SCOTTISH SOIL FRAMEWORK (SSF)
PROGRESS REPORT

Context and Introduction

The Scottish Soil Framework (May 2009) identified soils as one of the nation's greatest assets, valuable but vulnerable. It listed several threats to soil functions, with climate change and loss of organic matter being the most significant. The Framework was designed to promote the sustainable management and protection of soils. It identified some 13 soil outcomes (eg "soil organic matter stock protected and enhanced where appropriate") to which a wide range of activities would contribute.

Recap of purpose. There were a number of policy instruments in place which provided some protection of soils, but there was no coordination of them. The Framework set out a list of actions, outlined in its Table 7.2. A summary of progress in relation to the 39 actions is given in the Annex, including a brief contribution on the work of the Main Research Providers in relation to Soil Outcomes.

Wider Developments since 2009

Greater Recognition of Soil. Since 2009 there has been an increase in awareness of and concern for soils. Loss of carbon from highly organic soils, with the possibility of averting such losses by re-wetting damaged peatlands, has become a major issue in soils policy, and it features in the second Report on Policies and Proposals (RPP2) for climate change mitigation under the Climate Change (Scotland) Act 2009. General binding rules (under Water legislation) and cross-compliance (GAEC rules) have raised farmers' awareness of the importance of protecting soils from erosion, loss of organic matter and structural damage.

Ecosystem services. The ecosystem approach, given emphasis by the UK National Ecosystem Assessment (NEA, June 2011) and the European Assessment (May 2011), recognises the contributions which soils make to agriculture, forestry and horticulture; biodiversity (and geodiversity); water quality and quantity (flows), among other policy areas. This approach was used in the Report on the State of Scotland's Soils (2011) and in the development of the Soil Monitoring Action Plan for Scotland.

Biodiversity Strategy – Land Use Strategy (LUS): - Roles and responsibilities. The importance of soils, especially in peatlands, is recognised in the Land Use Strategy (2011), and the action plans being developed following it, and in the Scottish Biodiversity Strategy (refreshed in 2013). Soil carbon is recognised, for instance, in the Farming for a Better Climate programme and in the Ecosystem Health Indicators.

Actions/Initiative

Farming for a Better Climate. The Farming for a Better Climate programme has been launched, using the expertise of SRUC, to encourage farmers to adopt practices that assist to minimise GHG emissions. Among the measures

that are being promoted are enhanced facilities for the storage of slurry, greater efficiency in the use of slurry and other manures, and the targeted application of all kinds of fertilisers. The protection of soil carbon, especially in organo-mineral soils, is an important objective; carbon sequestration in grassland was the subject of a workshop at the Edinburgh Centre for Carbon Innovation (ECCI) on 7 November 2013.

Peatlands. The Scottish Government recognises that peatlands which have been drained or otherwise damaged are likely to be emitters of carbon dioxide. There is therefore a presumption, for instance in Scottish Planning Policy, for the protection of peatlands. Where a developer proposes a wind farm on land with substantial quantities of peat, they are expected to carry out an assessment of the carbon cost and eventual benefits, using the carbon calculator; this is mandatory if the wind farm is of over 50 MW. The Scottish Government has proposed in RPP2 that 21,000 hectares a year of damaged peatlands should be restored in the period to 2027, saving an estimated 0.5 Mt CO_2e a year by 2027. Following the Green Stimulus initiative of £1.7m for peatlands in 2012-15, the Scottish Government has announced that £5m will be made available in 2014-15 and a further £10m in 2015-16.

Natural Flood Management. The SSF identified "Soils making a positive contribution to sustainable flood management" as one of its Soil Outcomes (SO6). The threats to be addressed were primarily: soil sealing, soil erosion and compaction. With advice such as that in the Four-Point Plan, farmers are more aware of the importance, both for their business and for the environment, of minimising soil erosion and of maintaining good soil structure. In urban areas soil sealing can increase the damage of flooding following intense rainfall. Permeable paving and other sustainable urban drainage (SUDS) features, such as detention basins, can minimise the risks at modest cost. Willingness to pay for SUDS maintenance has been a problem with new developments; the Scottish Government has drawn attention to the duty that Scottish Water has for drainage in public places (the Sewerage Act (Scotland) 1968).

