**Sustainable Renewable Advisory Group – Paper 3 – Agriculture, Land Use and Natural- Based Solutions**

## Purpose

1. This is one of a series of 'deep dive' papers for discussion by the Sustainable Renewal Advisory Group. Each paper is an extract of the issues, opportunities, risks and challenges for the specific sectors covered by the relevant paper. Further discussions will provide an opportunity to consider these issues in the wider context and to propose issues for consideration by Ministers on the interactions with other sectors and the associated implications for other sectors including economic and supply chain impacts and any trade-offs that may be needed. Each paper should be seen in the context of the other deep dive papers.

2. In this context the purpose of this paper is as follows:
   - To provide an overview of the scale of the challenge of decarbonising Scottish Agriculture and main activities required to increase the carbon sequestration capacity and ability to contribute to nature restoration of the Land Use, Land Use Change and Forestry (LULUCF) sector
   - To highlight some of the interdependencies and interactions between the two areas – namely the availability of land - as well as with other sectors
   - To identify the potential opportunities including quality jobs and growth
   - To draw attention to the challenges including technical, behavioural and policy barriers
   - To ensure that issues around the cumulative impacts on rural communities are considered within the discussion.

## Background to Agriculture sector

1. Our rural economy must be at the forefront of our economic and environmental recovery. We must build a sustainable food production sector for future generations whilst also contributing to greenhouse gas emissions reduction, carbon sequestration as well as helping to improve bio-diversity, air and water quality for the whole of Scotland.

Nature loss, soil degradation, declining water quality and a changing climate (bringing increased pests/diseases and extreme weather) all put future food security at risk. Tackling these changes is essential for Scotland to continue to produce food. A fine balance must be found to ensure Greenhouse Gas reductions and nature restoration can take place while Scotland continues to produce secure and sustainable food. Scottish agriculture and the food supply chain continue to play a key role in feeding Scotland.

   - Comment: *How is 'secure food' being defined? If it is linked to food security the government must lead a conversation about how to achieve this.*

2. The agriculture sector is currently facing significant uncertainty while managing and recovering from the impacts of Covid. Brexit presents key challenges around trade (food and drink exports as a whole are approximately four times more important to the Scottish economy than for the UK as a whole), potential tariffs and the loss of the security of CAP support.

**Key challenges:**

3. Delivering on multiple land use pressures - food production, forestry, peatland restoration, bio-energy feedstock production, habitat restoration and settlement expansion and development are all competing priorities for Scotland's limited land bank, of which 69% is agricultural land.

4. Securing maximum uptake of applicable low carbon, high nature value farming practices - it is through these practices that Scottish farmers and crofters can reduce their on-farm emissions, improve biodiversity and build resilience to climate change.

5. Healthy and sustainable dietary habitats - the CCC have indicated that a reduction in the consumption of red meat and dairy products of around 20% per person, across the UK is required in order to meet the climate targets. Through the consumption of high quality Scottish produce including red meat and dairy products at a healthy level we can work with our food production sector to ensure the food we eat is produced in a truly sustainable manner.

   *Comment: what is a 'healthy level' and how does this compare to what we currently produce?*

~~5.~~6. Plant health – Climate change is increasing the ~~Scotland is now under~~ threat of pests and diseases spreading that previously wouldn't have been viable until recently, in addition tightening regulatory controls around pesticide approval and use is leading to a reduction of chemical controls options available to the farming sector.

~~6.~~7. Future Funding and Trade - The uncertainty from the UK government surrounding future funding and future trade deals, decision made will have a direct impact on Scotland's agricultural sector.

~~7.~~8. A Just and Fair Transition – Rural Scotland as a whole needs to be given due consideration as Scotland transitions to a net zero economy; for example, two thirds of rural households are estimated to be off the gas network, and rural communities are more likely to experience fuel poverty. There is a need for sustainable rural job creation and retraining/reskilling opportunities for communities.

