# Reviewing & Refining an Ecological Coherence Protocol using the Inner Forth Habitat Network Pilot & CSGN B-Lines



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# 1.  Introduction

## 1.1 The need to review and refine the Ecological Coherence Protocol

The EcoCo project (2014-2019) developed an 'ecological coherence protocol' to identify the best places across central Scotland for carrying out management interventions to maximise ecological, ecosystem services and socio-economic benefits. As part of the EcoCo project's LIFE funder requirements, a need existed to review, refine and show the application of the ecological coherence protocol across a wider range of habitats than those covered by the EcoCo project and thereby enhance its transferability to other regions.  The purpose of this was to aid decision making in where to focus ecological restoration and management to maximise connectivity.

The review and refinement process was carried out using two projects: the Inner Forth Habitat Network Pilot led by Inner Forth Futures and the CSGN B-Lines Project led by Buglife Scotland. Each project worked with stakeholders in their respective areas, and the EcoCo staff team, in applying the ecological coherence protocol at a local or regional level. This learning has been applied to the refinement of the protocol and its revised presentation to further enable use by other practitioners.

## 1.2 The CSGN area

The Central Scotland Green Network (CSGN) area of Scotland covers over 10,000 hectares and 19 local authority areas in Scotland (Figure 1). This area is home to over 3.5 million people and has a diverse mix of landscapes including montane, wetland, woodland and meadows.
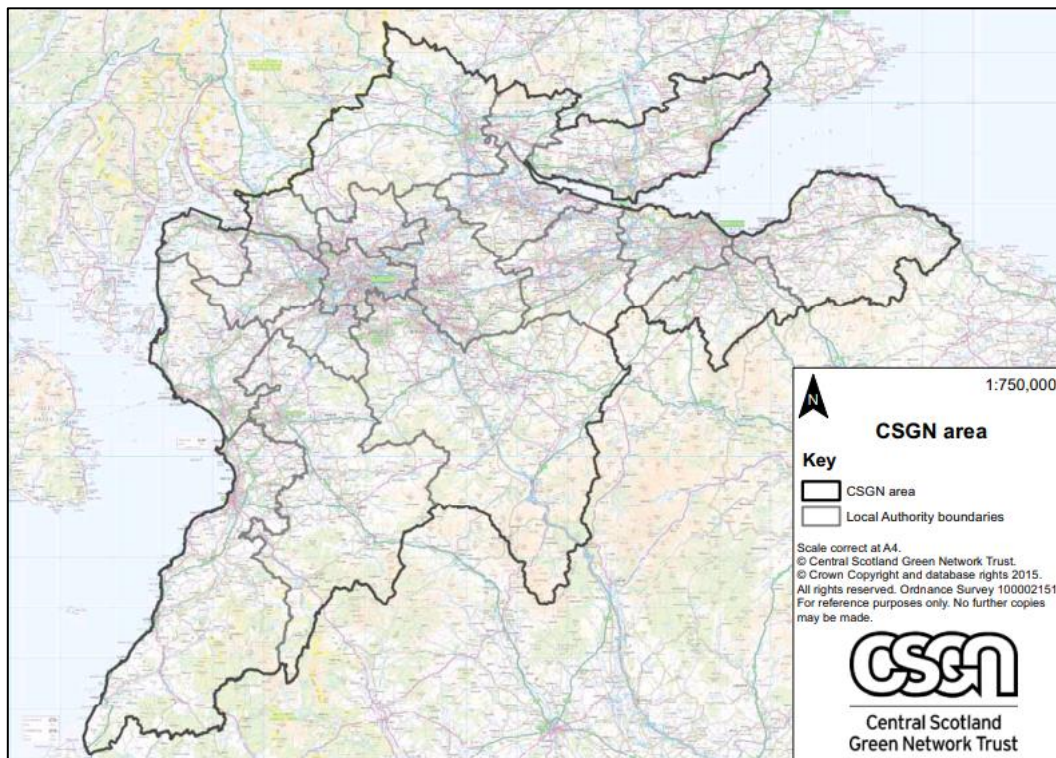


*Figure 1 Map of CSGN area (copyright from CSGN website): www.centralscotlandgreennetwork.org/delivering/our-vision*

