

The Inner Forth Habitat Network Pilot



The River Forth and Stirling viewed from Abbey Craig / Inner Forth Futures.

March 2019

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1. Introduction

1.1 Partnership, Policy and Projects in Central Scotland

In the Inner Forth area, a suite of habitat enhancement and creation works had taken place funded by the LIFE financial instrument of the European Community and the National Lottery through the Heritage Lottery Fund. These funding streams had enabled the EcoCoLIFE (2014-2019) and Inner Forth Landscape Initiative (2014-2018) partnership projects respectively, to work with landowners and managers, communities and other interested organisations including the third sector, local authorities and statutory agencies to develop and deliver works that had benefitted the landscape's natural heritage, ecosystems and communities.

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. Scottish Natural Heritage (SNH) had initiated a partnership approach to delivering future habitat networks in the Central Scotland Green Network (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. The EcoCo project had 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 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 (an evolution of the Inner Forth Landscape Initiative partnership) 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 to produce a mapped habitat network concept. In the case of the Inner Forth Habitat Network a call-to-action was created alongside the map to help initiate delivery of the network concept and seek wider stakeholder buy-in, thus identifying the priority areas for future investment in habitat creation.

1.2 The Inner Forth Landscape

Between 2012 and 2018 a partnership of eight organisations, (Clackmannanshire, Falkirk, Stirling Councils, Central Scotland Green Network Trust, Historic Environment Scotland, RSPB Scotland, Sustrans and Scottish Natural Heritage) worked successfully together with local community groups, individuals and organisations to develop and deliver an ambitious programme of work centred on the Inner Forth of Forth from Stirling to Blackness – the Inner Forth Landscape Initiative (IFLI). IFLI, core funded by the National Lottery through the Heritage Lottery Fund, focused on enhancing, celebrating and sharing the natural, cultural and built heritage of this place. It additionally made connections to a wider defined area as the partnership recognised the potential to benefit a diversity of heritage and communities at a landscape-scale.

With the end of the IFLI programme in September 2018 the partnership expressed a continued desire to work across the wider Inner Forth area and was joined by Fife Council. This expanded partnership, with the new name of Inner Forth Futures (IFF), was established with four key objectives, the fourth of which the Inner Forth Habitat Network Pilot could assist in delivering:

To increase the area's resilience by piloting ways to develop habitat networks and climate adaptation.

The IFF partnership define the 'Inner Forth area' as the connected estuary, floodplain and settlements from Old Stirling Bridge to Blackness Castle and Rosyth. However, for the purpose of the Pilot, a larger area was considered. The Inner Forth Habitat Network Pilot area covered the Central Scotland Green Network (CSGN) areas within Clackmannanshire, Falkirk, Fife and Stirling local authority areas (Figure 1).

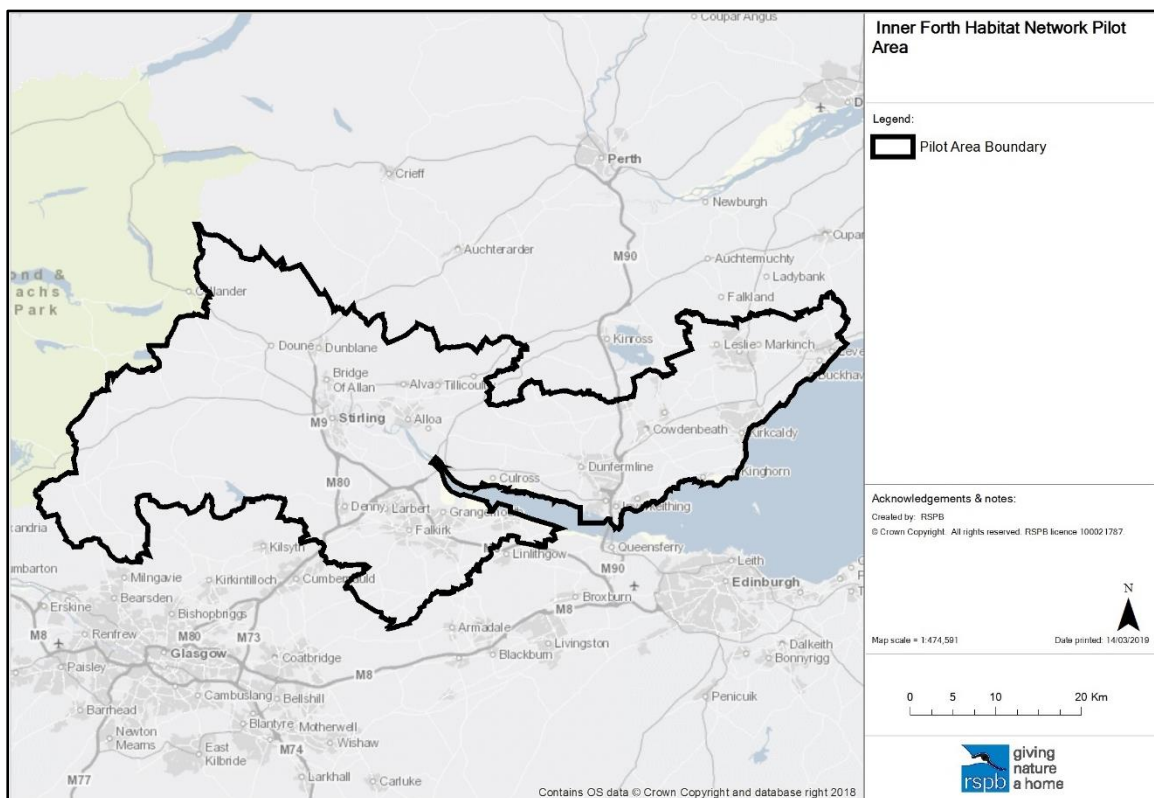


Figure 1 Inner Forth Habitat Network Pilot Area

The area considered through the Pilot project has a population of over 485,000 and contains the major centres of Dunfermline, Kirkcaldy, Stirling, Falkirk, Alloa and Grangemouth. Running from mouth of the River Leven at Methil and the Firth of Forth in the east to the Ochil hills in the north, the towns of Killearn and Balfron in the west and Slamamman Plateau beyond Falkirk in the south, the Pilot area supports internationally important wildlife and, for hundreds of years, supported trading, industrial and leisure activity. With elevation ranging from sea-level to 700m the landscape contains a wider variety of habitats from intertidal and saltmarsh, through to peatland, heathland and assortments of wetland and grassland.

1.3 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 2). This area is home to over 3.5 million people and has a diverse mix of landscapes including montane, wetland, woodland and meadows.

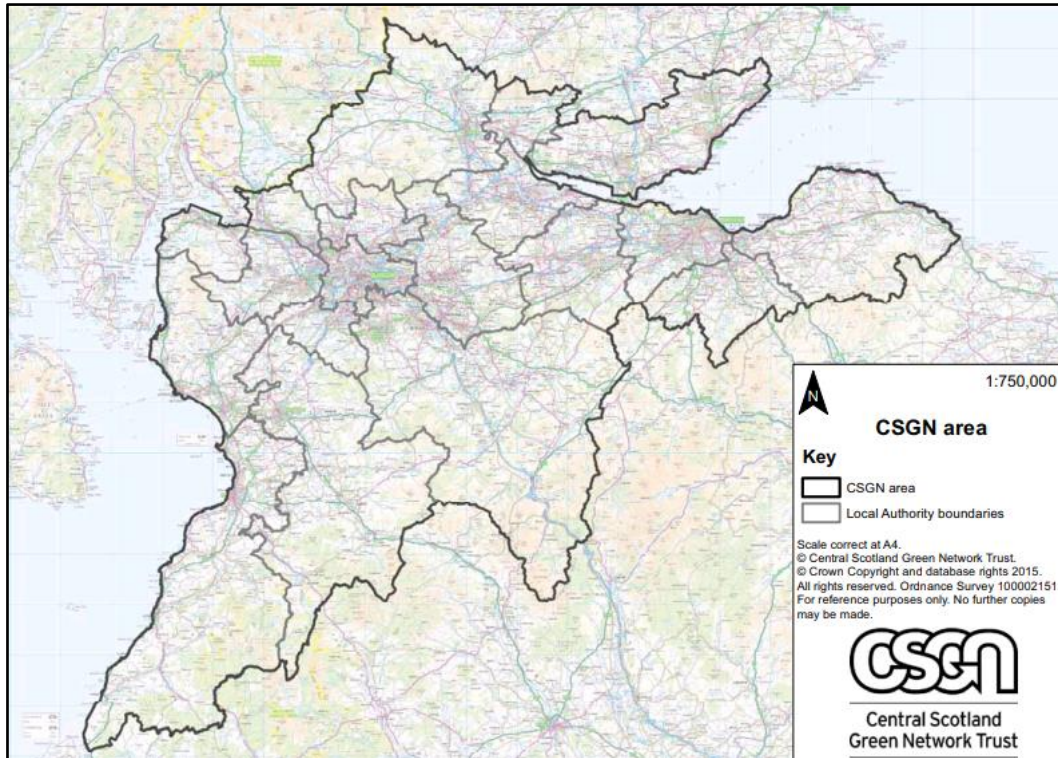


Figure 2 Map of CSGN area (copyright from CSGN website): www.centralscotlandgreennetwork.org/delivering/our-vision

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.*

2. Ecological Coherence and the Ecological Coherence Protocol

The Inner Forth Habitat Network Pilot used the EcoCo project ecological coherence protocol to develop and refine the mapped network concept and associated call-to-action. Through use of the protocol, the Pilot and the Buglife Scotland ‘CSGN B-Lines Project’ helped to review and refine the protocol and create *Ecological Coherence: A Practitioners’ Guide*, a new way for the protocol to be presented which will enable its further use by other practitioners. *Ecological Coherence: A Practitioners’ Guide*, is a print and online document that was developed to showcase the approach and guide potential users through each stage. Further detail of the protocol review and refinement can be found in *Reviewing and Refining and Ecological Coherence Protocol Using the Inner Forth Habitat Network and CSGN B-Lines* (Burgess S. and Fuller K. 2019).