CAP. Several of the cross-compliance conditions in Good Agricultural and Environmental Conditions (GAEC) relate to the protection of soils, for instance that there should not be gross trampling by livestock of the verges of watercourses. If damage is found, the farmer is allowed time to make good, and thus avoid the risk of loss of part of the Single Farm Payment. In Rural Priorities farmers may apply for funding of up to 50% (60% for young farmers) of the cost of slurry storage; some £30m has been disbursed in the current SRDP. This enables farmers to apply slurry at times and in conditions when it is of agronomic value and the plant nutrients are less likely to be lost to the water environment. Funding (some £2m in the current SRDP) has been allocated for moorland management; grazing plans should limit the risk of erosion resulting from over-grazing. Smaller sums have been allocated for peatland restoration, such as peat dams and grip-blocking.

<u>Research and Other Tools</u>

PLANET. The Scottish Government has funded the development and promotion of a Scottish PLANET[1] (Planning Land Applications of Nutrients for Efficiency and the environmenT) decision support system at a cost of over £300,000 to assist farmers with nutrient planning and management. This is being kept up to date.

Centres of Expertise[2]

Centres of Expertise were set up in 2011 to bring together experts from the publicly funded research sector, including universities, to provide rapid, accessible and integrated scientific information and advice for important policy areas. ClimateXChange (CXC) has advised Scottish Government on the climate change abatement potential of restored peatlands. The Centre of Expertise for Waters (CREW) has dealt with a number of areas relating to soil management, especially for water quality and diffuse pollution mitigation.

Strategic Research Portfolio

In the 2011-16 funding cycle of the Scottish Government's strategic research portfolio (funded by RESAS, the Rural and Environment Science & Analytical Services division), long-term soils research continues to be supported through the Environmental Change Programme. Most soils research is carried out under the Ecosystem Services and Land Use Themes, with research into relationships to water quality and renewables taking place in the Water and Renewable Energy Theme.

A major focus of the soils research is to improve the evidence base for estimating GHG emissions from Scottish soils and vegetation under changing land use. Significant research outputs since 2009 include:

- Improved methods for estimating net GHG emissions from the agricultural sector, taking account of reduced emissions from cropland conversion since 1990
- Improved evidence on how compaction by animals and machinery, tillage and land use change affect soil structure and associated GHG emissions
- An assessment of the amount of carbon that Scotland's cultivated topsoils could potentially store, gain and lose
- Resampling of the National Soils Inventory for Scotland, with results suggesting that soil carbon stocks have not declined during the last 25 years
- Further development of the 'Land Capability for Agriculture' classification system to help planners, policymakers and land managers identify risks and opportunities from the changing climate
- Identifying how physical and biological soil properties contribute to soil resilience, to help improve how soil quality is measured.

Tools of relevance to farmers, land managers and the public include:

[1] see *http://www.planet4farmers.co.uk/*

[2] See http://www.scotland.gov.uk/Topics/Research/About/EBAR/StrategicResearch/future-research-strategy/CoE

- SOCiT – An app to help farmers, land managers and other users estimate the carbon content of soil[3]
- Soil Information for Scottish Soils (SIFSS) - An app which uses GPS and other geographical data for users to find out the soil types in their area and explore the characteristics of some 600 different soils
- Visual Evaluation of Soil Structure (VESS) - a simple spade test that describes soil structure semi-quantitatively by use of a colour guide.

In addition, maintenance of the National Soils Archive and the Scottish Soil Database (held by the James Hutton Institute) continues to be funded as part of the 'Underpinning Capacity' component of the 2011-16 portfolio.

SEWeb – soils database/monitoring.
The Soil Monitoring Group, reporting to the Soil Focus Group, has advised on the contents of a Soils Monitoring Action Plan (MAP) for Scottish soils. From December 2013, the 'Scotland's Soils' database and website will provide public access to information on Scottish soils and to a range of spatial (GIS) datasets. The site will form a 'daughter website' of the 'Scotland's Environment' family of websites.

