, distribution, composition and condition of Great Britain's forests and woodlands.

The NFI comprises (1) an earth observation programme to identify the location and extent of woodlands and (2) a fieldwork programme to assess woodland composition, structure and condition within 5,000 one-hectare NFI sample squares.

The NFI covers any forest or woodland in Great Britain of at least 0.5 hectares, with a minimum width of 20m and that have at least 20% tree canopy cover. It is one of the sources of the official National Statistics on Forestry produced annually ([Forestry Statistics and Forestry Facts & Figures - Forest Research](#)).

To assess woodland ecological condition in Britain, the NFI measures fifteen ecological indicators, in 5,000 sample squares across all woodlands every 5 years. These are then compared against a benchmark of an ancient semi-natural woodland (ASNW) in good condition for all woodland types, enabling a score of condition to be calculated.

The thresholds for classifying a woodland as either "favourable," "intermediate", or "unfavourable" status is made against the good condition ASNW. Numerical scores are assigned to the 15 indicator categories and then combined into a composite score. The classifications are broken down as:
- favourable (score 36-45),
- intermediate (26-35), or
- unfavourable (16-25).

For example, *vertical structure* is one of the fifteen indicators and for that a favourable score was given if there were 4 storeys or more, intermediate if there were 2-3 and unfavourable if 1 storey. The favourable threshold was set to two or more veteran trees per hectare (equivalent to ≥40 per 20 ha), as an estimate of the probable occurrence of veteran trees in semi-natural woodlands in good condition, developed with consultation with experts from Forest Research and Naturescot/Natural England.

There is one round of data currently available, with the next set of date due to be published in 24/25.