The original ecological coherence protocol was a Venn diagram (Figure 3) that showed the three key components that the protocol process considered when identifying the best places to work for people and wildlife:

- habitat networks,
- opportunity areas,
- and ecosystem services.

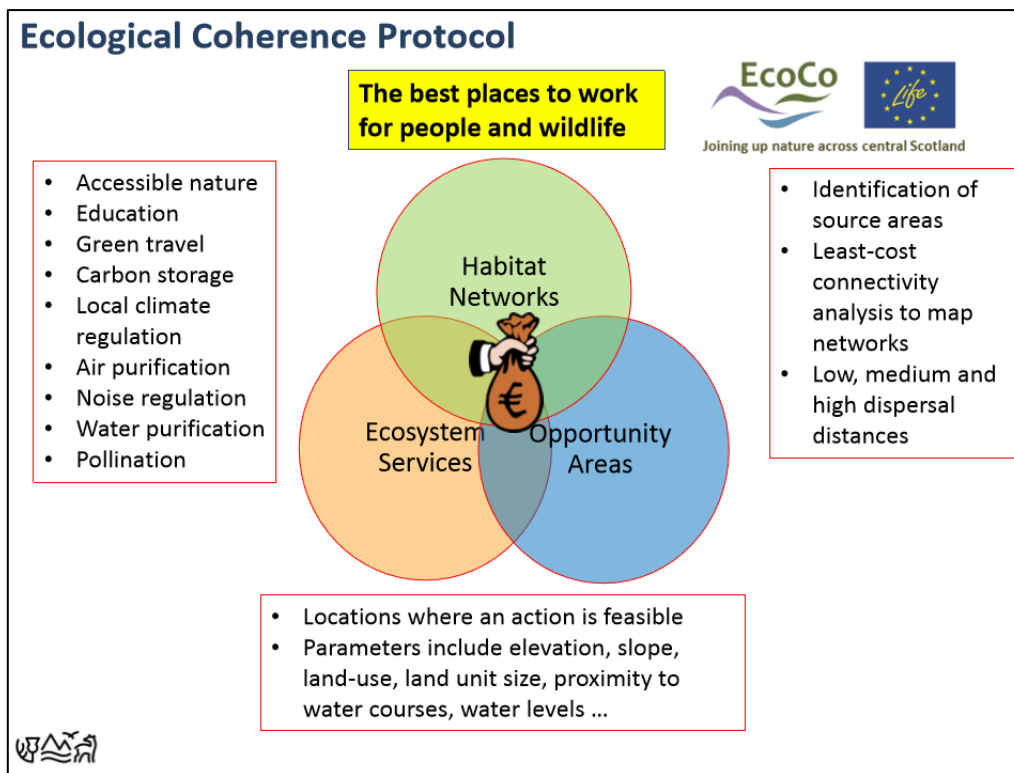


Figure 3 Outline of the EcoCo Protocol (from the EcocoLIFE website):
<https://www.ecocolife.scot/sites/ecol/files/180718%20CIEEM%20Summer%20Conference%20EcoCo%20Paul%20Sizeland.pdf>

When applying the ecological coherence protocol to a site or management zone, data specific to each of these components and the zone is sourced and considered in turn, building knowledge at each stage. By considering data relevant to each element in turn, a suitable outcome is identified.

2.1 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.

2.2 Ecological Coherence Components

Ecological Coherence: A Practitioners' Guide introduces users to this integrated approach and presents the three components (habitat networks, opportunity areas and ecosystem services) in a revised manner that shows when combined, they flow into a coherent product (Figure 4 **Error! Reference source not found.**). The guide terms these areas as 'triple-win' locations.

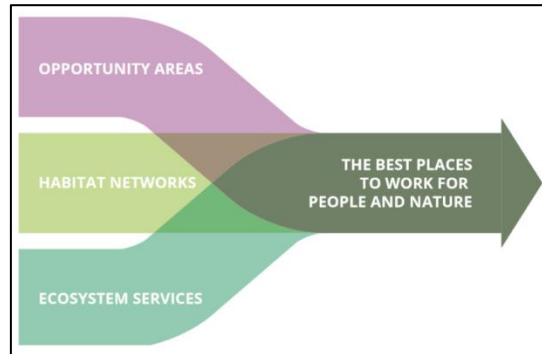


Figure 4 The three components of ecological coherence taken from 'Ecological Coherence: A Practitioners' Guide'

2.3 The Ecological Coherence Approach in Practise

Ecological Coherence: A Practitioners' Guide presents the approach via an easy to follow infographic (Figure 5) that takes the user from preparation, through data identification and review to conclusions and implementation. Key stages of the ecological coherence approach are titled as:

- Preparation,
- Start the process (this is where the component to start the process through is decided)
- Data identification (data of relevance to the first, second and third components are taken in turn)
- Collaborative data review and sense-checking (review is undertaken of the data gathered for each of the first, second and third components in turn. It is important that you do not start again with each new dataset considered)
- Conclusions,
- 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 and the Inner Forth Futures website at www.innerforthlandscape.co.uk

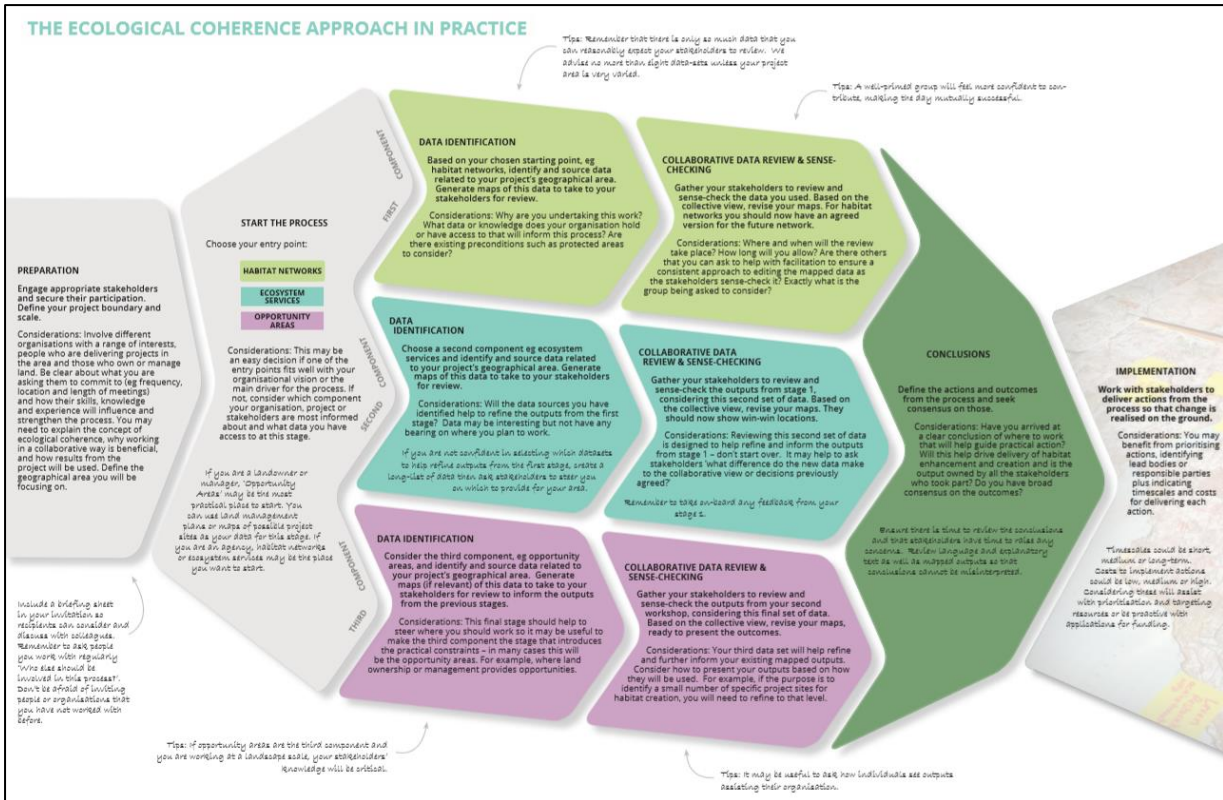


Figure 5 The Ecological Coherence Approach in Practise, taken from 'Ecological Coherence: A Practitioners' Guide'

3. Inner Forth Habitat Network Pilot

3.1 Aim and Objectives

The Pilot aimed to trial the prioritisation, mapping and promotion of a habitat network for the CSGN areas within the Stirling, Falkirk, Clackmannanshire and Fife local authority areas to demonstrate how local delivery of the National Ecological Network could be achieved. The Pilot would be achieved through use of the Inner Forth Futures partnership strong knowledge base and prior experience in collaborative working.

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.

3.2 Methodology

The Pilot used the EcoCo ecological coherence protocol, refining it's use during the project for the benefit of future users.

3.2.1 Preparation

The geographical limit of the Pilot was set as the CSGN areas of the Stirling, Clackmannanshire, Falkirk and Fife local authority areas as shown in Figure 1.

The Inner Forth Futures team invited staff to participate from IFF partner organisations, other species-focused NGOs who work in the area, statutory agencies, environmental project staff and Local Biological Records Centres. All invitees were provided with a two-sided briefing sheet that outlined the aim of the Pilot, its geographical extent and the process that would be followed. The stakeholders were invited to participate in three facilitated meetings, each a month apart. This time allowed the team to select data sources, generate maps and plan activities between each meeting.

3.2.2 Start the process

It was decided to apply the three elements of the protocol in the following order:

1. Habitat Networks
2. Ecosystem Services
3. Opportunity areas

The Pilot initiated the process with 'Habitat Networks' as the IFF partnership wished to create a shared habitat network vision for the area. This had stemmed from the interests of the Inner Forth Natural Heritage Working Group, a collection of local authority, NGO and agency stakeholders who had met regularly since 2011 to discuss and share habitat and species-focused projects and activity in their geographical area of interest.

3.2.3 Data Identification (first component: Habitat Networks)

To select datasets, it was necessary to identify which habitat types the Pilot should consider. The following five were selected as key habitats for the Pilot area:

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

The Pilot team had ready access to a range of habitat data for the case-study area which was complemented with Integrated Habitat Network datasets (IHN) courtesy of local authorities. ArcGIS was used to handle the datasets and produce bespoke A0 basemaps, which were then printed.