Public bodies

SEPA. The State of Scotland's Soil report (2011) was led by SEPA in collaboration with Hutton and SNH, with contributions from a range of other organisations including SAC (now SRUC), BGS, CEH and FCS.

SEPA has also co-ordinated a Position Statement on Planning and Soils to raise awareness and clarify the soil related issues they will advise upon when undertaking their planning function.

SNH. SNH's research-related activities include the development of indicators and tools to monitor soil quality and threats to soils. In collaboration with JNCC, work has been undertaken on greenhouse gas balance in peatlands. Other research has improved understanding of the relationship between soil and habitat values, including mapping and accounting for soil ecosystem services, especially the role of soil carbon storage and sequestration. SNH have also contributed to raising awareness and access to soil information, producing a series of soil information notes for Local Authorities, and promoting citizen science e.g. for soil monitoring.

Further details of the work of Scottish Government, SEPA, SNH, the James Hutton Institute, Forestry Commission Scotland, Scotland's Rural College (SRUC) and Scottish Water are given in Annex 1, which summarises progress made in relation to the 39 Actions of the Scottish Soil Framework

Scottish Government
6 December 2013

[3] See https://play.google.com/store/apps/details?id=uk.ac.hutton.SOCiT

ANNEX 1

SCOTTISH SOIL FRAMEWORK REVIEW: Summary of progress in relation to Actions

ACTION	Main Points
1. Establishment of Soil Focus Group	The Soil Focus Group (SFG) was set up to advise on soils policy and on the development of the Scottish Soil Framework. It has been the steering group for the State of Scotland's Soil report and for the Soil MAP work.
2. Awareness raising in policy development	Soil management is now supported by a Position Statement on Planning and Soils, produced by SEPA in consultation with other public bodies, to raise awareness and clarify soil-related issues. SEPA will advise on soils when consulted on planning matters.
3. Five-year review of the Framework	The SFG has reviewed individual actions of the SSF. This note is a summary of progress on the whole of the SSF.
4. Progress reports	Progress reports have been provided to update the SFG and/or individual stakeholders, but not systematically. Examples are the State of Scotland's Soil Report, Socioeconomic Data on Scottish Soils, and the Soil Monitoring Action Plan.
5. State of Scotland's Soil report 2011	The State of Scotland's Soil report, its development led by SEPA, was published as a Natural Scotland paper in March 2011. Collation and publication of the report was managed by an Editorial Group consisting of SEPA, James Hutton Institute (Hutton) and SNH. Specific contributions were written by small groups of specialists from a range of organisations including BGS, CEH, FCS, IOM, Hutton, SRUC, SEPA, SNH, UK Biochar Research Centre (UKBRC) and the University of Glasgow. The report provides an assessment of the state of Scotland's soil resource, contributing to the wider understanding that soils are a vital part of our economy, environment and heritage, which need to be protected for present and future generations. It outlines the pressures on Scotland's soils, ranging from climate change to changes in land use and management, and considers the impacts these have on soil functions and the resulting environmental and socio-economic consequences. Opportunities for protecting and improving our soils are outlined. The State of Scotland's Soil Report has been summarised in the Soil Topic on Scotland's Environment Website and also provides the basis of the State of Soil text on the Scottish Soils website.
6. Conference on the outcomes of existing research programme	The Main Research Providers carried out knowledge exchange activities to promote the outcomes of the 2006-2011 RERAD Programme. The SG (RESAS) has reported on work packages relating to soils. The SG hosted a conference in February 2013 for the Scottish Soil Database and Website (SSDW) project.
7. Training on soil protection	SEPA has developed and provided training courses on soil protection to SEPA and SGRPID staff. In addition SEPA ran diffuse pollution courses which included awareness raising on soil protection. The British Society of Soil Scientists has developed the "Working with Soils" initiative. FCS is providing three years' funding to develop training and awareness material on delivering the UK Forestry Standard Soils Guidelines.

