

Consultation Response

The Scottish Soil Framework: a consultation document, June 2008

The following organisations are signed up to this response¹:

Buglife Scotland
Friends of the Earth Scotland
John Muir Trust
National Trust for Scotland
RSPB Scotland
Scottish Wildlife Trust
Woodland Trust Scotland
WWF Scotland

About Scottish Environment LINK

1. Established in 1987, Scottish Environment LINK is the forum for Scotland's voluntary environment organisations - 31 member bodies representing a broad spectrum of environmental interests with the common goal of contributing to a more environmentally sustainable society. LINK provides a forum and network for its member organisations, enabling informed debate, and assisting co-operation within the voluntary environmental sector. LINK assists communication between member bodies, government and its agencies and other sectors within civic society. Acting at local, national and international levels, LINK aims to ensure that the environment is fully recognised in the development of policy and legislation affecting Scotland. LINK is a Scottish charity and a company limited by guarantee working to its [Memorandum and Articles of Association](#) (revised November 2006) and its [Operating Principles](#) (revised December 2006).

Main points of LINK's response

2. LINK welcomes and supports the development of a Scottish Soils Framework and is in broad agreement with the vision, aims and outcomes as proposed. However, LINK has a number of suggestions which we believe will strengthen the document still further. We believe that by widely promoting the importance of soils², and delivering increased protection and management for Scotland's soil resource, we will secure

¹ We would respectfully request that those organisation not submitting a separate response be treated as separate respondees when compiling numbers of respondents for the analysis of consultation responses.

² Key audiences who are currently often not aware of soil issues include planners, landscape architects, architects, developers and engineers.

valuable socio-economic and environmental benefits in both rural and urban areas. We urge the Scottish Government to be ambitious in its efforts to secure these benefits from sustainably managed soils in the light of severe pressures from climate change in the coming decades.

3. LINK has 12 major comments on the framework which are set out in paragraphs 4 to 18 below. We then go on to briefly answer the questions posed in the consultation document.

Lack of indicators, targets and resource allocation

4. LINK's biggest concern is that the laudable outcomes listed in framework are not supported by **baseline data, indicators** and, where appropriate, **targets**. Without a mechanism to effectively monitor progress towards the outcomes, the framework will lack the teeth needed to make a real difference to the protection and enhancement of Scotland's soil resource. Crucially, once **soil health indicators** and targets have been attached to each of the outcomes listed in figure 7.1, adequate **resources** must be allocated by the Scottish Government to ensure that the outcomes are then delivered on the ground through **management techniques** linked to each of the outcomes. The Scottish Government should also explore and take advantage of new mechanisms for funding soil conservation e.g. revenues from offsetting schemes funding peatland restoration.

Soil health

5. LINK does not agree with the wholly unsubstantiated statement in the framework that 'Scotland's soils are in generally good health'. Historic deforestation, urban development, decades of pesticide and fertilizer use, overgrazing, poaching and compaction in the uplands, drainage of wetlands (including blanket bogs on a vast scale) and unsustainable methods of muirburn have all had **profound and irreversible impacts on soil structure, chemistry and biodiversity** (above and below ground). Quite apart from historic degradation of soils, SEPA estimates that around 780,000 tonnes of soil is lost every year from agricultural areas along with 45,000 tonnes of nitrate and 2,800 tonnes of phosphate which has implications for water quality and wider ecosystem health³. N and P enrichment arising from soils into aquatic systems remain one of the main causes of failure to achieve Water Framework Directive objectives, and currently only voluntary measures exist to address this issue.

A reluctance to introduce or improve Regulations to protect Scotland's soil resource

6. There is a reluctance in the framework to explore the need for new or improved **Regulations** to better protect Scotland's soil resource - presumably so as not to place further (perceived) regulatory burdens on businesses, land owners/managers and farmers. LINK believes this may be a mistake given the increasingly severe pressure on soils from climate change and the likelihood that a "business as usual" approach is unlikely to secure the health of Scotland's soil resource. LINK therefore recommends that the Scottish Government explore more fully the need for new or

³ SPICe Briefing 06/53: Soil protection in Scotland. The Scottish Parliament.

improved Regulations. We also urge the Scottish Government to lend its *full support* to efforts from the European Commission and Parliament to introduce a robust Soils Framework Directive, including urging the UK Government to support revised proposals for a Directive⁴.