The CSGN is a national development within the National Planning Framework which aims to make 'a significant contribution to Scotland's sustainable economic development'. It involves public agencies and stakeholders working together to align their policies, programmes and actions to achieve a common aim. The CSGN works towards five themes:

- A Place for Growth. *Creating an environment for sustainable economic growth.*
- A Place in Balance. *Creating an environment more in balance, to thrive in a changing climate.*
- A Place to Feel Good. *Creating an environmental which supports healthy lifestyles and well-being.*
- A Place to Belong. *Creating an environment that people and enjoy and where they choose to live.*
- A Place for Nature. *Creating an environment where nature can flourish.*

## 1.3 What is ecological coherence?

A definition of ecological coherence is as follows (taken from Catchpole, R. (2013), Aspen International. *Ecological Coherence Definitions in Policy and Practice - Final Report*. Contract report to Scottish Natural Heritage, No. 41102);

> *In the context of the Natura Directives, an ecologically coherent network consists of sites designated for the protection of relevant habitats and/or species. It should support habitats and populations of species in favourable conservation status across the whole of their natural range (including the wider countryside and marine areas beyond Natura 2000 sites); and contribute significantly to the biological diversity of the biogeographic region. At the scale of the whole network, coherence is achieved when: the full range of variation in valued features is represented; replication of specific features occurs at different sites over a wide geographic area; dispersal, migration and genetic exchange of individuals is possible between relevant sites; all critical areas for rare, highly threatened and endemic species are included; and the network is resilient to disturbance or damage caused by natural and anthropogenic factors.*

## 2. The Ecological Coherence Protocol pre-refinement

The EcoCo project, led by Scottish Natural Heritage (SNH) was established to deliver habitat restoration and creation to improve ecological coherence within the CSGN area. The project set out to achieve this by improving biodiversity at key sites, through habitat creation and restoration to improve habitat connectivity and coherence. The project aimed to improve habitat and species resilience, contribute to wider ecosystem services (such as improved natural flood management and reducing diffuse pollution) whilst also contributing to the CSGN's socio-economic impacts.

All sites that were worked on through the EcoCo project were tested for their value for improving ecological coherence through habitat mapping and modelling, evaluating wider ecosystem benefits and socio-economic impacts by bringing science and stakeholders together. The process and detail of which were some of the project's innovation.

In order to determine ecological coherence for EcoCo project sites the main measurable parameters considered were;

- patch size
- diversity

- habitat structural and functional connectivity
- ecological functionality
- presence of endangered, rare or endemic species

At the start of the review and refinement process, the ecological coherence protocol was illustrated as a simple Venn diagram as shown in Figure 2. It showed the three key elements that the protocol process considered when identifying the best places to work for people and wildlife: habitat networks, opportunity areas and ecosystem services. When applying the ecological coherence protocol to a site or management zone, data specific to each of these elements and the zone is sourced and considered. By considering data relevant to each element in turn, a suitable outcome is identified.
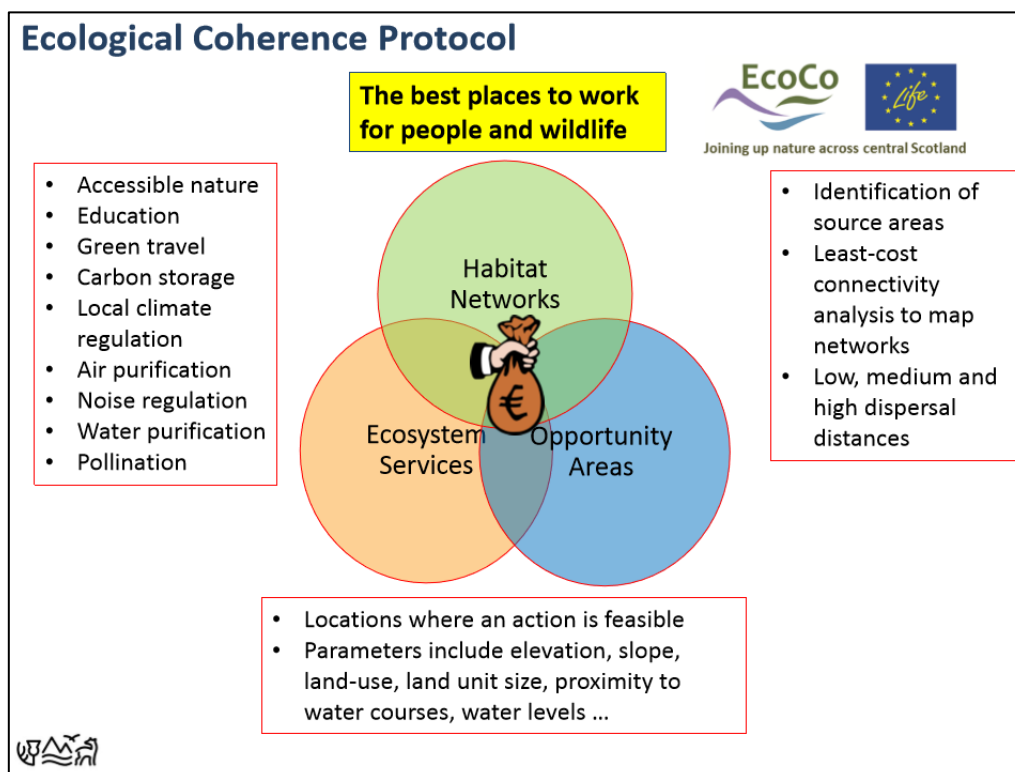