ACTION	Main Points
8. Raising the public awareness of soil	The SG, SEPA and SNH have overseen the development of the Scottish Soil Database and Website (SSDW), which should help raise the public's awareness of soil. Similarly, including soil as a topic on Scotland's Environment Website should help raise the profile of soil. There are also soil pages on SEPA's website. SEPA have published three articles in SEPA View relating to the importance of soils: Top Soil, Top Soil Part 2 and Soil Matters. SNH (with support from Hutton) presented the SSF at the BGS open day in 2010 and maintained a soil display the following year.
9. Information availability	The SG, SEPA, SNH and Hutton have taken part in the Steering Group, Editorial Group and User Group for the SSDW project. Information, primarily from the National Soil Database at Hutton, is being made available on Scotland's Soils website (funded through the RESAS Strategic Research Portfolio's Underpinning Capacity stream). SNH has developed thematic soil information on Soil carbon richness for planning advice (SNH information note 318, 2012), published as part of definition of natural heritage features. Revision of SNH guidance on windfarm strategic location using soil carbon richness criteria (consultation in 2013). SNH is developing a series of Soil and Earth Science Information Notes (SESIN) for targeted users (wider definition of soil as natural heritage features of national importance) and plans publication in 2014. SNH has integrated soil data and information in SNH's internal web system and produced internal guidance on how to use soil information. [Similar action by SEPA and FCS.] The Soil Information For Scottish Soils (SIFSS) webpage was made and released by the James Hutton Institute. This provides free access to Scottish soils information. The SIFSS smartphone app was subsequently released in 2012 to make soil information accessible in the field.
10. Scottish soil monitoring network	SEPA and SNH have commissioned reports on soil indicators, eg HP1108 (testing soil quality indicators, 2013). The Soil Monitoring Group (SEPA, SNH and Hutton), set up by the SFG, put forward the Soil MAP and an implementation plan. This is one of the first of the monitoring actions plans (MAPs) being developed in line with CAMERAS Environmental Monitoring Strategy, aiming to co-ordinate environmental monitoring across Scotland and make it more efficient and cost-effective. The Soil MAP recognises the need to develop a systematic, co-ordinated approach to soil monitoring in Scotland that will provide soil data and information for a wide range of policy, management and planning issues beyond soil protection per se.

ACTION	Main Points
	The design, novel methods applied and results from the resurvey of the National Soil Inventory, carried out by Hutton, have been used to inform the development of a soil monitoring programme for Scotland. SRUC and Hutton have also contributed to, and produced, a range of reports and publications on soil indicators for monitoring. A number of areas of existing work have been identified which could provide soil information, for example (on soil erosion) the SEPA diffuse pollution Priority Catchment work. SEPA are investigating if it is possible to use existing priority catchment data to obtain information on soil erosion and also if it is possible to collect relevant additional information in future. In parallel, the Ecosystem Health Indicators initiative is considering soil-derived indicators as part of the Scottish Biodiversity Strategy, led by SNH.
11. Common Agricultural Policy Health Check	SEPA, SNH and FCS provided input to the SG's CAP Stakeholder Group and CAP Workstreams and provided advice to the SG and CAP consultation responses on the need to ensure that CAP reform was integrated with soil protection needs. SEPA provided the SG with a briefing document on soil protection needs.
12. Scotland Rural Development Programme review	SEPA, SNH and FCS provided input to the SG's SRDP sub-groups and provided advice to the SG, with responses on the need to ensure that SRDP reform was better integrated with soil protection needs.
13. Revision of the PEPFAA Code	SEPA assisted the SG with the revision of the PEPFAA Code through the Scottish Agricultural Pollution Group. The Code is kept under review but has not been revised since before 2009. SNH has commissioned studies on peatland responses to fire (2011-13) and the ecosystem effects of long-term herbivore exclusion on soils (and vegetation) (started 2103).
14. Review Land Capability for Agriculture (LCA) Assessment	Hutton has carried out a Land Capability for Agriculture (LCA) Assessment of the potential impacts of climate change on farming, with an associated report and journal publications. A stakeholder workshop was held at Scottish Government to assess implications for different organisations and end-users and to aid in developing a fully digital LCA. In parallel, Hutton is working with the Scottish Government to assess how to implement area-based payments under CAP Reform, using LCA as a potential mechanism.
15. Use of land for development – data collection	The Scottish Government gathers a limited amount of data from planning authorities linked to their performance indicators and the categories of planning applications determined. Data is no longer collected on the area of agricultural land that is taken each year for development. However, there is interest, in the Land Use Strategy, in Ecosystem Health Indicators and in European Commission plans, in soil sealing. An assessment of soil sealing is an action in the Soil MAP.
16. Review of Sewage Sludge Directive	SEPA has provided advice on proposals for revision of the Sludge (Use in Agriculture) Regulations 1989 in collaboration with the SG on the Defra-led Sludge Use in Agriculture - Steering Group.