Soils Information System

- LINK recommends that an immediate priority for the framework should be to set up a mechanism to enable monitoring of progress towards the stated outcomes – a **Scotland Soils Information System (SSIS)** similar to the type of system developed by the Norwegian Institute for Land Inventory⁵ for Norway. A set of selected **soil health indicators** (linked to the framework outcomes) should be a key output from the SSIS which should be published annually as part of the Key Scottish Environment Statistics. The starting point for the SSIS and subsequent indicators and targets should be the datasets held by The Macaulay Institute and others as listed in Towers et al (2006)⁶.

Action on climate change threats

- LINK feels that although **climate change** and **loss of soil organic matter** are flagged up in the framework as the most significant threats, there is insufficient detail on how the Scottish Government proposes to tackle these potentially catastrophic threats. In particular, the potential loss of carbon from increased **erosion of upland peat soils** is likely to require considerably more action and innovative policy solutions beyond simply amending SRDP measures. Loss of peatland soils, for which Scotland holds an internationally important resource, would also mean Scotland would fail to deliver its biodiversity action plan (BAP) targets on peatland protection and restoration. These might include ambitious programmes for blanket bog restoration and protection, more efforts to reduce deer numbers, strategically located native woodland creation/restoration (avoiding deep peats), encouraging less intensive and more sustainable management of upland sporting estates (particularly burning practices). The framework should cross reference targets and objectives, particularly for blanket bog, under the UKBAP and the Scottish Biodiversity Strategy (see <http://www.ukbap.org.uk/UKPlans.aspx?ID=21>)
- Agricultural practices also need to change to mitigate carbon losses from soils through practical measures that **minimize soil expose** and **reduce tillage**. Bare cultivated soil is prone to erosion and nutrient leaching and well timed cultivations and use of `catch` and `cover` crops should be used to limit extended periods of bare soil. This should also have synergistic benefits for biodiversity and water quality from over-wintering stubbles and green manures. Field operations, especially ploughing also disturbs soil organic carbon. Avoiding such disturbance through reduced tillage techniques should reduce GHG emissions.
- LINK is also concerned that there is no mention in the framework of the risk to **soils in the coastal zone** from the impacts of climate change. Many of these, such as the machair soils of the Western Isles are of national or international significance.

⁴ The UK was one of only five nations which voted against adoption of the Directive at the December 2007 Environment Council.

⁵ See <http://www.nijos.no/jord/>

⁶ Towers, W et al (2006) Scotland's soil resource: current state and threats. Macaulay Institute and University of Stirling.

Soil sealing and soil loss

11. LINK feels that the extent and threats arising from **soil sealing** and **soil loss** has been significantly underplayed in the framework. Soil sealing as a result of development is a particular issue⁷ which is leading to the erosion of prime agricultural land and semi-natural habitats which provide valuable ecosystem goods and services (flood alleviation, biodiversity, food production, areas for recreation etc.). Data on soil sealing and loss should be collected and published annually by the Scottish Government as one of a number of **soil health indicators** linked to the outcomes of the framework.

Soil biodiversity

12. LINK agrees that 'soils are a reservoir of huge biological diversity' and would urge the Scottish Government to continue to invest in a programme of **soil biodiversity** research, particularly in relation to the functional role of soil biodiversity, the impacts on biodiversity of pesticide, herbicide and fertilizer use, and the development of **biological indicators** which could in future be used to assess the **ecological condition** of soils.
13. Currently, land cannot be designated for nature conservation purposes on the basis on soil alone. LINK feels this is a major anomaly and recommends that once the SSIS is in place, and we have gained a better understanding of the below ground biodiversity value, rarity and ecological condition of certain soils, then consideration should be given to **designating the best examples as SSSIs**.