*Figure 2 Outline of the EcoCo Protocol (from the EcocoLIFE website): https://www.ecocolife.scot/sites/ecol/files/180718%20CIEEM%20Summer%20Conference%20EcoCo%20Paul%20Sizeland.pdf*

## 3. Applying and Refining the Ecological Coherence Protocol

### 3.1 Applying the Ecological Coherence Protocol in Central Scotland

In mid-2018 it was identified that there were a number of areas of ongoing work relating to habitat networks in Central Scotland with clear potential synergies. SNH had initiated a partnership approach to delivering future habitat networks in the CSGN area and were keen to pilot approaches to defining and developing these, as a way of identifying the priority areas for future investment in habitat creation. In parallel, as part of the discussions between SNH and stakeholders on

development of the National Ecological Network (NEN), a need to demonstrate how the NEN could be developed and described at a local/regional scale became apparent.

Stakeholders involved in partnership working within Central Scotland identified a clear synergy between the two work areas of EcoCo and NEN. Refinement and revision of the ecological coherence protocol was undertaken by two parallel projects working in collaboration with staff from local government, statutory bodies and conservation organisations between October and December 2018: CSGN B-Lines led by Buglife -The Invertebrate Conservation Trust; and Inner Forth Habitat Network Pilot led by the Inner Forth Futures partnership.

## 3.2 A Regional Approach: CSGN B-Lines Project

### 3.2.1 Objectives

Buglife -The Invertebrate Conservation Trust describe B-Lines as follows (taken from https://www.buglife.org.uk/b-lines-hub):

> *An imaginative and beautiful solution to the problem of the loss of flowers and pollinators… a series of 'insect pathways' running through our countryside and towns, along which we [Buglife] are restoring and creating a series of wildflower-rich habitat stepping stones. They link existing wildlife areas together, creating a network, like a railway, that will weave across the British landscape. This will provide large areas of brand new habitat benefiting bees and butterflies– but also a host of other wildlife.*

Buglife Scotland used their established B-Lines methodology with stakeholders to map and identify priority B-Lines across the CSGN area. The project objectives were:

- The development of a mapping baseline, identifying and collating appropriate data.
- Modelling of potential B-Lines networks across the project area.
- Verification of the first phase of the mapping products with key partners and stakeholders during workshops to start the identification of priority areas for action and delivery.
- Finalising a B-Lines network for the project area to focus delivery for pollinators.
- Brief review of potential opportunities and delivery across the area.

### 3.2.2 Outputs

The main output of the project is a CSGN priority B-Lines network map which was modelled from the best available local habitat data sets (supplemented by national datasets as required) and using both nationally and locally important wildlife sites and data (SSSI and Local Wildlife Sites). Modelled mapping outputs underwent a process of consultation and verification with key conservation partners during a series of workshops prior to their finalisation. The ecological coherence protocol was applied with priority given to habitat networks and opportunity areas followed by ecosystem services.

Through the B-Lines mapping, modelling, verification and finalisation process, a network of B-Lines was identified within all 19 local authorities in the CSGN as shown in Figure 3. B-Lines pass north to south and east to west and interlink with each other to form a network.