ACTION	Main Points
17. Review controls on Sewage Sludge for land restoration	SEPA developed and led a SNIFFER project which reviewed controls and produced a Code of Practice for the use of sludge, compost and other organic materials for land reclamation.
18. Support annual reporting of monitoring of organic material to soil regulated activities	SEPA have developed a risk-based soil compliance monitoring strategy for regulated activities that have an impact on soil. This includes sampling sites where exempt organic waste or sewage sludge have been applied, mainly for agricultural improvement purposes. Soil sampling began in 2007 and continues to the present day. Annual reports from 2008 to 2010 are available on the SEPA website. Data from 2011 and 2012 will be available soon as part of a wider report on the spreading of organic materials on land.
19. Ensure forestry good practice to promote sustainable soil management (SSM) remains fit for purpose	Forestry Commission Scotland took part in the review and consulted on the UK Forestry Standard and the supporting Guidelines. FCS has published in 2011 its policy position of a presumption against planting of trees where there is peat of 50cm or more depth. Guidance has also been prepared on re-stocking.
20. Review UK Forestry Standard and the supporting Guidelines	Forestry Commission Scotland consulted on the UK Forestry Standard and the supporting Guidelines. SEPA provided a response to the FCS consultation. The revised Forestry Standard was published in 2011.
21. Delivery of sustainable forest management	The UKFS continues to be implemented through forest regulatory and financial support mechanisms. FCS is working on initiatives to improve the long-term management of steep slopes, and improved access to information and support to deliver appropriate woodland creation for water and soil benefits.
22. Delivery of the Scottish Forestry Strategy 23. Stump harvesting guidance	Forestry Commission Scotland has worked with partners in delivering the actions of the Scottish Soil Framework and the annual Scottish Forestry Strategy plans to promote and deliver the sustainable management of soils. Interim guidance on stump harvesting was published in 2009.
24. Consider role of soils in flood risk management	SEPA has produced draft *"Guidance on identifying potential for natural flood management".* This includes the role of soil management and agricultural field drainage. SEPA has undertaken a national screening exercise to identify where there are opportunities for alteration or restoration of natural features to help manage flood risk, as required by Section 20 of the Flood Risk Management (FRM) Act. FCS co-funded this work to enable full consideration of woodland measures. SNH is also involved.
25. Formalise links between soil management and water protection measures	SEPA provided major assistance to the SG in the development of General Binding Rules in 2008 in respect of various land based activities (fertiliser storage and application, livestock activities etc), recognising links between soil management and water protection measures. SEPA were similarly involved in the GBR revisions in 2011. SEPA led the setting up of, and chairs, the Diffuse Pollution Management Advisory Group which developed Scotland's Rural Diffuse Pollution Plan (2010). This Plan includes identifying the links between soil management and water protection measures.