~~8.~~9. Offshoring - Scotland currently trades a variety of products, including beef and lamb. Without a significant change in consumer behaviour, reducing domestic production to meet Scottish emissions envelopes would almost certainly lead to an increase in imports. Whilst this would help our territorial climate change emissions, it will not help global emissions and, depending on the country of import, could lead to an increase in other countries emissions (as well as related emissions in freight air transport). It is important that while we take steps to reduce emissions from agriculture, we need to recognise that Scotland is well suited to livestock production and our actions should not simply export emissions elsewhere, where there may be a greater emissions impact and a poorer environmental track record in terms of animal welfare and production methods.

~~9.~~10. Brexit - future trade deals may impact food and environmental standards. The Internal Markets Bill, for example, risks a race to the bottom on food standards

**Key opportunities:**

~~10.~~11. Low carbon farming and agro-ecological practices – through embracing applicable practices such as nitrogen use efficiency, improvements in animal health and welfare and use of legumes, Scottish produce could be among the most environmental friendly in the world. This could lead to strong global market position for Scotland moving forwards.

~~11.~~12. On farm diversification – the potential availability of new income stream such as bio-energy generation and feedstock production and carbon off-setting from the privative sector, could benefit the sector in the long term, although scaling up the production of timber and bioenergy feedstocks could contribute to competing for land and diverting resources from other industries, as well as negatively impacting on habitat quality and ecosystem service provision.

~~12.~~13. Future policy design - policy aimed at delivering on a range of government priorities such as climate change, bio-diversity as well as the production of food can help facilitate a truly sustainable future for the sector.

~~13.~~14. Regional Land Use Partnerships – agricultural is the predominant land use in Scotland and it can play a key role in multiple areas. However, the right balance must be struck locally to deliver on national priorities. Regional Land Use Partnerships can have the potential to achieve this.

~~14.~~15. Technology – it is recognised globally that the application of digital technologies including precision agriculture equipment can drive emission reductions and nature protection through efficiencies and improved decision making. Scotland is potentially well placed to capitalise on this.

~~15.~~16. Carbon off-setting - is an opportunity to maximise the funding which can be secured from companies wishing to undertake voluntary offsetting – for example by investment in tree planting which in turn can be taken forward on agricultural land.

~~16.~~17. Opportunities to deliver multiple benefits through the use of nature-based solutions -across the agriculture and LULUCF chapters, nature-based solutions to climate change include: uncropped features e.g. hedgerows in the midst of actively managed agricultural land as well as native woodlands and scrub, peatlands, other wetlands, rivers and species-rich grassland, provided they are healthy. Some agricultural managements systems which are an inherent part of the productive system can also act as nature-based solutions.

~~17.~~18. Redistribution of surplus food – FareShare is a UK-wide organisation that redistributes surplus food to community groups who then provide meals, food parcels and wider support to households and communities. Currently, most of their surplus food supply comes from retail and manufacturing. However, FareShare in Scotland are increasingly looking into accessing food from primary

producers as a way of engaging more closely with the sustainable agriculture and food waste reduction movement.

**Trade-offs**

~~18.~~19. Carbon leakage – Scotland must ensure that actions taken to reduce agricultural emissions do not simply off-shore them to another country. For example reducing domestic production would only likely to lead to increased imports and may indeed lead to an increase in other countries emissions if consumer behaviours do not change.

~~19.~~20. Land use – the Committee on Climate Change imply that around a fifth of agricultural in Scotland will be required to change use. Whilst there are opportunities to be had there will be trade-offs in this transition, and may have implications for our Just Transition commitments.

~~20.~~21. Carbon off-setting – whilst this is an opportunity there is also a risk, off-setting cannot be seen as an alternative to the need for all sectors in the economy to reduce emissions by the maximum level possible. Consideration is needed to prevent off-setting from discouraging companies from taking actions themselves to reduce emissions.

~~21.~~22. Wider environmental priorities – not all emissions reduction practices would be considered environmentally friendly in the wider context for example slurry acidification comes with risks to water, soils and wildlife. However, there are many which would provide substantial benefits to nature and climate, as well as helping to address inequalities and shifting to a wellbeing economy, and should be prioritised.

~~22.~~23. Animal health and welfare – possible emissions reduction practices such as the feeding of nitrates to livestock can result in poisoning and death if not administered correctly.