Urban soils

14. LINK feels there is a bias towards rural and agricultural (and we would add *horticultural*) soils within the framework. **Urban soils**, including gardens, allotments and greenspaces, are a very important resource which support biodiversity, ameliorate flooding, improve water quality and provide a medium with which people can engage directly with the natural world (including activities such as education, recreation, nature study and gardening, particularly organic and wildlife gardening). Urban soils also contain significant archaeological deposits detailing our development as a society. The protection and good stewardship of urban soils should therefore be promoted more explicitly in the framework – particularly the role of soils in Sustainable Urban Drainage Schemes and in helping the urban environment adapt to climate change.

Organic farming

15. Organic farming is not mentioned anywhere in the framework document yet its benefits in enhancing the quality of agricultural soils are well known. LINK would like to see explicit recognition of the positive **role of organic farming in soil conservation** and a commitment to continue to support and promote organic production methods into the future.

⁷ An area of 1,400 hectares, approximately the size of Dunfermline is lost to development every year SPICe Briefing 06/53: Soil protection in Scotland. The Scottish Parliament.

Governance, implementation and reporting

16. It is not clear in the consultation document who will be responsible for **implementing and monitoring progress** with the framework. LINK suggests that this should be the responsibility of one Minister, supported by a civil servant with a specific remit to deliver the outcomes of the strategy by coordinating action and reporting across departments, statutory agencies and research institutes. Without Ministerial 'ownership' of and coordination from central Government, the framework is unlikely to have any effect on the current disjointed approach to research and action on soils. Soils are too important an issue to be left with a flexible and informal approach and implementation of the framework will require leadership and a strong commitment to deliver.
17. LINK also feels that although there are soil protection policies in existence, many of these are **not implemented and monitored** effectively. For example, it is widely acknowledged that measures under Good Agricultural and Environmental Condition are not monitored in any meaningful way, and farmers have never been penalized for unsustainable soil practices. Similarly, the consideration of soils under Environmental Impact Assessment (Scotland) Regulations 1999 and Planning regulations is usually cursory at best and these regulations have failed to address the threats from soil sealing, erosion and contamination. The framework should ensure these and other relevant regulations and financial mechanisms work better to ensure soil protection and enhancement.

Palaeosols and geodiversity

18. The framework does not adequately address the physical characteristics and importance of **palaeosols and geodiversity** in protecting certain categories of soil. Many soils are of geodiversity interest because of the constituent minerals from which they are composed or because they have experienced particular climatic or other physical processes. This category includes periglacial and solifluction deposits as well as lacustrine and marine deposits. Many of these contain valuable palaeo-environmental information vital for studying our past climatic and environmental history. Identification and protection of such deposits has been imperfectly carried out in the past and research is needed to the nature, extent and significance of these soils and of the measures needed to protect them.

Cultural Heritage

19. Also not addressed in this framework and closely allied to palaeosols, is the importance of soils not just as mediums for containing archaeological remains but as intrinsic to maintaining the quality of **archaeological information**. Archaeological soils can be degraded in the quality of information they provide both by physical degradation and bioturbation. Both of these can be accelerated by chemical impacts (such as pesticides, fertilisers and from pollution such as acid rain) and external impacts like drainage (causing the degradation of organic remains preserved in anerobic conditions). The framework should identify processes for researching these impacts and a methodology to identify key archaeological soils and the management needed to maintain them in optimum condition. This may well be allied to processes to protect other soils such as peats and palaeosols.

Response to specific questions proposed in the Framework

Question 1. The Government is proposing the Scottish Soils Framework in order to provide a policy overview and a coordinating vision for future actions on soil protection. Do you agree this is desirable?

Yes with caveats. Looking at soils policy in a strategic, holistic way is the most effective way of ensuring we protect and enhance Scotland's soil resource for future generations. If the proposed Soils Framework is developed as a practical and coordinated series of actions to acquire better knowledge, raise awareness and stimulate action, then we are supportive. The Framework must make a contribution *in its own right* and provide a strong steer for coordinated activity, and not merely be a record of activity that is already taking place.

We would stress the necessity to integrate the identified areas of concern and the stated outcomes. Despite recognition of policy integration as one of four work areas it is of critical importance that integration is achieved throughout all elements of the framework's structure.