ACTION	Main Points
	SEPA have recorded diffuse pollution GBR non-compliance (including soil issues) by walking along 5000 km of watercourses. One-to-one farm visits and farm inspections were carried out in 14 priority catchments. SEPA visited 1,500 farms, including some in each catchment, and discussed with farmers ways of preventing the GBR breaches - these included soil protection measures. FCS has initiated a national project to opportunity map the 14 priority catchments in Scotland, to identify where woodland creation and improved management can help deliver better soil and water protection, amongst other benefits. Scottish Water have created a Sustainable Land Management Team. The team aims to improving drinking water quality by looking for contaminants of water sources through catchment surveys, awareness raising and liaison with land managers. The Scottish Water Sustainable Land Management Incentive Scheme was launched in April 2012 for six priority catchments. This provides financial assistance for land managers to implement measures that will reduce the risk of diffuse pollution. It will also help improve soil management and soil protection.
26. Soils within designated sites	SNH has published "Climate Change and the Natural Heritage: SNH's approach and action plan" (July 2009) and "Climate change and nature in Scotland" (2012), promoting land management practices that reduce carbon loss and increase the amount of carbon stored in vegetation and soils.
27. Peat protection	SNH, SEPA and FCS contributed strongly to the Scottish Government discussion paper on Management of carbon rich soils (2010). SNH, SEPA, Hutton and FCS continue to advise the SG and other stakeholders on peat protection through their roles on the following groups: Scottish Government's Peatlands Policy Group, 2020 Land Use and Forestry Group, and the Peatland Working Group convened by the Moorland Forum. SNH has commissioned research by Hutton on the scope for blanket bog peatland restoration, both for the carbon benefits and for biodiversity. The report is due to be published in late 2013. Hutton has also produced a report on lowland raised bog restoration, commissioned by the Scottish Wildlife Trust SEPA and SNH provided input to the Updated Peat Survey Guidance, and are involved in the Peatland Plan. SEPA have responsibility for over-seeing the carbon calculator outputs for Section 36 wind farm applications on peatland. Developers of smaller wind farms on peatland are also expected to apply the carbon calculator to assess the carbon effects of the wind farm. SNH and SEPA took part in the JNCC-commissioned work on peatlands with particular reference to carbon fluxes, eg JNCC Reports 442, 443 and 445. Hutton co-authored 442 and 443. SNH commissioned report 701, the Scottish only revision and update of JNCC report 445 (Towards an assessment of the state of UK peatlands (2011): used as the IUCN peatland technical report.

ACTION	Main Points
	SEPA, SNH and FCS also provided evidence to the Rural Affairs, Climate Change and Environment (RACCE) Committee meeting on the benefits of peatland restoration. SG announced in October 2012 £1.7m for peatland restoration in 2012-15 as a Green Stimulus initiative. The programme has been managed by SNH. In the second Report on Policies and Priorities (RPP2, 2013) the SG has proposed that 21,000 ha of peatlands per year should be restored in the period to 2027. In September 2013 the SG announced £5m for peatland restoration in 2014-15 and a further £10m in 2015-16. A national Peatland Plan is being prepared. FCS work to develop guidance on future options for managing deep peat clearfell sites includes a method to assess when peatland restoration is the best option. Estimates developed to measure the impact of this guidance indicate that between 45,000 and 90,000 hectares will be suitable for conversion from productive forest to peatland. The Scottish Water Sustainable Land Management Incentive Scheme contains peatland restoration options, available in three of the six priority catchments. Scottish Water have identified drinking water catchments where degrading peat may pose a risk to water treatment processes and drinking water quality. Hutton is developing a peatland restoration decision support tool (WISE Peatland Choices) under the Scottish Government's ClimateXChange (CxC) Centre of Expertise. A first version of this was presented at a peatland restoration workshop in October 2013. Hutton also provided policy statements on the emissions abatement potential from peatland restoration under CxC call down requests. SNIFFER ER18: Assessment of the contribution of aquatic carbon fluxes to carbon losses from UK peatlands (Hutton).
28. Soils as part of broader geodiversity management	The *Geodiversity Charter for Scotland*, based on the output of reports prepared by the British Geological Survey and SNH on the links between Geodiversity and Biodiversity, was published in 2012. SEPA provided input to the consultation on the Geodiversity Charter, highlighting the need to consider soils better within the Charter. SNH published in 2012 Biodiversity and Geodiversity: Considerations in Strategic Environmental Assessment.
29. Review of policies to prevent acidification & eutrophication	The Scottish Government has contributed to the review which led to a revised National Emissions Ceilings Directive and associated Protocols on air pollution (eg ammonia) that affects soils. SEPA and SNH soils staff work closely with air and ecology staff and have run two research projects relating to the impact of atmospheric deposition: eg HP801 to establish soil quality indicators to assess the impact of atmospheric deposition on environmentally sensitive areas (2010). See also Action 10.