3.2.4 Collaborative Data Review & Sense Checking (first component: Habitat Networks)

The first stakeholder meeting took the form of a day-long facilitated session on 12th October 2018 in Stirling. Twenty representatives from statutory agencies, local authorities and conservation charities took part in this first meeting. Zoe Clelland (Regional Conservation Manager, RSPB Scotland) introduced the Pilot including; why propose a habitat network, intended outputs and links to policy objectives namely CSGN theme of 'A Place for Nature' and a National Ecological Network. Paul Sizeland (EcoCo LIFE Programme Manager, SNH) introduced the ecological coherence protocol and how it seeks to identify the best places to work for people and wildlife. Kate Fuller (Inner Forth Futures Project Manager) outlined the agenda for the day.

During the morning session, attendees circulated around A0-sized maps of the five key habitat types. Aided by facilitators at each map, attendees colour coded sections of the map (Figure 6) to indicate their answers to two questions posed:

- Where are the important habitat areas that should be protected? (marked as ///)
- Where are the opportunities for new habitat and/or habitat network development? (marked as ...)

Attendees had time to focus on contributing to two to three habitats before reviewing all maps.



Figure 6 Example annotated map from meeting one

During the afternoon session, attendees produced an agreed habitat ambitions map for the Pilot area that combined the mapped habitat conclusions from the morning session. This map was split into Inner Forth East and Inner Forth West for ease of groupwork. During this process some locations were identified as conflicted due to overlaps between either:

- two or more habitat types noted as important areas to protect and/or,
- conflicts between areas where there were opportunities for habitat network development.

In these cases, attendees discussed options before selecting which habitat to map. There were relatively few conflicts as groups had discussed and predicted linkages between habitat types during the morning (Figure 7). The group also noted information or inputs that could have been useful to inform the work of this first meeting:

- Ancient Woodland Inventory,
- SEPA Wetland Inventory,
- land use/agriculture/land capacity,
- Marine Scotland and Forestry Commission Scotland perspective,
- land ownership,
- large landscape projects eg Carse of Stirling Partnership, Inner Forth Futures, EPIC.

The Ancient Woodland Inventory was added to the digitised map for meeting two as the 'Woodland Protect' layer. The SEPA Wetland Inventory was not added to the digitised map but following a separate conversation with SEPA staff, the project team cross-checked data from the Inventory against the wetland layers of the digitised map to ensure that SEPA's priority areas were incorporated within this Pilot.

Following the meeting these combined Inner Forth East and Inner Forth West maps were digitised as joint habitat ambitions of the Pilot. Stakeholders had an opportunity to re-visit printed versions of the newly digitised habitat ambitions maps during meeting two.



Figure 7 Habitat ambition discussions at meeting one

3.2.5 Data Identification (second component: Ecosystem Services)

Ecosystem services was selected as the second component to be considered. During the afternoon of the first meeting and following habitat ambitions mapping, the stakeholder group were asked to identify which ecosystem services were most important to the Pilot area and key habitats. A short discussion followed where the group felt that ecosystem services provision would be unlikely to cause significant changes to their habitat ambitions. During the discussion, the group identified important ecosystem services for the area as:

- biodiversity,
- climate change adaptation and mitigation,
- water management and flood protection,
- cultural services (access, aesthetics, health support and heritage; air quality),
- food and materials production.

As a result of this discussion it was agreed that during meeting two the group would sense-check the digitised habitat ambitions against the following information and maps:

- Land capacity mapping (as evidence of food production potential),
- Flood risk,
- Air quality,
- Scottish Index of Multiple Deprivation,

Following meeting one the IFF team sourced data relating to these services and brought simple maps showing each dataset to meeting two.

3.2.6 Collaborative Data Review & Sense Checking (second component: Ecosystem Services)

The second stakeholder meeting took place during the afternoon of 12 November 2018 in Stirling with seventeen participants. The purpose of this second meeting was to sense-check a digitised version of the habitat ambitions map that had been collaboratively created during meeting one (Figure 8) and to consider the second part of the ecological coherence protocol, ecosystem services.

During meeting two stakeholders used maps of the four agreed ecosystem services to review the digitised habitat ambitions map.

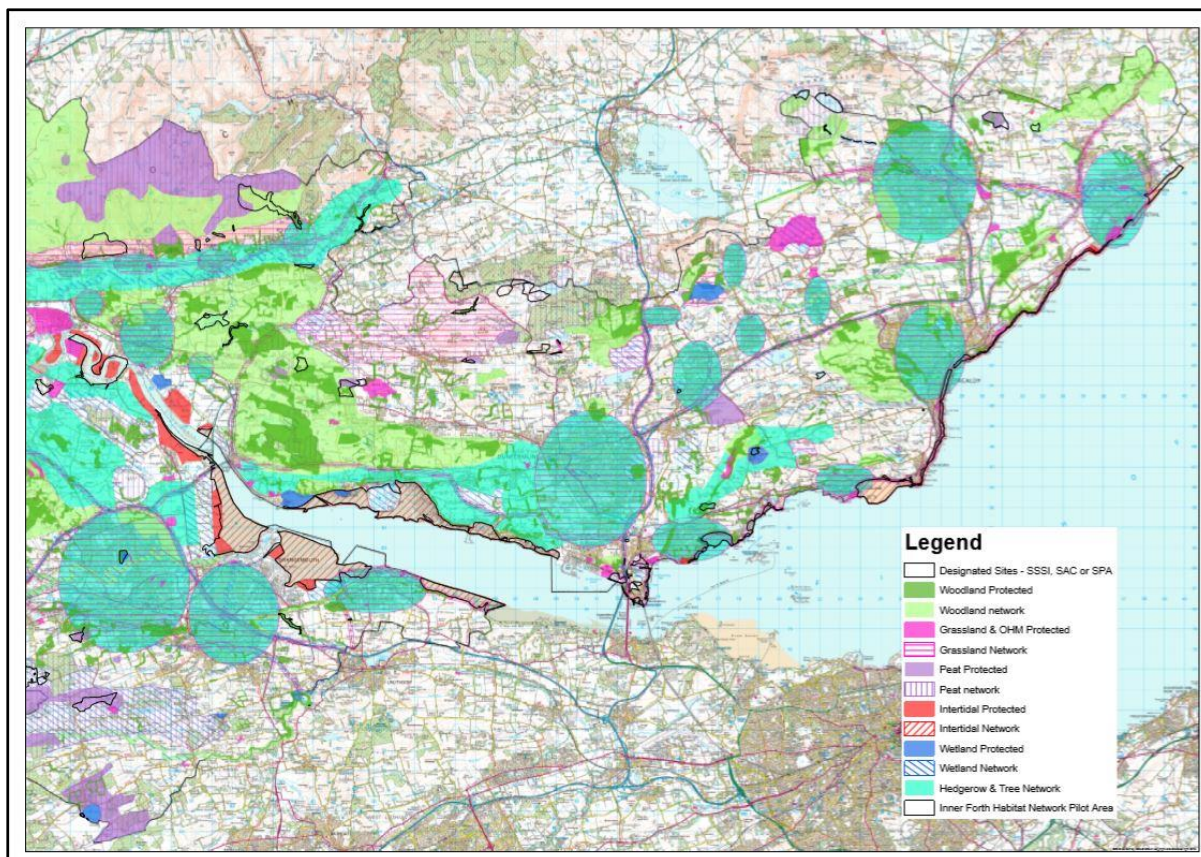


Figure 8 Master Map (Inner Forth East) used as a starting point for meeting two

Attendees were split into two groups to consider the Inner Forth East and Inner Forth West areas, before swapping to ensure that each participant had an opportunity to review the whole Pilot area. In each group, the attendees were asked to sense-check and update the digitised habitat ambitions maps, by considering the following:

- Identify any overlaps or conflicts between habitats: *Are we showing a mosaic, or is one habitat type the focus in this location?*
- Identify any areas that we missed last time. *Do they need mapping as a habitat type?*
- Any blank areas with no habitat type: *Are we content with these being blank? Should there be a habitat here?*
- Giving consideration to Ecosystem Services identified in meeting one. Maps of each service compiled from a range of sources were provided: *Do these amend or change the habitat areas to protect or habitat creation opportunity areas shown on the digitised map?*
 - Flood Maps, SEPA. www.sepa.org.uk/
 - Air Quality www.scottishairquality.scot
 - Scottish Index of Multiple Deprivation. Copyright Scottish Government, contains Ordnance Survey data © Crown copyright and database right (2016) www.data.gov.uk
 - Land capability for agriculture: <http://soils.environment.gov.scot/>
- Giving consideration to Buglife's B-lines maps: *Do these amend or change the grassland and open mosaic habitat layers shown on the digitised maps?*

The group felt that the way consideration of ecosystem services had been allowed for through this meeting was satisfactory. They noted that the mapped services did not seem to change any

previously mapped habitat ambitions. It was queried whether this was due to not enough data, limitations of the data, and that perhaps the outcome may be different in another location.

SEPA and the Woodland Trust shared that both organisations had separately undertaken ecosystem services studies or reviews in the course of their work or duties. Following meeting two the IFF team reviewed selected SEPA ecosystem services datasets and sense-checked these against the outputs of the meeting. A small change was made due to a conflict between woodland habitat ambitions and agricultural ecosystem services in one section of a local authority area. Changes were also made to the colouring of the layers as shown in Figure 9.