Further detail about the B-Lines methodology, connectivity modelling and project outputs can be found in the report *CSGN B-Lines*, Bairner S. & Robins J. (2018), Buglife. Buglife have made their B-Lines available online at https://www.buglife.org.uk/b-lines-hub/map
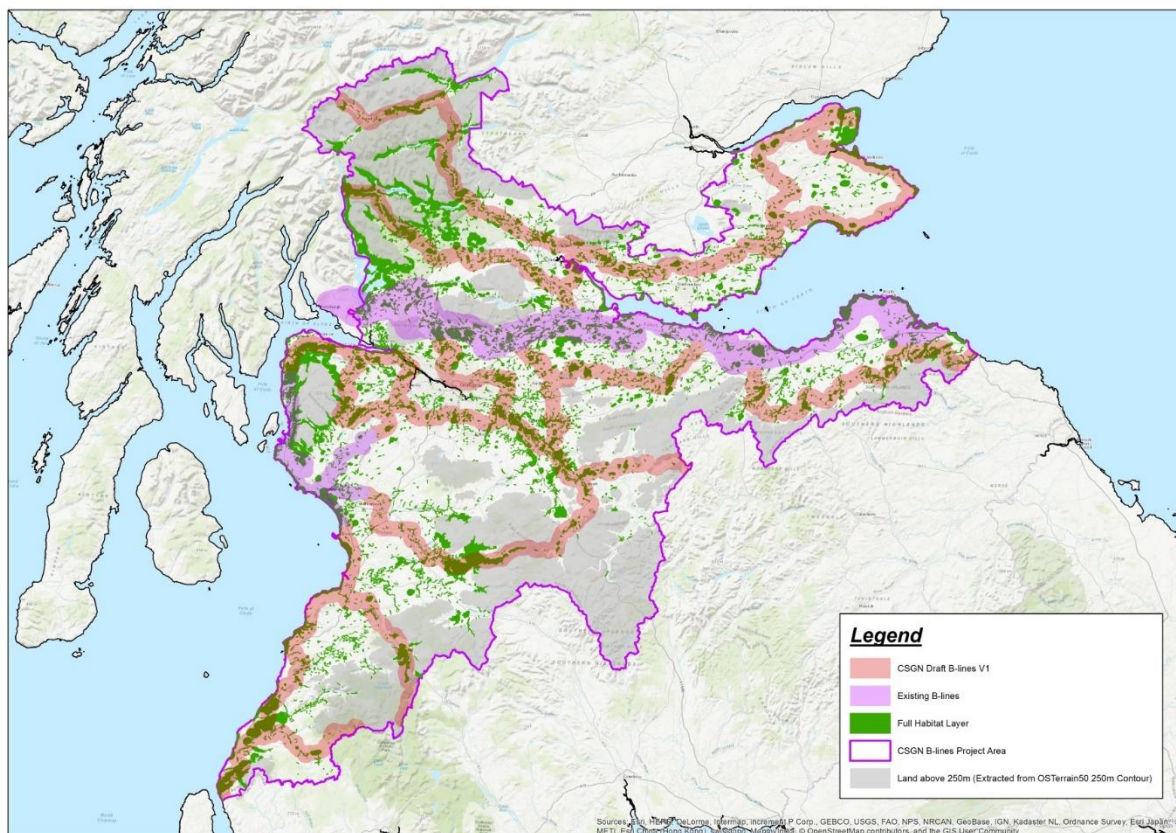
*Figure 3 Priority B-Lines linking key and beneficial habitat across CSGN area. Based upon LCM2007 © NERC (CEH) 2011. © Crown Copyright 2007, Ordnance Survey number 100017527. © third party licensors.*

### 3.2.3 Future Work

The B-Lines mapped throughout the CSGN using the ecological coherence approach will help to widen the UK network of B-Lines which previously stopped at the Scottish border; only the John Muir Way B-Line and B-Lines in North Ayrshire had previously been mapped with no connection to each other or B-Lines in the north of England. Buglife will promote the new B-Lines to CSGN partners and seek opportunities to work in collaboration to deliver these pollinator networks on the ground. Delivery is likely to be tied to availability of funding and will vary between local authorities. Delivery of the B-Lines will help contribute to delivery of the Pollinator Strategy for Scotland and help to develop the National Ecological Network.