~~23.~~24. Farmer health and safety – possible emissions reduction practices such as slurry acidification come with not just environmental risks but pose risks to the human health and safety of Scotland's farmers and crofters.

## Background to LULUCF sector

~~24.~~25. Scotland's land has a vital role to play in mitigating climate change through carbon sequestration and greenhouse emissions reductions and the protection and restoration of ecosystem services. In order to meet our targets, we must see a significant increase in Scotland's level of tree cover and area of restored peatland for example. However, in addition to this, the way in which our land-based businesses interact with the land must adapt and evolve. Our land has the potential to not only deliver on climate change, but, if managed appropriately, must also deliver multiple wider benefits to the people of Scotland, including food production, enhanced biodiversity and improved air and water quality.

~~25.~~**26.** Forests in Scotland are a net carbon sink of currently about 9.5MtCO2 a year. They are also major natural asset that supports biodiversity and a range of other

economic, social and environmental benefits, when the right species of tree is planted in the right location. As a net carbon sink, policy action must also prioritise looking after existing woodlands, alongside new woodland creation. For example, around 14% of ancient woodlands have been lost over the previous 40 years mainly in unenclosed upland areas. Such a loss of net carbon sinks is completely avoidable through better land management and integration of land uses.

~~26.~~27. Woodland creation will add to our net carbon sink in the medium to long term. Over 22000 hectares of new woodlands have been created over the past two years, in line with planting targets in the Climate Change Plan. The 2020-21 Programme for Government allocated an additional £100 million to Scottish Forestry over the next five years to increase new planting to 18000 hectares a year by 2024-25. It also announced £30 million to Forestry and Land Scotland to expand Scotland's national forests and land and a further £20 million to support the FLS nursery, thereby expanding capacity and improving resilience of the supply of young trees for the public sector.

~~27.~~28. Enabling native woodlands to be in better condition and expand is key to achieving the Net Zero Emissions target. Most native woodlands are in poor condition and cannot regenerate, largely due to overgrazing from wild deer. If the current native woodland target of 3,000 to 5,000ha per year is not significantly increased there will be a massive discrepancy in the type and diversity of woodland covering Scotland. The Just Transition Commission's advice on green recovery calls for increased diversity in tree planting because at scale and over the long-term, native tree species are shown to be better at carbon sequestration.

~~28.~~29. Large-scale habitat creation/restoration of mosaic of habitats would offer great potential for sequestering carbon and reducing GHG emissions from degraded land, as well as improving ecosystem resilience and building natural capital at the landscape-scale. This could have multiplying effects.

~~29.~~30. Peatlands are a key part of the Scottish landscape, as well as our cultural and natural heritage, covering more than 20% of Scotland's land cover.

- In good condition, peatlands remove CO2 from the atmosphere. Conversely, degraded peatlands may emit more CO2 than they remove. Estimates suggest our peatlands store around 1600 million tonnes of carbon. If we were to lose the carbon stored in our peat soils as CO2, it would be the equivalent of more than 120 times Scotland's total annual greenhouse gas emissions.
- As a key component of Scotland's natural capital, peatlands also deliver a number of other nature-based solutions including improvements in water quality and management of downstream flood risk.

~~30.~~31. Biodiversity is fundamental to the LULUCF sector. It is well established that all ecosystem services, the benefits that nature provides to people, are underpinned by biodiversity. If the biodiversity fails or becomes too degraded, then ultimately, the commercial crop (be that agriculture, forestry or peatland) will fail to deliver the intended benefits or products.

**Key challenges post-Covid**

~~31.~~32. It is estimated that over 80% of Scotland's peatlands are degraded. Peatland restoration therefore has an essential role in responding to the interconnected challenges of climate change and biodiversity loss. It is a key strand of emerging thinking on a sustainable and green recovery post-COVID.

~~32.~~33. Whilst Scotland has around 19% woodland cover it remains one of the most heavily deforested countries in Europe, with woodland cover is well below the current European average of 37%. To achieve our targets we must therefore significantly increase our woodland cover, with a focus on native woodland cover.