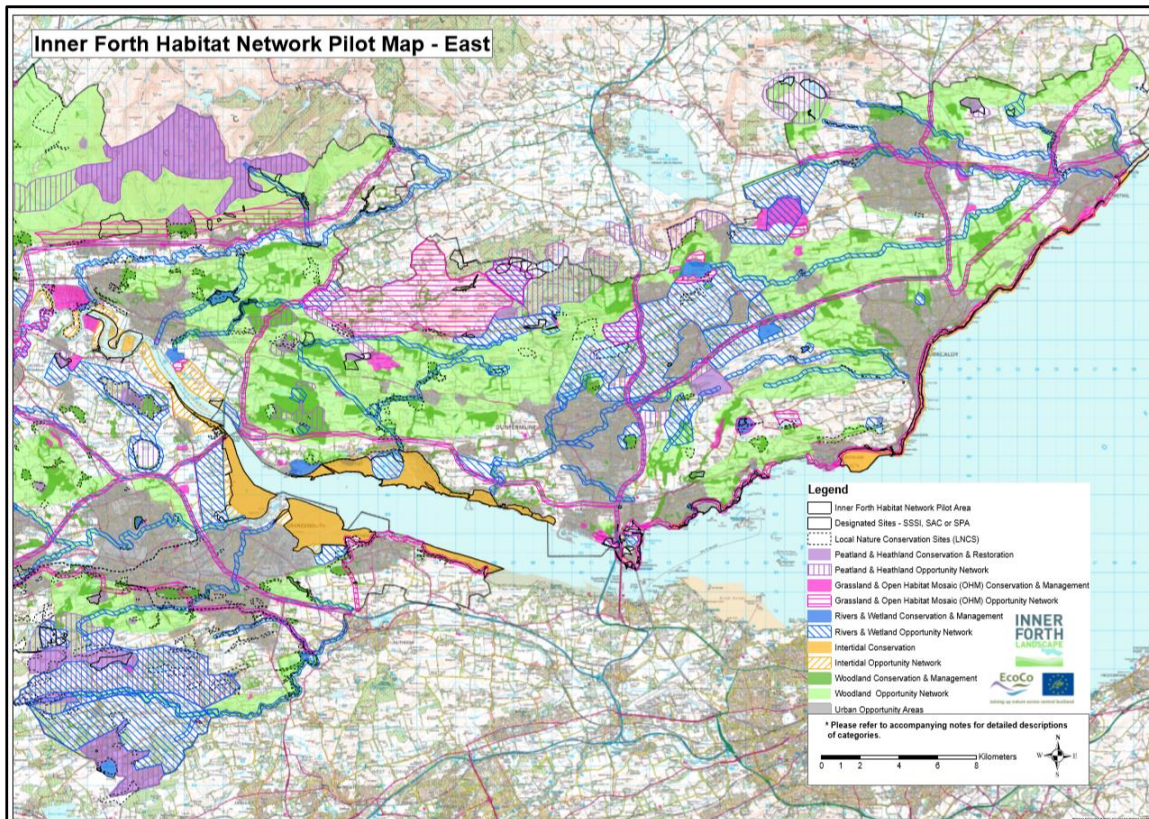


Figure 9 Revised Inner Forth Habitat Network Pilot map following meeting two

3.2.7 Data Identification (third component: Opportunity Areas)

This third component of the ecological coherence protocol was considered during meeting two. In two groups, attendees discussed known, possible or blue-sky thinking ideas that could deliver work tied in with the mapped areas for habitat protection or enhancements and creation (Figure 10). The 'What' and 'Where' of each opportunity was written on a post-it note. The group then had time to review the collection of opportunities. Stakeholders discussed specific or pan-landscape existing and potential barriers to delivering opportunities identified and listed these.



Figure 10 Discussing Opportunity Areas during meeting two

3.2.8 Collaborative Data Review & Sense Checking (third component: Opportunity Areas)

In preparation for meeting three the IFF team reviewed the opportunity ideas and grouped them by theme. Themes were the previously noted key habitat types for the Pilot plus urban and agricultural. Any duplicate ideas were removed and ideas were then divided by those which were location specific versus those that were scalable (ie appropriate across the whole landscape).

The third meeting took place on the afternoon of 3rd December 2018 in Stirling and was aimed at action-planning the collective vision and gaining further support for the mapped habitat network that had emerged through piloting the ecological coherence approach with stakeholders. Using the long-list of opportunities that had previously been identified, the group were asked:

- What actions are required at each level to realise the opportunities? (Strategic planning / Organisational / Project or site / Community)
- What are the actions – can we make them measurable?
- Who is responsible (& who can support).
- Is this action short, medium or long-term?

Participants discussed their views and noted their collective responses by habitat type. This collaborative action planning was written up by the IFF team so that it could be later reviewed by the stakeholders.

3.3 Conclusions

At the close of the third meeting, the group agreed the value of the Pilot process and that they wished to meet again in early 2019 to further review the call to action and start to identify methods to implement the mapped habitat network concept.

3.3.1 Data Presentation and Terminology

During meeting three, the final mapped vision for an Inner Forth habitat network concept as developed through the ecological coherence protocol process was presented. The group strongly agreed that rather than leaving blank areas on the map (which could signify that there are no habitat

ambitions at all for these areas), there should be a background or baseline layer applied that is not habitat specific, but identifies that the whole Pilot area has opportunities for habitat enhancement and creation.

Following discussions focused on understandings of terminology, it was agreed to name the layers of the concept map as follows:

- Inner Forth Habitat Network Pilot
- Designated sites – SSSI, SAC or SPA
- Local Nature Conservation Sites (LNCS)
- Peatland & Heathland Conservation & Restoration
- Peatland & Heathland Opportunity Network
- Grassland & Open Mosaic Habitat (OMH) Conservation & Management
- Grassland & Open Mosaic Habitat (OMH) Opportunity Network
- Rivers & Wetland Conservation & Management
- Rivers & Wetland Opportunity Network
- Intertidal Conservation
- Intertidal Opportunity Network
- Woodland Conservation & Management
- Woodland Opportunity Network
- Urban Opportunity Area

It was also agreed that the map should be accompanied by a guidance note that fully described each layer and the following terms:

- *Conservation and Management*: Areas of existing habitat that the Pilot defined as important to protect for one of the following key habitat types identified within the Inner Forth: Woodland; Grassland and Open Mosaic Habitat or Rivers and Wetland.
- *Conservation and Restoration*: Areas of existing habitat that the Pilot defined as important to protect for one of the following key habitat types identified within the Inner Forth: Peatland and Heathland or Intertidal.
- *Opportunity Network*: Areas where the Pilot identified most opportunity to create or enhance one of the five key habitat types within the Inner Forth, either: Woodland; Grassland and Open Mosaic Habitat; Peatland and Heathland; Intertidal; or River and Wetland. These may not show functional habitat connectivity or modelled habitat integration.

3.3.2 A Collective Approach

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

3.3.3 Refining the Ecological Coherence Protocol

To refine the ecological coherence protocol itself for future use, the Pilot sought feedback from participants focused on 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).

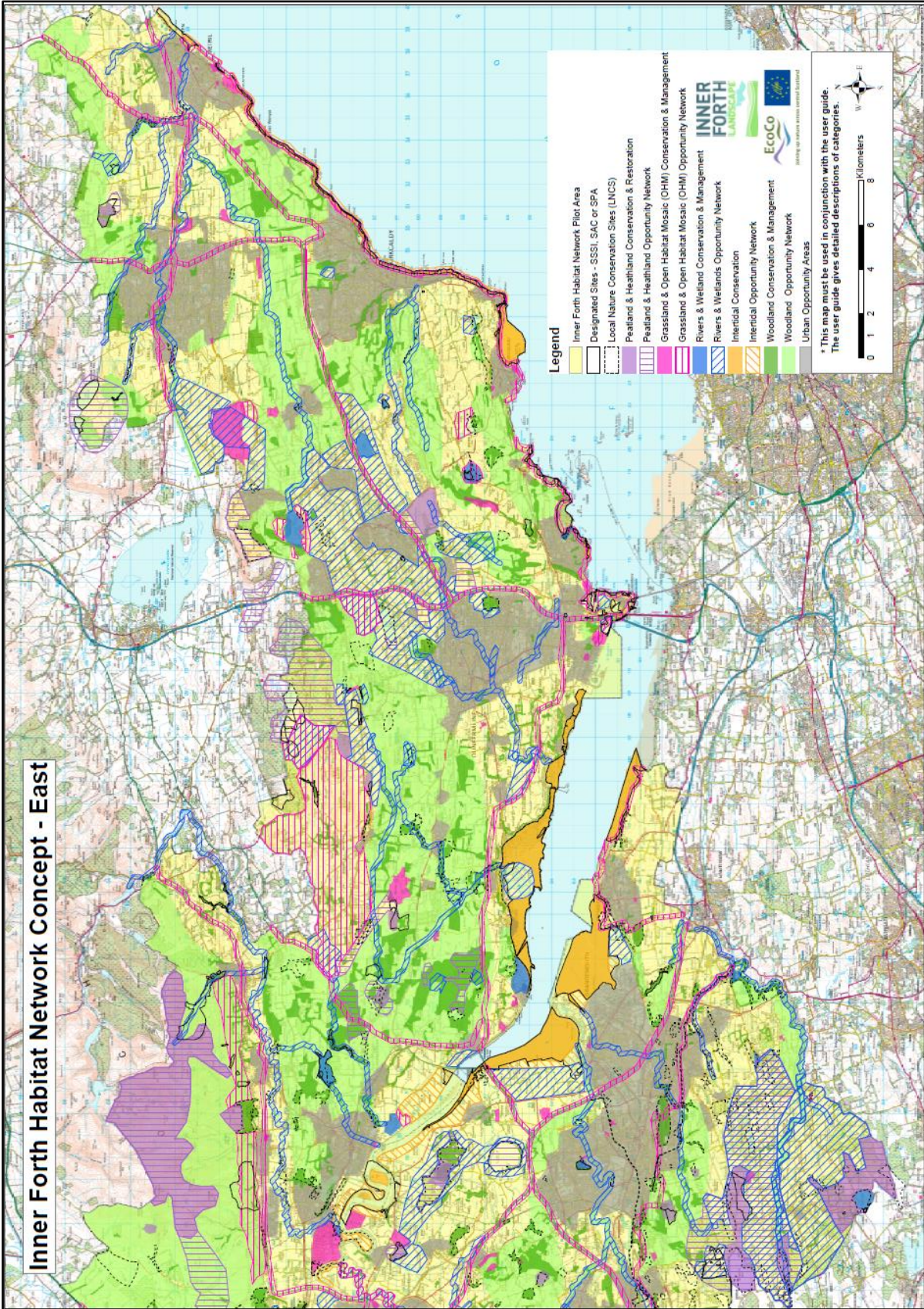
These findings were used to help develop *Ecological Coherence: A Practitioners' Guide*, a printed and online document that was developed to showcase the approach and guide potential users through each stage. The *Guide* uses the Inner Forth Pilot as a case study.

