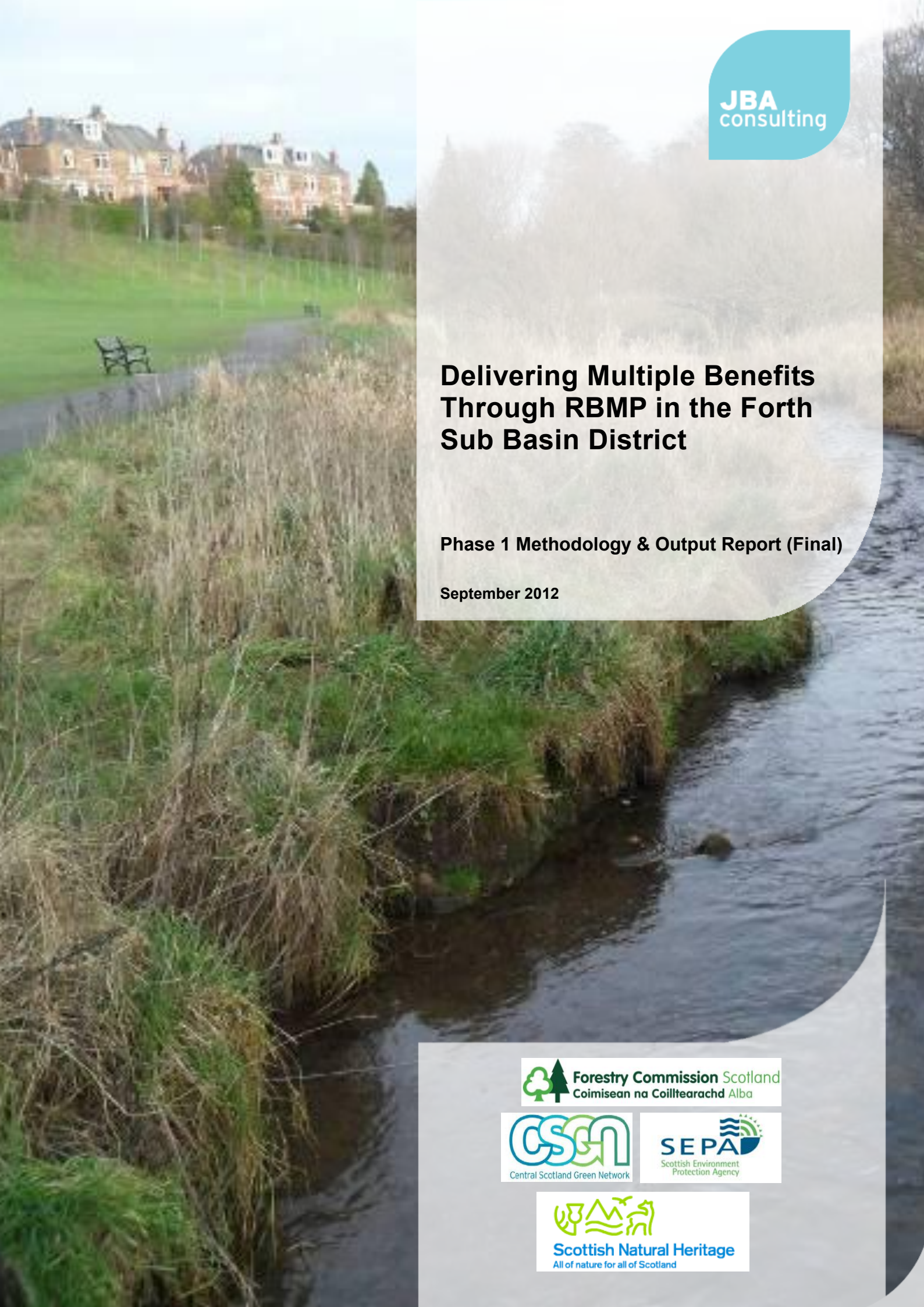

Delivering Multiple Benefits Through RBMP in the Forth Sub Basin District

Phase 1 Methodology & Output Report (Final)

September 2012

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Central Scotland Green Network

SEPA
Scottish Environment Protection Agency

Scottish Natural Heritage
All of nature for all of Scotland

JBA Project Manager

Caroline Anderton BSc MSc CEnv CSci MCIWEM C.WEM

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Contract

This report describes work commissioned by Central Scotland Green Networks, on behalf of SEPA, Forestry Commission Scotland, CSGN and SNH by a letter dated 16 May 2011. CSGN's representative for the contract was Emile Wadsworth. Caroline Anderton, David Bassett, Thomas Crow and George Heritage of JBA Consulting carried out this work.

Prepared by ..... Caroline Anderton BSc MSc CEnv CSci MCIWEM C.WEM

Principal Hydrologist

Prepared by ..... Thomas Crow BSc MSc

Analyst

Reviewed by ..... David Bassett BSc MSc CEnv MCIWEM C.WEM

Director

Purpose

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JBA Consulting has no liability regarding the use of this report except to CSGN.

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Executive Summary

JBA Consulting were commissioned by Forestry Commission Scotland, SEPA, SNH and the Central Scotland Green Network Support Unit to undertake an assessment of the Forth Sub-Basin District to assess and identify locations were multiple-benefits can best be achieved through improvements to the environment in particular through watercourse and floodplain restoration.