~~33.~~34. Our new targets mean that there will be significantly increased pressure on the LULUCF sector to deliver additional and accelerated carbon sequestration, which will create substantial delivery challenges for peatland and forestry. There will be considerable financial, planning and behavioural challenges, such as the historic "them versus us" divide between agricultural and forestry land uses, as well as wider behaviours around food consumption and waste, in meeting ambitions for both woodland creation and peatland restoration. It will be necessary to attract significant levels of private finance, to design and locate new woodlands where the greatest emissions removals will be achieved, and to build integration and collaboration with the agriculture sector in order to encourage farmers to plant trees. The Woodland and Peatland Codes are vital to unlock private finance, but a diversity of habitats will require investment to deliver multiple benefits, underpinning the need for a natural assets economy.

~~34.~~35. Delivery of our targets will require more land, including the conversion of better quality agricultural land, to allow woodland and peatland restoration to take place in areas where the greatest emissions removals can be achieved. This will require integration and collaboration with agriculture in order to encourage farmers.

Open habitat including grasslands and moorland are also key to Scotland's transition to a low carbon, nature-rich future. Maintaining and increasing the extent of high nature grasslands, including machair, and increasing the diversity and resilience of moorlands, through better management of wild deer, muirburn and infrastructure planning, is required to maximise carbon sequestration and ecosystem service delivery and build resilience to change.

~~35.~~36. It will be necessary to attract significant levels of private finance to supplement public monies.

~~36.~~37. It will require a change in perspective moving from a simple hectares restored or forested to a view of greenhouse gas emission savings from different transitions across land use.

**Any potential opportunities to support green recovery**

~~37.~~**38.** Investment in diversified woodland creation and in the supply, management and processing activities across the forest sector, will generate significant economic benefits. Wood provides a sustainable material in greening the economy. Investment in woodlands will also support societal well-being and build Scotland's natural capital, with wide-ranging benefits that include physical and

mental well-being, greater levels of biodiversity and natural flood management. Productive woodland must include native as well as non--native species and support a variety of models not just one model as is the current situation.

~~38.~~39. Mechanisms such as the Woodland Carbon Code offer important opportunities to lever increases in private finance. Scottish Forestry aims to increase the woodland carbon market by 50% over the next 5 years through the Woodland Carbon Code. The focus of woodland creation will be in Scotland's rural areas, often in remote locations.

~~39.~~40. We are also looking at opportunities to increase the use of timber in construction to drive new planting. We are collaborating with the Scottish Forest and Timber Technologies Industry Leadership Group to increase the annual volume of Scottish timber going into construction from 2.2 million cubic meters in 2018 to 2.6 million cubic meters in 2021/2022. This work involves supporting research into timber engineering, increasing the understanding of timber as a building material among architects and supporting efforts to increase customer demand. This workstream should also involve the reviving of native hardwoods timber industry, and sustainably growing in Scotland the types of timber that are needed for local use.

~~40.~~41. Opportunities on peatland restoration:

- Our £250m 10 year funding commitment will permit a shift to multi-year large scale restoration projects that deliver scale of restoration and generate confidence in the contractor base to invest in skills and increase capacity.
- Opportunity to lever private sector funding via Peatland Code, particularly to support long-term management of restored peat.
- Redesign of future agri-environment support mechanisms provides opportunity to consider where peatland restoration and management fits in.
- Emerging Regional Land Use Partnerships can offer the potential for peatland restoration to be recognised, planned and delivered on a landscape scale.

~~41.~~42. Looking ahead, we are committed to significantly increasing the rate of peatland restoration as one of the transformative changes needed to meet the targets set out in the Climate Change Plan.

~~42.~~43. In 2019-20 we increased funding by £11 million to a total of £14 million.

~~43.~~44. In the 2020-21 draft budget we announced £20 million for peatland restoration with a commitment to invest more than £250 million over 10 years as the first step of a 10 year £250 million commitment to restore 20,000 ha of Scottish peatland annually, towards a total of 250,000 hectares by 2030.