3.4 Outputs

By applying the EcoCo ecological coherence protocol, the Pilot assisted in its review and revision which has resulted in *Ecological Coherence: A Practitioners' Guide*.

The Pilot produced a mapped concept of an Inner Forth Habitat Network (Figure 11 and Figure 12) that is accompanied by a user guide (Appendix 2) and a draft call-to-action (Appendix 3) that describes how, where and when the concept could be delivered on the ground. The draft call-to-action will be further reviewed and revised by the IFF team and members of an expanded Inner Forth Natural Heritage Working Group.

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



Inner Forth Habitat Network Concept - East

Figure 11 Inner Forth Habitat Network Concept Map (East).

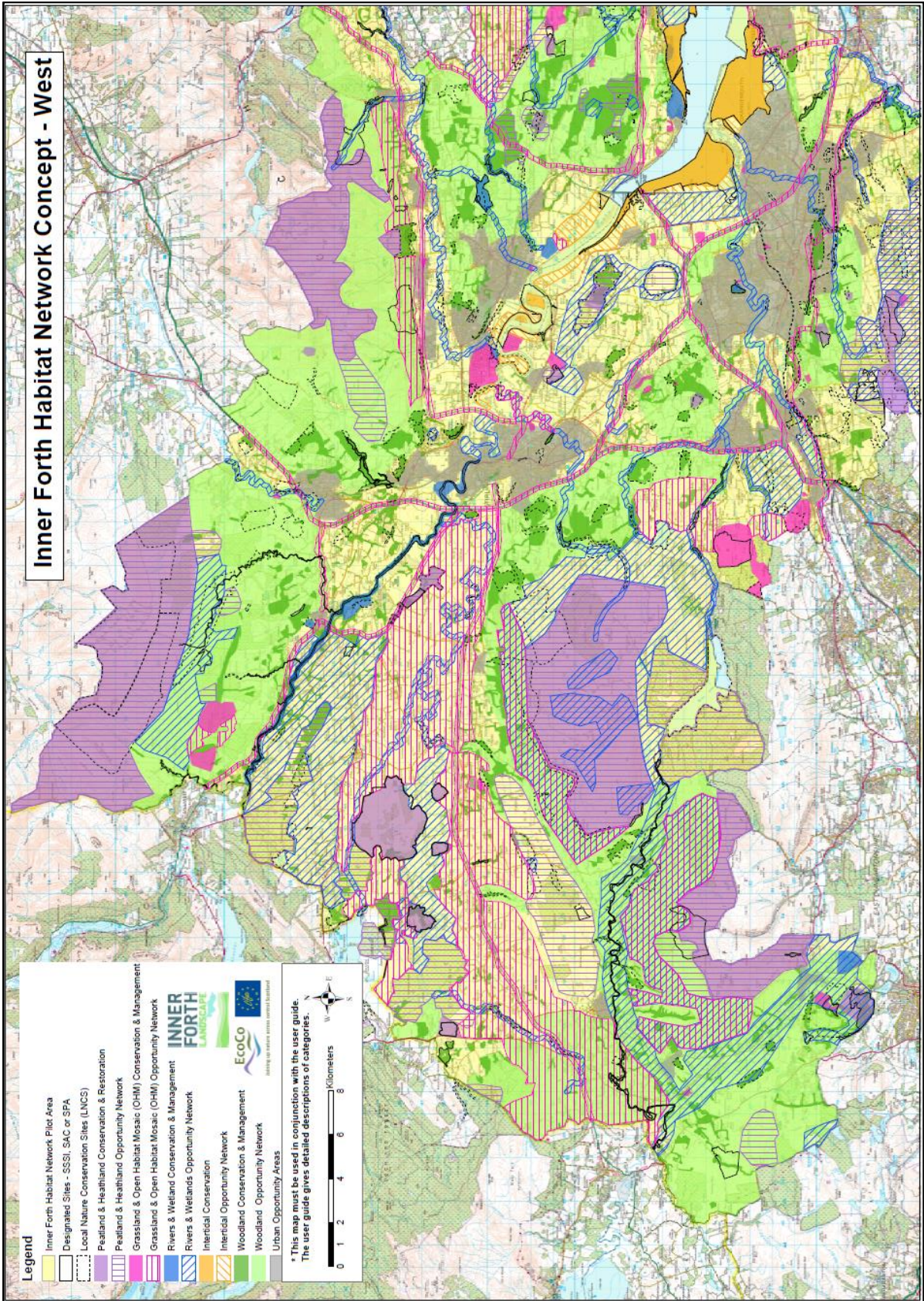


Figure 12 Inner Forth Habitat Network Concept Map (West).

4. Future Work Implementing the Inner Forth Habitat Network Concept

Participants in the Inner Forth Pilot identified a series of next steps (Figure 13 and Figure 14) to seek wider support for the mapped habitat network concept and to finalise the draft call to action (Appendices 2 and 3) to enable it to be embedded in CSGN plans. The initial stages of review and finalisation will be through a widened membership of the Inner Forth Natural Heritage Working Group (which met in March 2019 to start the process), but also the Scottish Biodiversity Strategy Landscape-Scale Conservation working group.

Outputs	Stakeholders & delivery
<ul style="list-style-type: none"> • Clarify the key and other accompanying text to ensure that the caveats make clear what the work is and is not. Include text on regulatory aspects. • Make the maps and key/accompanying text available as one pdf. 	<ul style="list-style-type: none"> • Share final maps, key/accompanying text and call to action with participants of the Pilot. • SGRPID to have access to maps and embed in plans (+ FCS). • Embed through CSGN and roll out. • Take the Pilot outputs to an IF NHWG with a widened membership. This will allow for review of outputs, review of progress and opportunities to develop projects. • Review in TBD months ie has it worked?

Figure 13 Agreed next steps following the Inner Forth Habitat Network Pilot

Seek buy-in of current Pilot outputs	Amend mapping, opportunities & barriers as required	Refine actions and projects	Identify which projects and/or actions to deliver and/or focus on and how
<ul style="list-style-type: none"> • Via an Inner Forth Natural Heritage Working Group with a widened membership. • Seek input/comments from other users ie FCS, Local Authorities. • Via the landscape scale working group. 	<ul style="list-style-type: none"> • Via an Inner Forth Natural Heritage Working Group with a widened membership. • Check of morphology (river and wetland). • As per arising comments from stakeholders. 	<ul style="list-style-type: none"> • Via an Inner Forth Natural Heritage Working Group with a widened membership. • Via other TBC groups and partnerships or delivery agencies. 	<ul style="list-style-type: none"> • Via an Inner Forth Natural Heritage Working Group with a widened membership. • Via other TBC groups and partnerships or delivery agencies.

Figure 14 How to take the outputs of the Inner Forth Habitat Network Pilot forward

There is a desire to continue working in partnership around the Inner Forth and to use the mapped output and call to action to identify future joint and organisational project delivery. The group that participated in the Pilot were clear that they had a continuing role in positively promoting the work of the Pilot and reviewing any action. The mapped concept will help the Scottish Biodiversity Strategy Landscape-Scale Conservation working group to define and illustrate how the National Ecological Network could be delivered at a regional level.

In March 2019 the Inner Forth Futures partnership (CSGNT, RSPB, Historic Environment Scotland, Falkirk Council, Stirling Council, Clackmannanshire Council, Fife Council, Sustrans and SNH) with members of the Natural Heritage Working Group (SEPA, Buglife Scotland, Scottish Wildlife Trust, River Forth Trust and Froglife) used elements of the mapped wetland concept to submit an

expression of interest and full application to the SNH Biodiversity Challenge Fund. If successful a 14 month multi-strand project will deliver wetland habitat creation, restoration and enhancement at key sites; training, citizen science and education work linked to Mud Snails; and employ three trainees to deliver project work and further development of the Habitat Network Concept in the Inner Forth.

It is anticipated that further additional funding to deliver aspects of the concept will be sought by a partnership or individual stakeholders in the coming years.

5. Acknowledgements

Inner Forth Futures would like to thank Scottish Natural Heritage (SNH) and the EcoCoLife project of the EU LIFE programme for their kind support and funding of the Inner Forth Habitat Network Pilot. Thanks also go to SNH, The Wildlife Information Centre and the local authorities that helped provide data for the mapping exercises, RSPB for mapping services and to everyone who attended the workshops and has been involved with the project.

Practitioners from the following organisations contributed to co-designing and discussing the Inner Forth Habitat Network and associated ambitions following the process outlined in *Ecological Coherence: A Practitioners' Guide* (available separately): Buglife Scotland, Central Scotland Green Network Trust, Clackmannanshire Council, Falkirk Council, Fife Council, Forth Rivers Trust, Froglife, Inner Forth Futures, Plantlife, RSPB Scotland, Scottish Environment Protection Agency, Scottish Natural Heritage, Scottish Wildlife Trust, Stirling Council, The Wildlife Information Centre, Woodland Trust.

Appendix 1: Data Sources

1.1 Habitat Types Data Sources

Ancient Woodland Inventory, SNH, <https://gateway.snh.gov.uk/natural-spaces/index.jsp>

Carbon and Peatland Map, SNH, <https://gateway.snh.gov.uk/natural-spaces/index.jsp>

CSGN Integrated Habitat Networks, SNH, <https://gateway.snh.gov.uk/natural-spaces/index.jsp>

Habitat Map of Scotland, SNH, <https://gateway.snh.gov.uk/natural-spaces/index.jsp>

Integrated Habitat Network: Falkirk, Stirling and Clackmannanshire local authority areas, The Wildlife Information Service.

Integrated Habitat Network: Fife, Fife Nature.