## 3.3 A Local Approach: Inner Forth Habitat Network Pilot

### 3.3.1 Objectives

The Inner Forth Futures partnership used the strong knowledge base and partnership to pilot partnership approaches to defining and developing a habitat network for the CSGN areas within Stirling, Falkirk, Clackmannanshire and Fife local authorities. The pilot objectives were:

- Identification of a mapping baseline, identifying and collating appropriate data.

- Sense-checking and refining the mapped habitat network with key partners and stakeholders during workshops to start the identification of delivery opportunity areas and eco-system services benefits.
- Finalise a mapped habitat network showing areas for: conservation and management or restoration; and opportunity network (creation or enhancement of key habitat types).
- Drafting an action plan for the area linked to delivering the mapped habitat network.

### 3.3.2 Outputs

The Pilot produced a mapped concept of an Inner Forth Habitat Network (Figure 4 and Figure 5) that is accompanied by a user guide and a draft call-to-action that describes how, where and when the concept should be delivered on the ground. The network was generated by applying the three key elements of the ecological coherence protocol in a specific order: habitat networks, then ecosystem services and lastly opportunity areas.

Initial mapping of five key habitat types within the Pilot area was generated using available CSGN integrated habitat network (IHN) data. Key habitat types for the Pilot area were identified as:

- Wetland (later revised to Rivers & Wetland),
- Intertidal,
- Peatland & Heathland,
- Pollinator (later revised to Grassland and Open Mosaic Habitat),
- Woodland.

IHN data was supplemented and sense-checked through application of local knowledge and additional local and national data-sets of habitats, designated or protected areas and key ecosystem services provisions. Mapped data was sense-checked and reviewed by key conservation partners at each stage during a series of workshops. Participants' local knowledge, wider strategic vision for identifying opportunities to deliver actions, and consideration of additional stakeholders who should be given the opportunity to review and comment on the Habitat Network was key to generating a landscape-scale mapped concept and identifying future and further work.

Pilot outputs will be made available on the Inner Forth Futures website at www.innerforthlandscape.co.uk