The draft framework is light on detail, ambition and targets. If the framework is to be effective then wherever possible it must refer to baselines and contribute to measured outcome delivery (see paragraph 4 above). However lack of detailed knowledge in some areas should not be used as an excuse for inaction. Knowledge of soil function is good enough in all areas to take forward a wide range of activities.

Question 2. Do you agree that the distinct Scottish soil resource requires protection?

Yes, Scotland contains a high proportion of relatively undisturbed semi-natural and natural soils which require special consideration. Of particular importance are the many rare montane soils, extensive tracts of internationally important peatlands and the machair soils of the west coast. Locally distinctive soils are the basis on which our foods grow and a factor in determining the local diet.

Question 3. Do you agree with the analysis of the main soil functions presented here?

Yes, to an extent but in order to reinforce the linkages between the various soil functions we suggest adoption of the concept of 'soil health'. The underlying principle in the use of this term is that soil is not just a growing medium, rather it is a living, dynamic and slowly changing environment.

A healthy soil is one that is:

- In a state of composite well-being in terms of biological, chemical and physical properties;
- Not degraded, nor degrading, nor causing negative off-site impacts;

- With each of its qualities cooperatively functioning such that the soil reaches its full potential and resists degradation;
- Providing a full range of functions (especially nutrient, carbon and water cycling) and in such a way that it maintains this capacity into the future.

Different soils will have different benchmarks of health depending on the 'inherited' qualities, and on the geographic circumstance of the soil. The generic aspects defining a healthy soil can be considered as follows:

- The capability for biological productivity is broad.
- The soil biology is diverse;
- Absorbency, storing, recycling and processing is high in relation to limits set by climate;
- Water runoff quality is of high standard;
- There is low entropy;
- And there is no damage to, or loss of the fundamental components.

This in practical terms means that;

- There is a comprehensive cover of vegetation;
- Carbon levels are relatively close to the limits set by soil type and climate;
- There is very little leakage of nutrients from the ecosystem;
- Biological productivity is relatively close to the limits set by the soil environment and climate;
- Erosion proceeds only at geological rates;
- There is no accumulation of contaminants; and,
- The ecosystem does not rely excessively on inputs of fossil energy

We would also like to suggest the following specific additions to this section:

- Although it is true that many soils are a finite non-renewable resource it should be recognized that soil creation is an on-going geological and biological process and agriculture and gardening should work on a virtuous circle whereby the cultivatable soil and humus is constantly replenished. In addition appropriate planting and composting can sustain soils.
- The *horticultural* (in addition to agriculture and forestry industries) is a key part of a sustainable rural economy.
- Scottish gardens (private, heritage and botanic) and their managed soils also underpin Scotland's tourism industry.
- Cultural heritage is far more than archaeological remains. Our soil is an intrinsic part of our culture – it determines the vegetation and the entire ecological community of which man is an integral part.

There is ample knowledge on how to maintain and enhance soil organic matter in agricultural soils. Whilst further research is of course always required there is no reason why recycling of organic matter in soils through manure, compost and humus management, cannot be enhanced. The principles of organic farming should be examined and the relevant techniques adopted for wider use in agriculture and horticulture. Such as:

- greater reliance for crop nutrition on the maintenance of inherent soil fertility (the organic nutrient cycle) than the use of inorganic fertilisers
- regular addition of organic matter to the soil, especially composts
- non exploitation of soil nutrient content by the avoidance of intensive cropping or grazing of land.

Question 4. Do you agree with our analysis of soils in the context of climate change?

This chapter contains a useful summary of the potential impacts and interactions of climate change on soils. However there is a need for considerably more detail on the urgent and immediate need to manage soils in order to make a significant contribution to climate change mitigation. Land use practices can and must change to limit carbon dioxide and nitrous oxide emissions. LINK feels that the framework as it currently stands will fail to tackle with enough urgency the threat of climate change – particularly loss and degradation of peatland soils and organic matter, and the impacts of rising sea levels on coastal soils.

Question 5. Do you agree with the analysis of the pressures and threats faced by Scottish soils? If not, which other threats need to be considered?