**Job creation, Skills, Just Transition and Green Recovery**

~~44.~~45. Regional Land Use Partnerships have the potential to garner wider engagement on how national priorities will be delivered at a regional level, an approach in line with Scotland commitment to a Just Transition

~~45.~~46. Forestry supports over 25,000 jobs across Scotland. It offers a range of employment opportunities, including in areas and among demographic groups where job creation is particularly needed; for example, in rural and remote areas and among younger age categories. Scottish Forestry is doubling its recruitment of assistant woodland officers and Forestry and Land Scotland is doubling the number of opportunities for young people (including modern apprenticeships, student placements, etc.), providing an important entry route for future careers in the forestry sector.

~~46.~~47. Restoring degraded peatland supports Scotland's rural economy and can be a plank in our green economic recovery, supporting employment opportunities in rural communities across Scotland. Our significant investment in peatland restoration over the coming 10 years will help to support small and medium size businesses that deliver restoration works, often in remote rural areas, as well as having wider economic benefits to supporting businesses such as hospitality and food services providers. It is estimated that by around 2024, Scottish Government investment in peatland restoration will support over 200 FTE skilled, green jobs across rural Scotland.

48. Farming contributes around 67,000 jobs and a GVA of around £1.3 billion to our economy. It has a potential to contribute to our national recovery from COVID-19 through both job creation and a truly green recovery. As part of a Just Transition and a green recovery, these jobs must be protected, although some may be repurposed.

- Comment: *LINK members agree with the importance of ensuring transition in the Agriculture and LULUCF sectors is just and fair. However, the paper does not give an indication of what a just transition might look like for these sectors. Justice is hugely important but if changes are not made to tackle the climate and biodiversity crisis soon there will injustice further down the line, particularly those sectors specifically reliant on natural capital.*

**Reserved issues**

~~47.~~49. At this time it is unclear what the impact of the UK Internal Market Bill will be on subsidy control which may impact on the design of future support mechanisms and devolved issues such as agriculture.

**Interdependencies between the sectors**

~~48.~~50. There are strong interdependencies across different land-uses – farming, forestry, upland management and peatland – in meeting our emissions reductions targets. Integrated planning and management will be needed to help focus tree-planting in areas where it can best complement other activities. Future land-use policy will be vital in providing appropriate financial and behavioural incentives, including the capacity to blend public and private finance in providing sustainable revenue streams for land managers.

~~49.~~51. The UK Forestry Standard provides comprehensive set of guidance on how to manage woodlands sustainably, based on the latest science. Current analysis on natural capital and the benefits derived from different land-uses is improving understanding about where trade-offs, synergies and dependencies lie.

~~50.~~52. There is significant interaction between agriculture and LULUCF sectors – agriculture will need to play its part in land use changes as we scale up tree planting and restoration and require new land.

~~51.~~53. This has been highlighted by the Committee on Climate Change who imply that around a fifth of agricultural in Scotland will be required to change use. We must also consider wider environmental priorities, and care must be taken to ensure focus is not placed on one priority at the expense of others. This is a particularly relevant with regards to land use, land use change and forestry given the scale and timelines involved in this sector.

~~52.~~54. Another important carbon store, that is not currently accounted for in our National Greenhouse Gas activities, are blue carbon habitats. Nevertheless, these are undoubtedly important habitats both for biodiversity and in terms of carbon stores. The Scottish Government is committed to better understanding blue carbon and how it can help us mitigate and adapt to climate change through the £570,000 within our Blue Carbon Research Programme. Many key marine habitats are also protected through our Marine Protected Area Network and our National Marine Plan.

~~53.~~55. In our 2020-21 Programme for Government we committed to developing a Blue Economy Action Plan to launch a programme of collaborative projects across the public sector, Scotland's science base, marine industries and the marine environmental sector.

**Questions for discussion**

~~54.~~56. In some cases it will not be possible to deliver on all environmental and economic priorities/targets when it comes to the way in which we use and manage our land. What approach should be taken to decide which national priority/target is addressed?

~~55.~~57. The CCC have suggested that red meat and dairy consumption should reduce by 20% in the UK. That assumes a reduction in domestic production – however, this could simply result in no dietary change and offshoring of emissions. How can the emissions from livestock farming in Scotland be reduced without the risk of offshoring? And how do we ensure a Just Transition for agriculture which supports tens of thousands of jobs in rural communities?