### 3.3.3 Future work

Participants in the Inner Forth Pilot identified a series of next steps to seek wider support for the mapped habitat network concept and finalise the draft call to action to enable it to be embedded in CSGN plans. Primarily review and finalisation will be through a widened membership of the Inner Forth Natural Heritage Working Group, but also the Scottish Biodiversity Strategy Landscape-Scale Conservation working group. There is a desire to continue working in partnership and to use the mapped output and call to action to identify future joint and organisational project delivery. The group were clear that they had a role in positively promoting the work and reviewing any action. The mapped output will help to define and illustrate how the National Ecological Network could be delivered at a regional level.
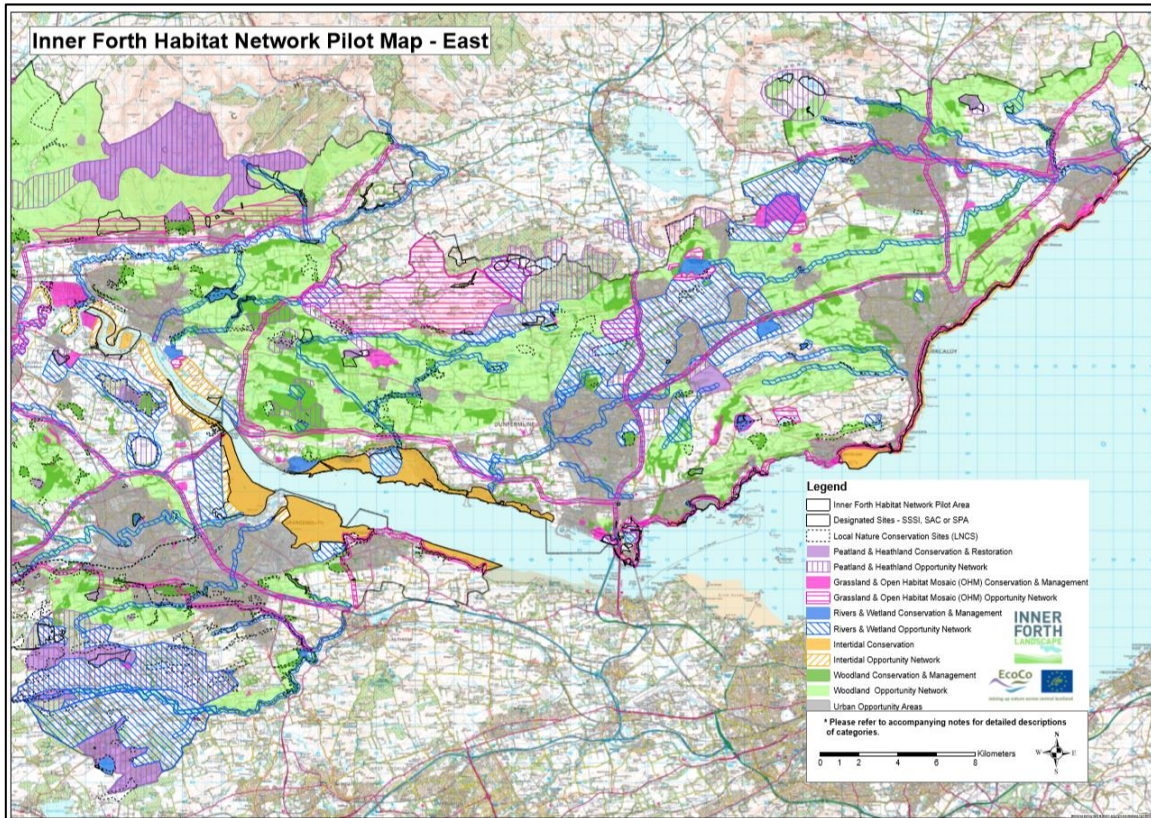
*Figure 4 Inner Forth Habitat Network Concept Map (East).*
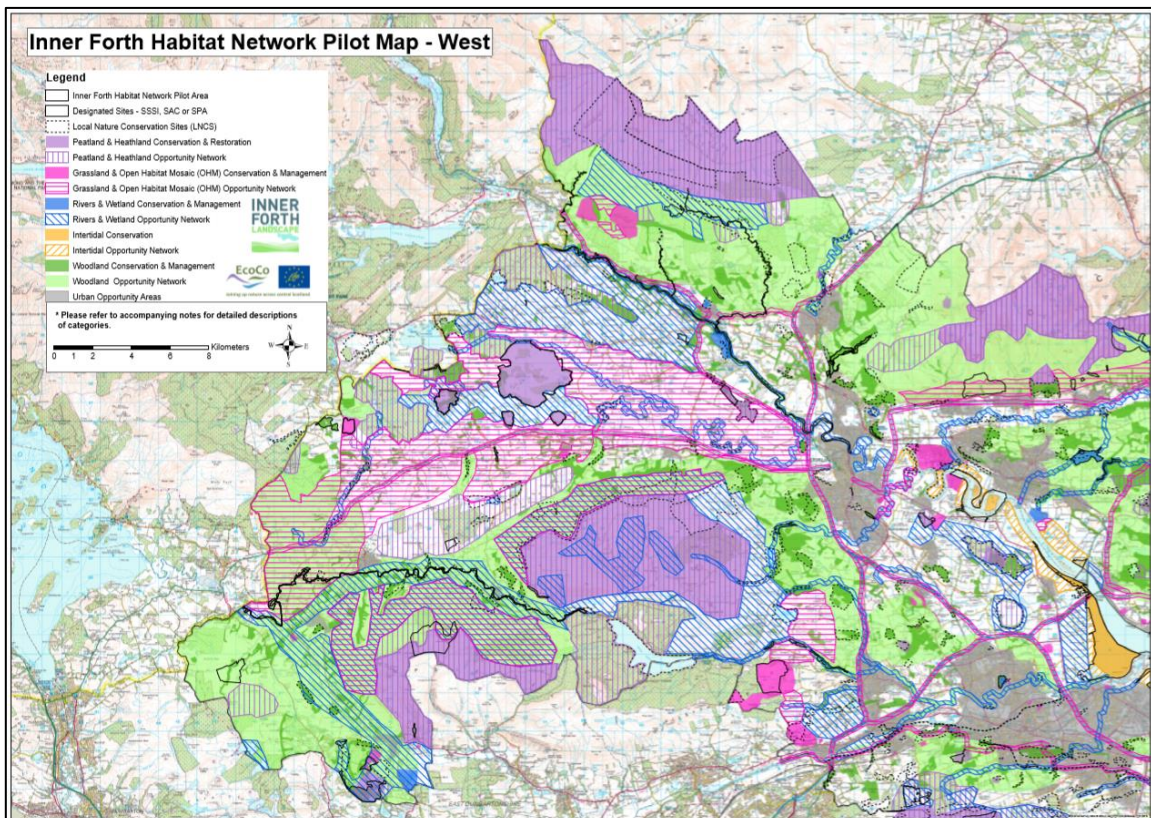