No, see paragraph 8 above. We also find the ranking unhelpful and misleading in that some of these threats will be more severe in different regions and when acting in combination. We would prefer to emphasize the linkages between all risks. For, example soil erosion and soil organic matter are not separate subjects. Erosion is simply the final stage of the degradation of soil quality which is a function of organic matter and soil biological activity. Practices that reduce water and wind movement at the soil surface are good additional practices but unless the basic health of the soil is addressed, soil will remain prone to erosion. To mitigate and adapt to climate change we all have to do everything possible and then that bit extra. The combination of climate change and unsustainable management practices is the biggest threat our soils have ever faced.

Question 6. Do you agree with our analysis of the current role of soils in existing policy framework?

Chapter 6 provides a useful summary of existing soil protection mechanisms but fails to analyse whether these are effective, or being implemented or monitored adequately. Given that the threats listed in Chapter 5 appear to be increasing rather than decreasing, LINK believes that the uncoordinated package of existing policies is not working, and is likely to be completely ineffective when climate change impacts start to exacerbate existing threats. We would therefore support an over arching statutory mechanism (such as that proposed under the Soils Framework Directive) to ensure more comprehensive action on soil protection *and* enhancement.

Question 7. Where do significant gaps in soil protection exist?

The major issues here are under-implementation of existing regulations and the lack of a powerful statutory duty on soil protection. In particular, we would highlight:

- the lack of robust policies/legislation to prevent the degradation of upland and lowland peatland soils;
- lack of policies/legislation to protect against nutrient overloading of soils;
- the failure of the planning system to prevent unnecessary and uncontrolled soil sealing;
- the failure of water and flooding policies/legislation to prevent loss of wetlands and deliver sustainable catchment management;

- lack of statutory legal instruments to limit greenhouse gas emissions from agricultural practices;
- weak regulatory standards and practices to protect soils from excessive or inappropriate incorporation of sewage sludge or other contaminated organic wastes;
- exclusion of horticulture and gardening sectors.

As acknowledged in paragraph 6.6, there is limited coordination between soil protection measures and policies. A priority task when implementing the framework must therefore be to analyse the present situation and ensure that gaps are identified and filled. A coherent set of legal instruments is required to enforce measures that are necessary but not undertaken voluntarily. Soil protection must be enshrined in provisions relating to permissible emission levels, protection of water resources, on the possible impacts of genetic engineering and regulations pertaining to specific soil usage (i.e. agriculture and construction).

Question 8. What are your views on the impact of climate change on the effectiveness of the existing soil protection policy framework?

Climate change will have fundamental and potentially catastrophic impacts on Scotland's soils which the existing soil protection policy framework is woefully ill equipped to mitigate against. LINK believes there is an urgent need to put in place ambitious and extensive 'ecosystem health restoration programmes' throughout Scotland's terrestrial ecosystems, within which soil conservation – for both climate change adaptation and mitigation - should be a top priority. Without this we are likely to see huge losses of carbon from our peatlands⁸ which will lead to a breakdown in ecosystem functioning and compromise Scotland's proposed target under the Climate Change Bill to reduce carbon emissions by 80% by 2050.

In the lowlands, increased carbon flux rates with increased temperatures will require different management techniques and cropping regimes.

Question 9. Views are invited on the vision and aim.

The aim suggests that sustainable management of soils is fine unless it somehow compromises other objectives inconsistent with that management! We feel it does not adequately express the truth that soils are the basis for a strong economy, a cohesive society and a healthy environment. Soils, as core component of the environment around us are the foundation on which we build economic and social success. We feel the aim should be reworded to capture this important point.

Question 10. Views are invited on the outcomes, to which specific activities contribute to. Should we be adding additional outcomes?

LINK feels the outcomes are a good basis from which to develop a programme of measures and indicators (subject to the small but important text changes suggested below). Some of the outcomes already have baseline data (much of this information is held by The Macaulay Institute) from which indicators could be developed. These include for example:

- data on soil organic matter stock (Outcome 1);

⁸ Bellamy et al (2005) Carbon losses from all soils across England and Wales 1978-2003. Nature 437: 245-248.