Open Mosaic Habitat, Buglife Scotland

Wetland Inventory, SEPA, <https://www.sepa.org.uk/environment/environmental-data/> *Background data and additional information that sits alongside the SEPA Wetland Inventory could be used to inform future use of the Pilot's outputs within the Inner Forth area as well as other collaborative exercises to use the Ecological Coherence Protocol in other areas throughout Scotland.*

1.2 Ecosystem Services Data Sources

Air Quality, Air Quality in Scotland, <http://www.scottishairquality.scot/data/>

Flood Hazard and Risk Maps, SEPA, <https://www.sepa.org.uk/environment/environmental-data/>

Scottish index of Multiple Deprivation (SIMD), Scottish Index of Multiple Deprivation. Copyright Scottish Government, contains Ordnance Survey data © Crown copyright and database right (2016) www.data.gov.uk

Land capability for agriculture: <http://soils.environment.gov.scot/>

Various ecosystem services datasets (agricultural services benefits and provision, kayak services provision, sewage disposal benefits and provision, hydrology services benefit and provision, drinking water service benefit and provision), prepared in 2014 as part of SEPA's submission to the EU for Article 5 of the Water Framework Directive: Economic Characterisation.

1.3 Other Data Sources

CSGN B-Lines, Buglife Scotland, <https://www.buglife.org.uk/b-lines-hub>

CSGN Boundary, CSGNT, <http://www.centralscotlandgreennetwork.org/resources/data>

Local Nature Conservation Sites: Falkirk, Stirling and Clackmannanshire local authority areas, The Wildlife Information Service.




Local Nature Conservation Sites: Fife, Fife Nature.

Sites of Special Scientific Interest, SNH, <https://gateway.snh.gov.uk/natural-spaces/index.jsp>

Special Areas of Conservation, SNH, <https://gateway.snh.gov.uk/natural-spaces/index.jsp>

Special Protection Areas, SNH, <https://gateway.snh.gov.uk/natural-spaces/index.jsp>

Appendix 2: Inner Forth Habitat Network Concept Maps User Guide

Inner Forth Habitat Network Concept Maps (East & West) User Guide





March 2019

When using the Inner Forth Habitat Network Concept Maps (East & West) to inform your work, plan or allocate resources, a further detailed assessment or ground-truthing of each site and the impacts of proposed changes should be undertaken with reference to additional, up-to-date habitat, protected area and land-use data sources.












The Inner Forth Habitat Network Concept Maps (East & West) were produced through the Inner Forth Habitat Network Pilot (2018) as a guide to inform future decision making in the Central Scotland Green Network (CSGN) areas of Stirling, Clackmannanshire, Falkirk and Fife. The Pilot followed an integrated ecological coherence approach to identify the best places within the area to carry out management interventions (habitat creation and/or enhancements) to maximise ecological, ecosystem services and socio-economic benefits whilst also considering practical constraints and opportunities. The concept maps express collaboratively agreed priorities based on these benefits. They do not indicate a desire to create habitat types in any given area and do not preclude other habitat enhancement works taking place. *Ecological Coherence: A Practitioners' Guide*, outlines the approach: <http://www.ecocolife.scot/> & www.innerforthlandscape.co.uk

Glossary

- Conservation and Management:** Areas of existing habitat that the Pilot defined as important to protect for one of the following key habitat types identified within the Inner Forth: Woodland; Grassland and Open Mosaic Habitat or Rivers and Wetland.
- Conservation and Restoration:** Areas of existing habitat that the Pilot defined as important to protect for one of the following key habitat types identified within the Inner Forth: Peatland and Heathland or Intertidal.
- Opportunity Network:** Areas where the Pilot identified most opportunity to create or enhance one of the five key habitat types within the Inner Forth: Woodland; Grassland and Open Mosaic Habitat; Peatland and Heathland; Intertidal; or River and Wetland. These may not show functional habitat connectivity or modelled habitat integration.

Layer Name	Data Source	Description of the Layer
Inner Forth Habitat Network Pilot 	The Pilot extended over four local authorities within the Central Scotland Green Network (CSGN): Stirling, Clackmannanshire, Falkirk and Fife. <i>NB the Pilot and CSGN areas do not include Loch Lomond and Trossachs National Park or eastern Fife.</i>	The section of the CSGN area considered as part of the Pilot. The landscape supports a range of land uses and habitats that offer diverse and complementary opportunities to enhance the coherence of the overall habitat network. Through the Pilot, places were identified as important for conservation (land management or restoration) or as having opportunities to develop networks for: Woodland; Grassland and Open Mosaic Habitat; Peatland and Heathland; Intertidal; or Rivers and Wetland. In addition, there will exist a range of ways to enhance the coherence of the habitat network across the Pilot area. These are not mapped and will additionally exist within the 'blank' sections of the map. Depending on existing land use, opportunities will include but are not limited to: <ul style="list-style-type: none"> • Green roofs and green walls. • Trees, hedgerows and orchards. • Wildflower meadows, bee and beetle banks and field margins. • Wild bird cover. • SUDS, raingardens, ponds, riparian buffer strips. • Wildlife friendly management of communications network buffer strips.
Designated sites – SSSI, SAC or SPA 	Scottish Natural Heritage (SNH)	Sites within the Pilot area designated for protection at a national or international level: <ul style="list-style-type: none"> • Sites of Special Scientific Interest (SSSI) are areas of land and water considered to best represent our natural heritage in terms of flora, fauna, geology, geomorphology or a mixture of these natural features. SSSI is a statutory designation made by SNH under the Nature Conservation (Scotland) Act 2004. • Special Areas of Conservation (SAC) are designated under the EU Habitats Directive for habitats and non-bird species. • Special Protection Areas (SPA) are classified under the EU Birds Directive to protect birds that are rare or vulnerable in Europe as well as all migratory birds that are regular visitors. SACs and SPAs are part of the Natura 2000 network of nature conservation sites across Europe. In Scotland these sites are given legal protection by the Habitats Regulations. (source: www.nature.scot)
Local Nature Conservation Sites (LNCS) 	Local authority specific data from Stirling Council, Falkirk Council, Fife Nature Records Centre and The Wildlife Information Centre (Clackmannanshire area data).	Local Nature Conservation Sites (LNCS) identify locally important natural heritage that could be damaged by development. Types of LNCS include <ul style="list-style-type: none"> • Listed wildlife site (LWS) • Site of Importance for Nature Conservation (SINC) • Local Geodiversity Site (LGS) – also known as Regionally Important Geological Site (RIGS) The designation signals to planners and developers where there are natural features of some merit. For specific details of each LNCS site shown on this map, how sites have been identified and proposed, or how sites are considered in the planning process, please contact the relevant local authority. (source: www.nature.scot)
Peatland & Heathland Conservation and Restoration 	SNH Carbon and Peatland map with additions from Pilot workshop attendees.	Places where the conservation, restoration and management of existing peatland or heathland is the priority for the coherence of the habitat network.

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	Peatland & Heathland Opportunity Network	Participation from Pilot workshop attendees.	Places where opportunities for enhancement, of peatland and heathland should be prioritised for the coherence of the habitat network.
	Grassland & Open Mosaic Habitat (OMH) Conservation and Management	Grassland Integrated Habitat Network layer from local authorities plus OMH sites from Buglife with additions from Pilot workshops attendees.	Places where conservation and management of existing grassland, unimproved grassland or OMH is the priority for the coherence of the habitat network. <ul style="list-style-type: none"> Open Mosaic Habitats on Previously Developed Land (OMH) is a UKBAP Priority Habitat that represents a diverse range of sites, largely because of the range of previous land uses associated with the sites, which include coal mining, industry and housing. OMH is concentrated in, but not confined to, urban and former industrial landscapes. The habitat supports many species and some habitat types that are a priority for nature conservation, such as pioneer communities and flower-rich grasslands. The areas have been described as important habitats for many UK Biodiversity Action Plan (BAP) priority species or Red Data Book/List species. Places where opportunities for creation and enhancement of grassland, unimproved grassland and OMH (including wildflower meadows or strips) should be prioritised for the coherence of the habitat network. <ul style="list-style-type: none"> See above for a description of OMH.
	Grassland & Open Mosaic Habitat (OMH) Opportunity Network	Participation from Pilot workshop attendees.	
	Rivers & Wetland Conservation and Management	Integrated Habitat Network layer from local authorities with additions from SEPA prioritised action mapping and Pilot workshop attendees.	Places where the conservation and management of existing river and wetland habitats (including pond, lake, fen, marsh) is the priority for the coherence of the habitat network.
	Rivers & Wetland Opportunity Network	Participation from Pilot workshop attendees.	Places where opportunities for creation and enhancement of riparian and wetland habitats (including pond, lake, fen and marsh) should be prioritised for the coherence of the habitat network.
	Intertidal Conservation	Integrated Habitat Network layer from local authorities with additions from SEPA prioritised action mapping and Pilot workshop attendees.	Places where the conservation of existing intertidal habitat is the priority for the coherence of the habitat network.
	Intertidal Opportunity Network	Participation from Pilot workshop attendees.	Places where opportunities for creation of intertidal habitat should be prioritised for the coherence of the habitat network.
	Woodland Conservation and Management	Ancient Woodland Inventory with additions from Pilot workshop attendees.	Places where conservation and management of existing broadleaved woodland is the priority for the coherence of the habitat network.
	Woodland Opportunity Network	Participation from Pilot workshop attendees.	Places where opportunities for creation and enhancement of broadleaved woodland (this includes hedgerows, orchards and trees) should be prioritised for the coherence of the habitat network.
	Urban Opportunity Areas	Desk based exercise of identifying conurbations shown on a 1:50000 OS map.	Built-up areas where there are a range of opportunities to enhance the ecological coherence of the habitat network and deliver benefits for people and wildlife through collaboration with local authorities, businesses, developers, schools, communities and householders. Opportunities include but should not be limited to: <ul style="list-style-type: none"> Green roofs and green walls. Street trees, hedgerows and urban orchards. Wildflower planting at a range of scales. SUDS, rain gardens and ponds. Wildlife friendly management of verges, gardens and greenspaces.
	Acknowledgements		The Inner Forth Habitat Network Pilot was supported by the LIFE financial instrument of the European Community and delivered as part of the EcoCo LIFE project: LIFE13 BIO/UK/000428 between October and December 2018. Practitioners from the following organisations contributed to co-designing, mapping and discussing the Inner Forth Habitat Network Concept and associated ambitions following the approach outlined in <i>Ecological Coherence: A Practitioners' Guide</i> (available to download from the EcoCo and Inner Forth Futures website): Buglife Scotland, Central Scotland Green Network Trust, Clackmannanshire Council, Falkirk Council, Forth Rivers Trust, Froglife, Inner Forth Futures, Plantlife, RSPB Scotland, Scottish Environment Protection Agency, Scottish Natural Heritage, Scottish Wildlife Trust, Stirling Council, The Wildlife Information Centre, Woodland Trust.