*Figure 5 Inner Forth Habitat Network Concept Map (West).*

## 3.4 Refining the Ecological Coherence Protocol

Both the CSGN B-Lines Project and Inner Forth Habitat Network Pilot successfully applied the ecological coherence approach in delivering their work. To refine the protocol itself for future use, each project leads sought feedback from participants to help refine how the concept and method could be described, implemented and presented. Findings included:

- A requirement to explain the term ecological coherence to ensure mutual and consistent understanding.
- A well-primed group will feel more confident to contribute: Brief participants when they are invited to participate in the process, and supplement this with brief overviews of meetings/workshops as a prompt at each stage.
- Depending on the users, the protocol may want to be 'entered' at a different element. This requires further testing, but is considered appropriate as long as all three elements (habitat networks, ecosystem services, opportunity areas) are included in the approach.
- Participants may hold data and knowledge that is of mutual benefit: be welcoming of new ideas and information that could help to shape the end-product; include stakeholders when you are identifying which data sets or data types to include in the process.
- Remember that there will be a limit to how much data you are able to, or wish to review.
- As each new element of the approach is considered/applied, it will help to refine, inform and sense-check outputs generated through previous elements. Do not start over each time.
- Practical delivery constraints should be considered alongside mapped data to ensure that the final mapped output is feasible. Outputs can be bold, but should not be seen as inaccurate or impossible or stakeholders may not wish to 'own' them.
- Ask participants how they see the outputs assisting their organisations.
- Ensure there is sufficient time allocated to reviewing the conclusions of the process and that stakeholders have an opportunity to raise concerns.
- Review the language used to explain your outputs/conclusions so that there is consensus on the meaning and your work cannot be misinterpreted.
- Ask stakeholders how they wish to take forward or implement the work, how they can help achieve any mapped work for delivery and what body or process should be used to review process and hold participants to account (if appropriate).

These findings were used to help develop *Ecological Coherence: A Practitioners' Guide*, a printed and online document that was developed to showcase the approach and guide potential users through each stage.

## 4. The Refined Ecological Coherence Protocol

### 4.1 Ecological Coherence Components

*Ecological Coherence: A Practitioners' Guide* introduces users to this integrated approach and presents the three components in a revised manner that shows when combined, they flow into a coherent product (Figure 6). The guide terms these areas as 'triple-win' locations.
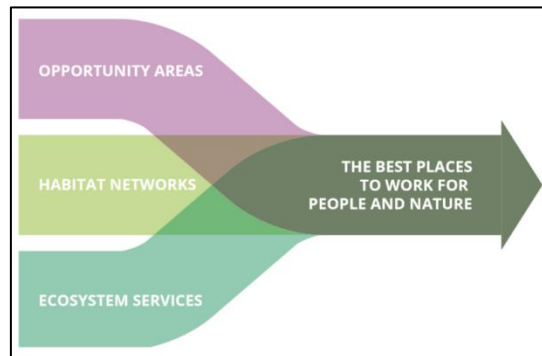
*Figure 6 The three components of ecological coherence taken from 'Ecological Coherence: A Practitioners' Guide'.*

## 4.2 The Ecological Coherence Approach in Practise

*Ecological Coherence: A Practitioners' Guide* presents the approach via an easy to follow infographic (Figure 7) that takes the user from preparation, through data identification and review to conclusions and implementation. For additional understanding, the Inner Forth Habitat Network Pilot is presented as a case study within the same document.