ACTION	Main Points
	FCS has worked with partners across GB to create guidance on managing forests in acidified catchments, and has initiated a project with SEPA to draw up a protocol to deliver this guidance in Scotland.
30. State of Contaminated Land Report	SEPA wrote and published a State of Contaminated Land Report in 2009: Dealing with land contamination in Scotland: A review of progress 2000-2008. A summary document is also available.
31. Specific and general historic environment guidance review	Archaeological sites, including their soils, can be protected through scheduling by Historic Scotland. The historic environment sector already has a strong awareness of the potential of soils as sources of information. Stirling University / Historic Scotland Research Workshop on Earth-built Heritage (2013) – consideration on soils and clay material resources of Scotland; http://conservation.historic-scotland.gov.uk/home/future-events/past-events/earth-structures-workshop.htm.
32. Active participation in Soils Framework Directive negotiations	The SG has liaised with DEFRA and other UK Administrations over discussions on the Soils Framework Directive proposal; the UK is part of a blocking Minority with Germany and France. SEPA was appointed in 2011-12 an expert to the EU Committee of the Regions (CoR) to help their Rapporteur prepare a CoR Opinion Paper on the EC Implementation of the Soil Thematic Strategy. SEPA has taken part in meetings with CoR members, CoSLA, EC officials (DG-Env), regional and local government, SG, DEFRA and other stakeholders. The CoR opinion has now been published in the Official Journal of the European Union.
33. Enhance knowledge on carbon dynamics in soils	SEPA, SNH and FC were involved in the steering group for both the ECOSSE and the ECOSSE 2 projects, which assessed the quantity of carbon in Scotland's peat: 1,600 million tonnes out of a soils total of 3,000 Mt. FCS has been part of the on-going work of the ECOSSE project, in which Forest Research is a key partner. SNH/SEPA is funding PhD studentships, eg on Quantifying the impact of wind farm development on peatlands for aquatic carbon and nutrient fluxes (Universities of Glasgow and of Edinburgh).
34. Identify soil management practices that optimise soil carbon sequestration	The SG, with advice from SRUC, is leading on the "Farming for a Better Climate" programme, a communications strategy encouraging farmers to adopt efficiency measures that reduce GHG emissions. SEPA and SNH provided detailed comments. ClimateXChange held a workshop on carbon sequestration in grassland on 7 November 2013. FCS has commissioned substantial research on carbon sequestration in forestry, and subsequently has drafted guidance on future options for managing deep peat clearfell sites. Two major studies (Hutton and SRUC) indicate that carbon stocks in Scottish soils have not declined over the last 25 years and have increased under Forestry. Current work has also shown that Scottish cultivated topsoils could store considerably more carbon. Long term experimental studies have identified controlling properties on GHG emissions from agriculture, with land drainage being among the most critical.

ACTION	Main Points
	A Soil Carbon app for smart phones in partnership with Quality Meat Scotland allows farmers to obtain an assessment of soil carbon levels in their fields. Hutton are currently investigating carbon dynamics which complements the development of the WISE model, a scoping tool for the prioritisation of restoration needs of peatland in Scotland. Recently an improved estimate of emissions from the agricultural sector has been prepared by aggregating emissions across different sectors of the inventory.
35. SNH guidance on soil carbon in peatlands	SNH has published guidance on soil sampling in relation to peatlands, including peat depth, vegetation and water table monitoring. SNH Peatland audit: internal audit to delineate peatland soil and habitats (on-going). This links to studies by JHI and to the protection of designated areas, including peat extraction sites. Soil/soil carbon identified as natural assets in Natural Capital asset index for Scotland.
	[Actions 36-39]
36. Forest Carbon Standard and Climate Change guidelines	The UK Forestry Standard continues to be implemented through forest regulatory and financial support mechanisms.
37. Forest carbon review 38. Climate Change Action Plan	The Forests and Soils Guidelines (2011) are one of the associated guidelines to support the UK Forestry Standard (Forestry Commission, 2011). There are also Forests and Climate Change guidelines (2011) which support the UKFS, and a FCS Climate Change programme (2013).
39. Sustainable Forest Management	The UKFS continues to be implemented through forest regulatory and financial support mechanisms.

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