~~56.~~58. The CCC have stated that the policies to net zero in land use involve hundreds of decisions by different actors: farmers, government, banks, land agents, industry and the public, which will need to act together to deliver significant emissions reduction in land. This includes significant behavioural changes. How can Government drive this change to secure progress towards net zero, along with the ultimate net zero target, while meeting a Just Transition and nature targets?.

## Conclusion

~~57.~~59. Land use, land use change and forestry combined with agriculture has the potential to offer a great deal to a sustainable future for Scotland. It is however important not to lose sight of one benefit in the pursuit of another.

~~58.~~60. In order to meet our targets our perception of land and how it is used will have to evolve. We require significant land use and management changes and we will not be able to achieve this without a change in mind set.

~~59.~~61. There are opportunities to encourage this approach with the design of future rural support, but challenges in doing so in a just way, while securing the necessary uptake and behavioural change.

## ANNEXES

## Further background on forestry sector

Community woodlands

Scotland's forests and woodlands play an important role in galvanising and empowering communities. Creating new woodlands will provide further opportunities for the development of community based woodlands that foster local cohesion and decision-making. The Scottish Government provides direct support to the community sector through the provision of the Scottish Land Fund, Community Ownership Support Service and works closely with a range of independent advisory bodies supporting communities own and manage assets such as Community Land Scotland and Development Trusts Association Scotland. Since 2005, Scottish Forestry has provided the Community Woodlands Association (CWA) with funding to deliver targeted advice to communities involved in using, owning and managing woodland. In 2020/21 the funding will enable CWA to provide one-to-one support for around 70 groups; including those looking to acquire woodland, develop and deliver woodland projects that support local economic development and undertake woodland planning and management. CWA also provide information and communication on funding, training events and job opportunities to over 250 members and supporters.

Behavioural issues

Decisions about land-use change are often determined by cultural and social issues rather than purely financial considerations. Some farmers may not be accustomed to planting and managing woodlands. Creating new woodlands has long-term implications for land-holdings and brings particular knowledge and skills requirements. In future, it will be important to emphasise the complementary roles of managing farms, woodlands and peatlands and the multiple benefits that this provides.