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Appendix 3: Draft Inner Forth Habitat Network Concept Call to Action

This document is at a DRAFT stage and it is anticipated that amendments will be made in the coming months as it goes through a review process that will include input from wider stakeholders.

Inner Forth Key Habitat Type: Peatland & Heathland				
Peatland & Heathland Conservation and Restoration: <i>Places where the conservation, restoration and management of existing peatland or heathland is the priority for the coherence of the habitat network.</i>				
Peatland & Heathland Opportunity Network: <i>Places where opportunities for enhancement, of peatland and heathland should be prioritised for the coherence of the habitat network.</i>				
Opportunity Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Delivery of peatland / raised bog restoration on the ground	Peatland /raised bog restoration undertaken, specifically at: <ul style="list-style-type: none"> • West Flanders • Letham Moss • Dunmore Moss • Slamannan Plateau • Ochils • Wester Moss 	Landowners / managers, SNH, NGO's, community and local authorities.		
	Influencing landowners and managers to apply for Peatland Action funding either solely or in partnership with neighbouring landowners and managers.	SNH? (PA team), IFF partnership		
	Coordinated planning and delivery for sites such as the Ochils that have 3 local authorities within the LMP but can be considered as one landscape and habitat.	This partnership?		Project
Education and awareness raising of restoration and management on the ground	Persuade landowners to apply for Peatland Action in the Ochils with coordinated applications and management plan	This partnership?		Project
	Share lessons learned of Falkirk bog restoration on the Slamannan Plateau for Bean Geese.	Falkirk Council	Medium term	
Species	Black Grouse <ul style="list-style-type: none"> • New records at Denny Muir • Callendar BG Project 			
?	Better payments in agri-environment scheme	SGRPID		
Catalyse landscape scale approach	Undertake work to: <ul style="list-style-type: none"> • Understand risks and opportunities • Survey opportunities • Make findings available to advisors 	SNH? This partnership?		

Inner Forth Key Habitat Type: Grassland and Open Mosaic Habitat

Grassland & Open Mosaic Habitat (OMH) Conservation and Management: Places where conservation and management of existing grassland, unimproved grassland or OMH is the priority for the coherence of the habitat network. Open Mosaic Habitats on Previously Developed Land (OMH) is a UKBAP Priority Habitat that represents a diverse range of sites, largely because of the range of previous land uses associated with the sites, which include coal mining, industry and housing. OMH is concentrated in, but not confined to, urban and former industrial landscapes. The habitat supports many species and some habitat types that are a priority for nature conservation, such as pioneer communities and flower-rich grasslands. The areas have been described as important habitats for many UK BAP priority species or Red Data Book/List species

Grassland & Open Mosaic Habitat (OMH) Opportunity Network: Places where opportunities for creation and enhancement of grassland, unimproved grassland and OMH (including wildflower meadows or strips) should be prioritised for the coherence of the habitat network. See above for a description of OMH.

Opportunity Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Biodiversity rich grassland creation and management	Manage grasslands on island fields at Gartmorn Dam (link to SEPA morphological failure priority)	Council owned Community / friends of group SNH	Short term	Site
	John Muir Pollinator Way & elsewhere <ul style="list-style-type: none"> Deliver programme for government targets Delivery opportunities and long term management Deliver 'on the verge' / on verges 	Fife Council Falkirk Council Stirling Council Clackmannanshire Council Stakeholders NGOs Community groups	Short to medium term	Project Site
	Expand 'On the Verge' concept as adopted by Stirling Council, to convert more areas of amenity grassland to wildflower rich habitat.			
	B-lines habitat creation and priority routes, across the whole Pilot area.			
	Enhance species rich grassland sites, particularly those with key species such as globeflower in Fife.			
	Management of road verges and urban corridors and motorways Local authority /roads agencies could be approached to manage more appropriately eg cutting regimes			
Biodiverse rich OMH creation and management	Management of existing OMH sites for wildlife (eg formalising footpaths to protect habitats)	Land owners / managers SNH Communities NGOs	Short term	Project Site
	Ground-truthing of vacant and derelict land and identifying those important			

	for wildlife. Aim to protect those sites that are good for wildlife and remove them from SVDL.			
	Open Mosaic Habitat – survey sites identified as potential for OMH ground truthing and reviewing fact-finding.			
	Vacant and derelict land sites targeted for invertebrate and pollinator friendly management & Enhancement of OMH / brownfield stepping stones in urban areas.			
	Gartmorn dam management	Council owned Community / friends of group SNH	Short term	Site
	Valleyfield Ash Lagoons – input to restoration plan	Scottish Power Fife Council Local stakeholders SNH	Short term	Site
	Longannet Ash Lagoons – protect and improve via the planning process	Scottish Power Fife Council Longannet Taks Force SNH	Medium term	Strategic Planning Organisational
Restoration of Kinneil landfill to create habitat.	Kinneil Landfill – sign off ‘good’ restoration plan	SEPA Falkirk Council Stakeholders	Short to medium term	Organisational Site
Influencing the planning system	Identify barriers to meadow creation and management with Local Authorities and landowners	Local Authorities Stakeholders	Short term	Organisational
	Scottish Government to push / support Local Authorities on biodiversity duty / Scottish Pollinator Strategy	Scottish Government SNH	Short term	Strategic Planning
Local Authority open space management &/ Management of road verges and urban corridors and motorways	Encourage agencies to manage these spaces more appropriately eg cutting regimes	Local Authorities Scottish Government eg Amq?	Short to medium term	Strategic Planning

Inner Forth Key Habitat Type: Rivers & Wetland

Rivers & Wetland Conservation and Management: Places where the conservation and management of existing river and wetland habitats (including pond, lake, fen, marsh) is the priority for the coherence of the habitat network.

Rivers & Wetland Opportunity Network: Places where opportunities for creation and enhancement of riparian and wetland habitats (including pond, lake, fen and marsh) should be prioritised for the coherence of the habitat network.

Opportunity Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Reduce impact of INNS in rivers and waterbodies by taking an integrated catchment approach.	Raise awareness of INNS by promoting the 'Check, Clean, Dry' campaign.	Water users SEPA Marine Scotland Scottish Canals	Short term	Community
	Update and fund implementation of the Forth biosecurity plan with Project Officer to co-ordinate.	Forth Fisheries Trust SNH SEPA Scottish Canals	Medium term	Strategic planning
	Demonstrate an integrated catchment approach: <ul style="list-style-type: none"> • Allan Water project • River Almond and Avon Project 	FFT FFT	Short Short	Project
Deliver In stream habitat improvements to beds banks and shores.	River Restoration <ul style="list-style-type: none"> • Mains Burn • Grange • River Carron • Auchenbowie • Allan • Goodie • Brollie • Gartmorn • Lochs & Trac 			
	Green banking			
	Large woody debris <ul style="list-style-type: none"> • Upper Avon • Upper Devon • Black Devon 			
Deliver Riparian habitat improvements	Riparian tree planting along all rivers	work with landowners		
	Wetland habitat connectivity at Aberdour burn			
	Focus on areas with diffuse pollution issues	SEPA		
Improve river connectivity through the catchment	Ensure barrier removal or mitigation is delivered through Port of Menteith.	SEPA + Stakeholders	Medium term	Strategic Planning
	North Third Reservoir (wall/barrier)			
	Barrier at River Avon at Westfield			

	Allan Water barriers (A9 culverts)			
	River Leven barriers (6 weirs) – potential to be delivered through Fife Council & SEPA as part of the River Leven project.			
	Loch Ore culvert and inlet			
	Upper Avon (moving embankments or breaching)			
	Upper Allan Water (moving embankments or breaching)			
	Leven / Ore (moving embankments or breaching)			
	Canalised section of rivers to reconnect them to the floodplain			
	Improve connectivity at Lake of Menteith (screen)			
	Scope opportunities for improving connectivity at Gartmorn Dam (link to SEPA morphological failure priority)			
Deliver wetland management and enhancement across the landscape and at key sites.	Secure funding for small-scale intervention as part of agri-environment.	SGRPID SNH Scottish Government	Medium to Long term	Strategic planning
	Longannet			
	Kincardine			
	Valleyfield	Fife, SP, SNH, SEPA, RSPB	Short	
	Open cast sites			
	Kildean (Stirling)			
	Slamannan Plateau (to help link peatland - bog- fen)			
Improve quality and quantity of ponds across the landscape.	Habitat management plan for Bean geese – rush management and reseedling	SNH SGRPID	Medium term	Site
	Surveys of ponds / wetlands for invertebrates and other wildlife in the aim to protect those sites that are important (eg Pond Mud Snail sites in Falkirk)	Froglife? This partnership?	Short term	Site
	Plan of specific pond project sites.			
	Creation of offline ponds for flood attenuation and other species.			
	Make Sustainable Urban Drainage Systems (SUDS) wildlife friendly.	Local Authorities	Medium term	Organisational
	Additional freshwater ponds suitable for Great Crested Newts. Extending populations			

	and facilitating movements for Avonglen Quarry and Muiravonside Country Park.			
	Great Crested Newt pond enhancement – linked to wide wetland network creation.			
Benefit priority wetland and riparian species	Beavers: Introduce them and allow them in Expanding range and public perception			
	Increase water vole populations: Upper Avon Across the Forth			
	Identify isolated reptile populations from species records and linking habitat together. Location dependent on records.			

Inner Forth Key Habitat Type: Intertidal

Intertidal Conservation: Places where the conservation of existing intertidal habitat is the priority for the coherence of the habitat network.