- data on erosion risk which could be developed into real data on actual erosion in different regions (Outcome 2);
- Land Cover of Scotland (LCS88) data recorded extent of eroded blanket bog (Outcome 2);
- some data on soil sealing and loss which needs updating (Outcome 10)
- data on levels/impacts of deer and sheep grazing (Outcome 4);
- data from 180 sample sites on soil biodiversity which could form the basis for developing a more comprehensive picture of soil biodiversity (Outcome 5);
- Water Framework Directive data on suspended sediments (Outcome 1 and 2).

These are just some examples of the datasets which exist. Towers et al (2006) details all the current data sets which might be developed into baselines and indicators to back up the framework outcomes. LINK recommends that The Macaulay Institute is tasked to do this work as a matter of priority.

We have the following specific text suggestions on the outcomes which are probably the most important sentences in the whole framework (underlined).

1. Soil organic matter and structure protected and enhanced.
2. Soil erosion eliminated except where unavoidable.
3. Greenhouse gas emissions from soils reduced to optimum levels.
4. Soil's capacity to adapt to changing climate enhanced.
5. Soil biodiversity as well as above ground biodiversity researched and protected.
6. Soils making a positive contribution to sustainable flood management
7. Soils contributing to enhanced water quality through improved management.
8. Soil fertility maintained and enhanced.
9. Soil contamination eliminated
10. Soil sealing through development substantially reduced by planning strictures and in particular use of brownfield sites.
11. Effective coordination of all stakeholders through co-ordination of individuals' and organisations' roles, responsibilities and actions.

Question 11. Views are invited on the four work areas under which future activities will be carried out.

LINK broadly supports the four work areas but would like to see them ordered and subdivided as follows to ensure that all priorities areas are systematically cross referenced.

1. Research
 - a. Knowledge gap assessment
 - b. Knowledge gathering
 - c. Research coordination
 - d. Feedback
2. Monitoring
 - a. Development of robust baseline data
 - b. Trend evaluation
 - c. Development and communication of new indicators
3. Information
 - a. Education
 - b. Information provision
 - c. Awareness raising
4. Policy Formulation

- a. Voluntary initiatives
- b. Economic incentives
- c. Regulatory review and advice
- d. EU, UK and Scottish policy obligations integration

Question 12. Have the right activities been identified to contribute to achieving the outcomes?

No, not entirely and the approach is still too ad hoc and uncoordinated. See paragraphs 4 to 13 above. There should also be an overarching activity for 'the Scottish Government to ensure that all relevant policies will positively contribute to the vision and aims of the Scottish Soils Framework.'

Question 13. Are additional activities required?

See paragraphs 4 to 13 above.

Question 14. Which activities need to be prioritised?

See paragraphs 4 to 13 above.

Question 15. What are your views on future stakeholder engagement?

LINK supports the proposal to have continued stakeholder engagement. However given the importance of the soils framework there must be a much more robust and formal structure both to ensure delivery of the vision and aims and to ensure continued stakeholder interest and commitment.

We suggest the following commitment:

"The delivery of the vision and aims of the Scottish Soil Framework depends on the co-operation of all relevant key players in this area. We will therefore establish a Soils Framework Advisory Group that will have a remit to oversee all activities proscribed under the Framework. The group will have a responsibility to advise the Scottish Government and the Minister with responsibility for soils. The group will ensure that all actions undertaken in Scotland that impact on soils are consistent with the EU Soils Framework Directive."

This group along with the Soils Consultative Group, statutory bodies and Scottish Government will help to deliver activities under the work areas. The new group should provide a level of scrutiny over these activities. The work areas should cover the following categorisation which seeks to cover the main issues.

- Climate change
- Soil biodiversity and linkages with above ground biology
- Soil organic matter content
- Peat and high organic matter soils
- Soil nutrient and mineral content
- Water quality and flooding
- Recycling of organic materials
- Pollution and contamination
- Erosion and compaction

- Planning and soil sealing
- Cultural heritage
- Gardening and horticultural skills

We would suggest that the recommendations of Sub-groups that reported to the Soil Strategy Board be taken forward as the basis for further activity. We would like to see the work areas structured to work to baselines and outcomes where possible. Where suitable baseline databases do not exist then a priority should be to establish appropriate databases.

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