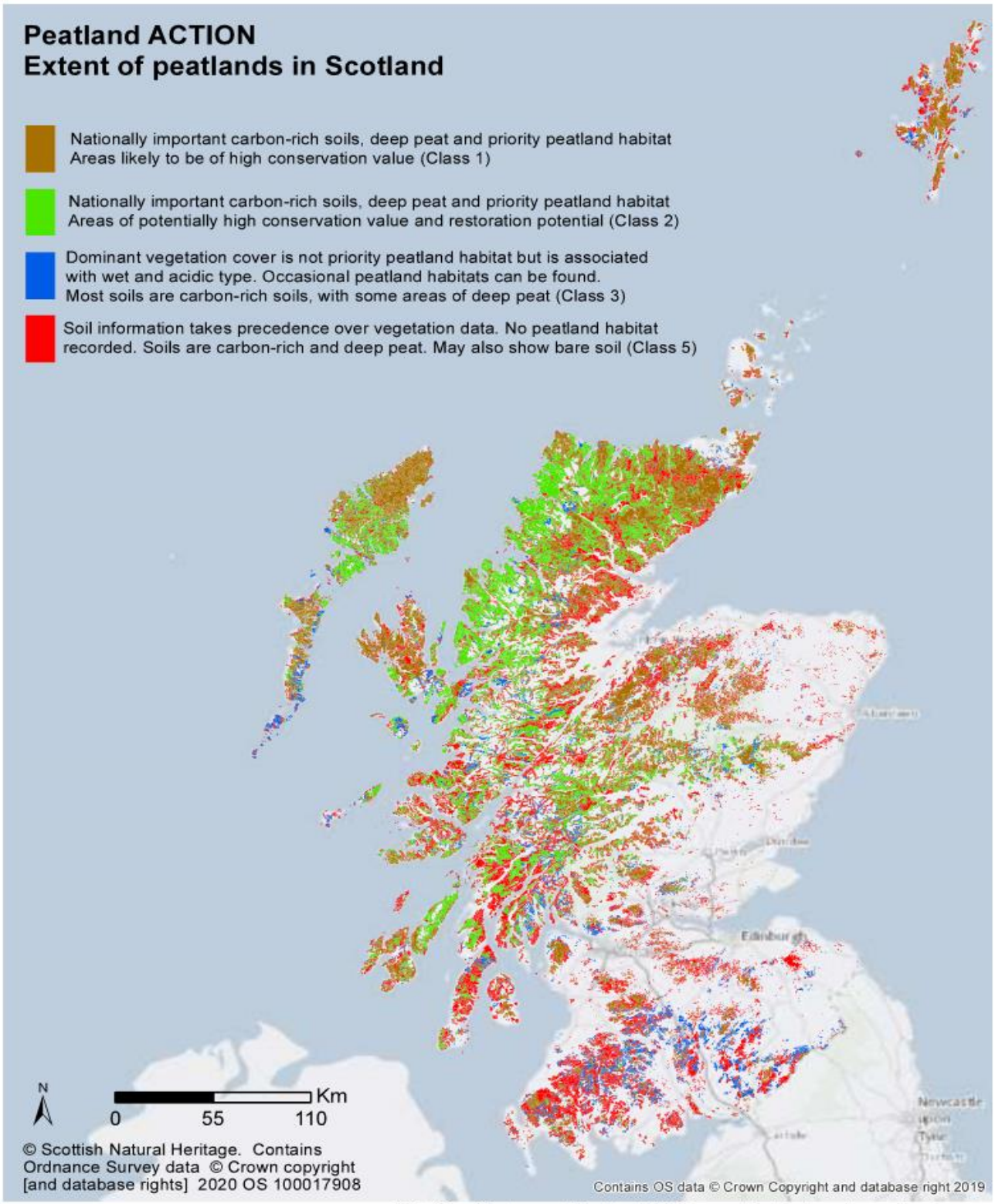
## Biodiversity

The 2019 State of Nature report was published on 4 Oct 2019. The Scotland report produced with NatureScot (formerly Scottish Natural Heritage) working in partnership with Scottish NGOs uses NatureScot data and paints a picture of continuing biodiversity loss in Scotland, like the rest of the UK. Key findings were: 24% decline in average species' abundance; 14% decline in average species' distribution; 49% of species have decreased in abundance; 62% of species show strong changes; 11% of species are threatened with extinction from GB; 38% decline in the Scottish breeding seabird indicator between 1986 & 2016. The report identifies the main drivers of biodiversity loss as agriculture; hydrological change; climate change; urbanisation; invasive non-native species, pests and pathogens; pollution; and woodland management. This is consistent with other reports on the state of biodiversity globally, in Scotland and in the UK, including the 2019 IPBES Global Assessment, and the 2020 fifth UN Global Biodiversity Outlook report.

- Agriculture is the dominant use of land, covering around 70% of Scotland. Historically, intensification of agriculture has been a major cause of biodiversity decline due to loss of traditional farming practices and changes in management.

- The greatest impacts on Scotland's nature over the last 50 years include the increased use of pesticides and fertilisers, continuous cropping, changed sowing seasons and the loss of non-cropped habitats.
- Many Scottish farmers manage their land with nature in mind and show how leaving space for nature with wildlife-friendly practices can have major benefits.
- Humans have been managing the hydrology of catchments for thousands of years. Land has been drained for a variety of purposes. Many of these changes have had adverse effects on wetland and freshwater habitats and species.
- Just under a quarter of Scotland's woodland is considered native. This includes globally important areas of Atlantic rainforest and Caledonian pine forest which are of very high value to biodiversity, but fragmented and restricted in range.
- The remaining three-quarters is mainly commercial forestry plantation dominated by conifers, which benefit a smaller range of largely generalist species.
- Woodlands face pressure from fragmentation, browsing and grazing, new pests and pathogens. Climate change exacerbates these drivers.

Map of Peatland in Scotland




Scottish Natural Heritage
Dualchas Nàdair na h-Alba

Data from Carbon and Peatland 2016 map which is based on soil and land cover map data produced by the James Hutton Institute.
Used with the permission of The James Hutton Institute. All rights reserved