Intertidal Opportunity Network: Places where opportunities for creation of intertidal habitat should be prioritised for the coherence of the habitat network.

Opportunity Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Promote and encourage managed realignment as a technique with multiple benefits	Integrated working on land/sea interface at an operational level.	Marine Scotland SEPA	Short term	Operational
	Targeted funding for intertidal creation / restoration	Marine Scotland Scottish Government	Medium term	Strategic Planning
	Champion / advocate in Scottish Government	Scottish Government Marine Scotland NGOs Inner Forth Board	Short term	Strategic Planning
	Develop Programme of Measures (RBMP) & classification	SEPA Marine Scotland AAG	Medium term	Operational
	Include in / integrate with FRMP / Flood Alleviation Plans / Local Flood Plans	Local Authorities Stakeholders	Short term	Strategic Planning
Demonstrate managed realignment in the Inner Forth, specifically at Inch of Ferryton	Rework / Review Inch of Ferryton costs	RSPB	Short term	Project
	Secure funding for Inch of Ferryton			
	The Haughs and Rinds	RSPB	Short term	Project

Deliver intertidal habitat enhancement		SWT		
	Alloa Inch and Tullibody Inch (and/or other islands)			
	Bandeath (low-lying eastern side, approx. 30ha)			
	Brackish pools at Black Devon			
	Bothkennar saline lagoons and reedbed			
	Narrow strips as the Forth flows through Stirling (linked to Vision for Stirling River Park)			
	Include as mitigation within Grangemouth and include restoration figures	SNH Falkirk Council RSPB SEPA	Short term	Project
Species	Explore Tern spp resting site enhancement.			
	Understanding intertidal zone on sea trout.			
	Eel, lamprey, sea trout and sparling research	FFT, MS	Short term	
	Salmon movement monitoring – funded by offshore windfarms	FFT		

Inner Forth Key Habitat Type: Woodland

Woodland Conservation and Management: *Places where conservation and management of existing broadleaved woodland is the priority for the coherence of the habitat network.*

Woodland Opportunity Network: *Places where opportunities for creation and enhancement of broadleaved woodland (this includes hedgerows, orchards and trees) should be prioritised for the coherence of the habitat network.*

Opportunity Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Species	Check barn owl coverage of the area. Potential to expand (populations across the area) <ul style="list-style-type: none"> Raptor opportunities & data to inform Building capacity – advise and do work 	Central Scotland Raptor Study Group (CSRSG), Local Authorities		
	Deer management -Local Authority Deer Management Plans? -Lowland Deer Management Groups	SNH		
Community woodlands	Identify ways to support small community groups / volunteer management			

	Community Forest Agents?		?	
	Raising awareness, informing, influencing Forest and Woodland systems, Woodland Trust / groups etc	Inner Forth Futures partners		
	Promote existing Forestry Grant Schemes eg CSGN Woodland top up grant	Forestry Commission Scotland CSGNT NGOs Land managers and owners	Short term	Organisational
National target to increase woodland cover & national / regional forest strategies	Woodland management and expansion in the Inner Forth, specifically at: <ul style="list-style-type: none"> • South Falkirk woodland • River Avon corridor • River Carron corridor • North Falkirk / Denny • Kildean and Borrowmeadow loops (Stirling area) 			
	Speak to Forestry Commission Scotland	Inner Forth Futures partners		
	Identify groups and organisations working in expansion / management areas to find out what is already happening / emerging opportunities	Forestry Commission Scotland CSGNT NGOs Land managers and owners	Short term	Organisational
	Green the Grey' – street tree planting. Make the most of community interest. '			
	Woodland restoration across the Pilot areas. PAWS and Native / nearly native sites which require intervention to improve.			
	?	Changes to rural boundary features in rural areas		
Urban woodland enhancement, creation and management.	Urban green infrastructure network in urban areas, combining hedgerows and trees within the grassland network (results will be whatever is appropriate / feasible)			
	Speaking to Green Infrastructure Teams in Local Authorities <ul style="list-style-type: none"> • connecting with wider landscape, native trees. 			

Inner Forth Key Habitat Type: Urban

Developing and delivering multifunctional green infrastructure throughout built up areas to enhance the ecological coherence of the habitat network and deliver benefits for people and wildlife through collaboration with local authorities, businesses, developers, schools, communities and householders.

Opportunities include but should not limited to:

- *Biodiverse / pollinator friendly green roofs and green walls.*
- *Street trees, hedgerows and urban orchards.*
- *Wildflower planting at a range of scales.*
- *SUDS, raingardens and ponds.*
- *Wildlife friendly management of verges, gardens and greenspaces.*

Opportunities Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Influencing the planning system	Green Infrastructure <ul style="list-style-type: none"> • Planning / strengthening Scottish Planning Policy with 'will' 	Scottish Government, CSGNT, Scottish Water, SEPA.	Short term	Strategic
	Green Infrastructure (GI) and Sustainable Urban Drainage Systems (SUDS) – open space strategy, local place plan, local development plan, include green infrastructure	Local Authorities, Stakeholders	Short term	Strategic
Delivery of green networks on the ground	Implementation of Green Infrastructure – do it! <ul style="list-style-type: none"> • Developers in their plans & delivering it • local plans • retro fitting – social housing / others 	Housing developers, Planners, Local Authorities	Short to medium term	Organisational
	Implementation of GI through other processes including retro-fitting (is there a better way of wording this).	community	Short term	project
	Connected urban habitats by promoting wildlife gardening, permeable gardens etc.	NGO, community	Short to medium term	project
	Green bridges across barrier roads and motorways.	Transport Scotland	long term	strategic
	Appropriate monitoring of multifunctional GI that feeds back into the planning system	Local Authorities, NGO, community	Long-term	Project and site based.
	Getting urban green spaces into good management	Altered management of urban greenspaces to benefit pollinators and other wildlife.	Scottish Government, CSGNT, Local Authorities	Long-term
Appropriate management of GI and SUDS for wildlife and people		Local Authorities, Scottish Water	Short term (but repeated, so should this be long term?)	Organisational
Street trees – proving the case of urban green infrastructure		Local Authorities,	Short term	Strategic Planning

	for urban heat effect, air pollution etc	Scottish Government, CSGNT		
Education and awareness raising of multifunctional green spaces	Identify and Designation of Urban National Nature Reserves.	SNH	Short term	Organisational
	Develop and deliver sensible management plans of urban National Nature Reserves (once designated)	Land managers and/or owners, SNH	Medium term	Organisational Site / Project

Other Inner Forth Habitat Type: Agricultural

Other Inner Forth Habitat Type: Agricultural				
Opportunity Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Education and awareness raising of the ecological coherence approach and habitat networks	Contact existing groups to present Habitat Network Pilot work and promote a bottom up approach to delivery <ul style="list-style-type: none"> • Carse of Stirling partnership • Lake of Menteith community group • Allanwater Improvement Project • Upper Avon Riparian Project 	SNH (Neville Makan) SNH (Henry Lima) Forth Rivers Trust Forth Rivers Trust	For all: Contact is short term. Involvement is long term.	project
	Identify other groups that may be interested eg DMG's	Inner Forth Futures partners		
	Use to inform SEPA permits for human and animal slurry and pot... [?] spreading. Links to 'Compliance and Beyond' wording.	SEPA		
Support demonstration / model farms	Establish volunteer group?	Native Friendly Farming Network NGO support	Contact is short term.	
	Carse farmland enhancements eg wetland creation, appropriate boundary features.			
	Open mosaic habitats including trees, woodlands, wood pastures, where appropriate - Endrick River.			

<p>Results of Brexit eg</p> <ul style="list-style-type: none"> • Low grade agri-land affected by Brexit could provide opportunities for land acquisition or be a driver for a change in management. • Farm payments prioritised for habitat creation or sites protection eg hedgerow creation, arable field margins, wetland protections, pond creation. 	<p>Influencing post-Brexit agri-environment</p> <ul style="list-style-type: none"> • strong advisory service • raising awareness with NFU, Soil Association etc 	<p>Inner Forth Futures partners</p>		
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Cross-Cutting (not habitat specific)				
Opportunity Identified	Action	Who is Responsible & can support?	Duration? *	Level? *
Positive management of LNCS	Resources for identifying, prioritising and managing Local Nature Conservation Sites (LNCS) - Also review LNCSs	Local Authorities Scottish Government SNH Landowners / managers	Medium term	Organisational
	Recognition of LNCS in agri-environment schemes	Landowners / managers Government SNH	Short term	Strategic
Education and awareness raising of the ecological coherence approach and habitat networks	Positive distribution of the Ecological Coherence Practitioners' Guide.	Inner Forth Futures partners Local Authorities, SNH, SEPA, NGOs	Short term	
	Sharing of stakeholder activities that are delivering the Habitat Network Concept via the Inner Forth Futures website (including an introductory explanation of the process)	Inner Forth Futures	Short term	project
	Visitor engagement – close to big town centres			
Delivery of the Habitat Network Concept at a landscape-scale	Inner Forth Futures partners work with others to identify work on the ground and a common vision to improve wider area / Partnership working to deliver opportunities on and between sites eg	Inner Forth Futures partners Local Authorities	Short term	Strategic / Organisational

	<ul style="list-style-type: none"> • Argarty • Forestry Commission Scotland • RSPB • Woodland Trust 			
	Landscape-scale partnership to link existing HLF funded landscape partnership schemes			Strategic / Organisational
	Find projects that help to unite the Councils to work together (Projects in development or delivery could help to deliver against themes and priorities eg Carse of Stirling Project, Strathard Ecosystem Project, Vision for Stirling River Park.	Local Authorities Stakeholders Government Others	Short term	Organisational
	Inner Forth National Nature Reserve	SNH, Local authorities, NGOs and landowners/managers	Long term	Strategic planning
	Site condition monitoring regularly occurring on all protected areas	SNH	Medium term	organisational

DRAFT

The Inner Forth Habitat Network Pilot was supported by the LIFE financial instrument of the European Community and delivered as part of the EcoCo LIFE project: LIFE13 BIO/UK/000428.