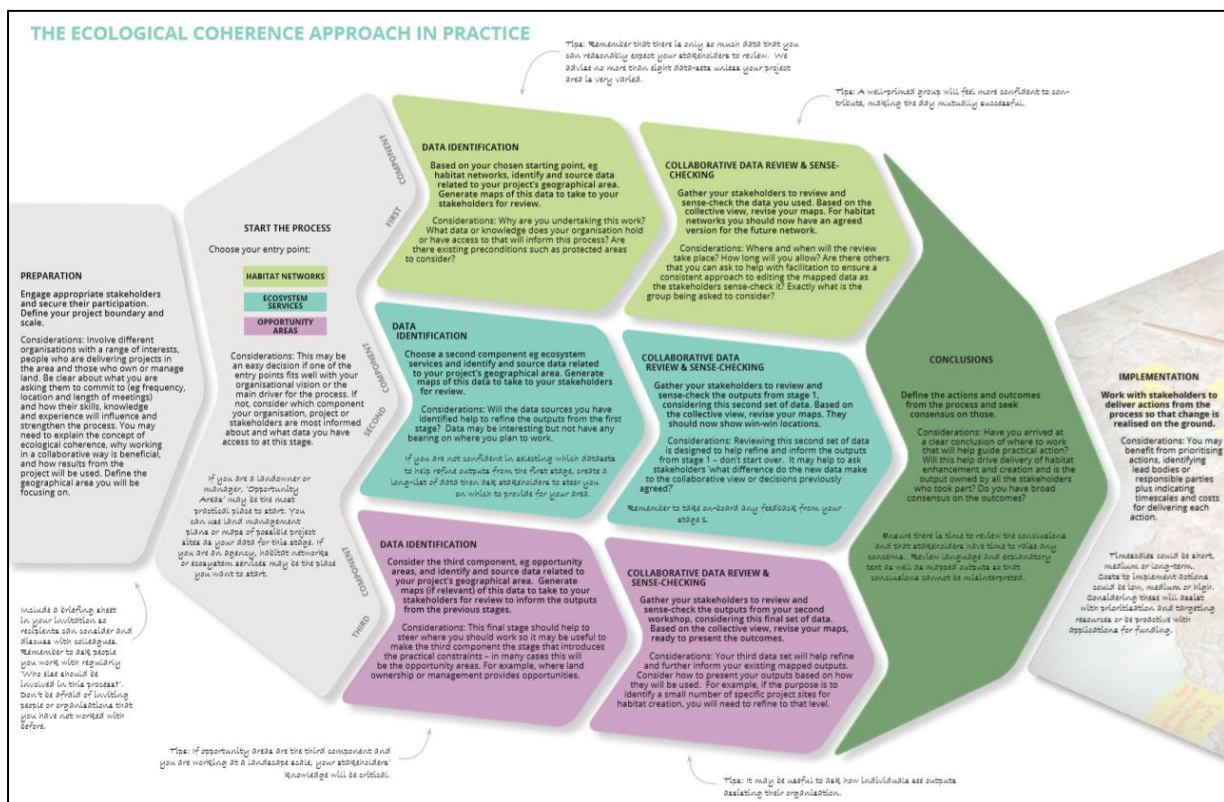The guide will be available to download from the EcoCo website at www.ecocolife.scot



*Figure 7 The Ecological Coherence Approach in Practise, taken from 'Ecological Coherence: A Practitioners' Guide'.*

## 4.3 Future Uses for the Ecological Coherence Approach

Participating stakeholders within the Inner Forth Habitat Network Pilot agreed that the collective approach to mapping and identifying ambitions mean that:

- They could be clear about which areas to protect
- They can maximise ecological benefits
- They can look for win-wins for people, nature and ecosystems
- An agreed habitat network ambition could help to:
  - Target resources
  - Help funders focus on the priorities
  - Influence agri-environment and land use plans
  - Direct mitigation and planning gains
- A collective voice is more representative of shared aims.

Presenting the approach to a wider network of practitioners has so far had a positive response as illustrated by these comments from Ian Mackenzie, Living Landscape Programme Manager at Scottish Wildlife Trust:

> *If the City of Edinburgh Council's application to the Future Parks Accelerator is successful, the Ecological Coherence protocol will be used to help identify and priorities the ecological changes needed in the cities greenspaces. This will be integrated into the new vision and strategy for the city's parks, greenspaces and cemeteries.*

> *The examples produced by the Inner Forth Landscape Partnership and the production of the simplified protocol has enabled us to clearly advocate its use in this project. If this project is successful it will create the basis for a sound strategy of ecological change across the cities 140 publicly owned greenspaces.*

## 5. Acknowledgements