The River Basin Management Plans (RBMP) for Scotland recorded 56% of rivers as achieving 'good' status or better in 2009, with a target to increase this to 63% by 2015. Only 28% of water bodies are presently classified as being at good or high ecological status or potential within the Forth Sub Basin District which covers approximately 4800 km^2 in the highly populous central Scotland.

The RBMP aims to improve those water bodies with a target of 96% achieving good or high status or potential by 2027, the target is challenging. In order to meet the challenging timescales in the Forth Sub Basin a process to identify the multiple benefits to the environment and society has been followed. This has been undertaken to optimise the benefits from improvements and investment on diverse watercourse reaches within the Forth Sub Basin where addressing Water Framework Directive (WFD) pressures (morphology, urban diffuse pollution and rural diffuse pollution) should result in multiple benefits both to the environment and society. These benefits will be achieved through the joint consideration and management of habitat restoration and flood risk, thus helping to achieve international biodiversity targets, increasing environmental resilience to climate change and anthropogenic pressures.

This report presents the process followed in order to determine and prioritise multiple benefit opportunity areas:

- Step 1 - Data Collection
- Step 2 - Habitat Screening
- Step 3 - Opportunity Areas Screening
- Step 4a - Ranking using Multi-criteria analysis
- Step 4b - Aerial Photograph Analysis
- Step 5 - Adding Local Knowledge

This process identified 391 opportunity areas across the Sub Basin and these have been screened using GIS methodologies and ranked in terms of potential multiple benefits using a multi-criteria analysis. Initial outputs were presented to stakeholders during a workshop in August 2011 and local knowledge from this workshop was then fed back into the prioritisation process.

The output from this multi-criteria analysis resulted in four study reaches being selected from the ranked list and assessed further through detailed habitat and hydromorphological surveys. The restoration opportunities identified are presented within four separate watercourse reach reports, including the derivation of restoration plans to improve the water body WFD status for these defined opportunity areas and further prioritisation. The four sites were chosen by the steering group and Forth Area Advisory group to represent a diverse range of pressures and benefits.

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Abbreviations

CEH	Centre for Ecology and Hydrology
FMS	Flow measurement station
GIS	Geographical Information System
ID	Identifier
LA	Local Authority
LNR	Local Nature Reserve
MS	Microsoft
NNR	National Nature Reserve
NTS	Northern Telemetry System
OS	Ordnance Survey
RBMP	River Basin Management Plan
SAC	Special Area of Conservation, protected under the EU Habitats Directive
SAM	Scheduled Ancient Monument
SEPA	Scottish Environment Protection Agency
SINC	Site of Importance for Nature Conservation
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Urban Drainage Systems

1 Introduction

1.1 Background

The River Basin Management Plan for the Scotland River Basin District[1] reports 56% of rivers as achieving 'good' status or better, with a target of increasing this to 63% by 2015. In order to achieve this target efficiently a number of key responsible bodies are assessing how best to achieve wider environmental improvements. Benefits of a restored water environment include:

- Increased health & well being for communities
- Improved ecological status
- Climate change adaptation and mitigation
- Increased aesthetic and amenity value
- Attainment of biodiversity targets
- Increased habitat connectivity
- Reduced flooding and natural flood management

River restoration can have wide-ranging and diverse benefits including positive morphological, ecological, flood risk, socio-economic or recreational outcomes. Traditionally, river restoration has been undertaken in a fragmented manner. Projects have tended to be undertaken either to address a specific issue along a waterway, or a number of issues at a particular location. For instance, to enhance fish migration and improve aquatic ecology a project may look at the removal or modification of structures such as weirs or dams along the waterway. Alternatively, projects have been undertaken at a specific location. For example, a wetland restoration project may be designed to address a number of issues at a location such as diffuse sediment or nutrient pollution, lack of riparian vegetation, poor morphology, etc. While these approaches have often successfully addressed or improved specific or local issues, they have often had limited spatial or wide-ranging impacts.

Through multi criteria assessment it is hoped that the benefits of a more holistic planning process will realise more improvements in the Forth Basin with multiple benefits.

This task must be viewed in the context of a generally dynamic river network across Scotland where the geology, topography and climate has created a diversity of channel types ranging from confined bedrock influenced mountain torrents, through to braided, wandering and active / inactive meandering systems. Many of these types can be seen along a single river system as the relative importance of controlling catchment variables alters.

The widespread legacy of glaciation across Scotland also continues to influence channel morphology, with many rivers flowing over deep glacio-fluvial gravels and sands deposited by braided channels immediately following the last ice age. Subsequent isostatic rebound after the ice sheets melted, coupled with a reduction in sediment inputs from the deglaciated catchments (associated with catchment re-vegetation), resulted in extensive sediment reworking of valley floor deposits and floodplain incision, creating confined valleys and wider terrace sequences and exposing underlying bedrock to create local controls on subsequent deposition and river type.

More recently a milder climate has led to a reduction in geomorphic activity over periglacial rates and the development of wandering and sinuous single thread channels, changing in response to spate flows and remaining relatively stable at other times. Despite their generally less responsive nature they remain sensitive to local alterations to the flow and sediment regime linked to climate change and human activity. Catchment practices including forestry, livestock management, power generation, water abstraction, effluent discharge and land drainage continue to invoke a response from impacted rivers, which will vary according to river type. Similarly, direct intervention and alteration in the form of river training, flood alleviation works and bank protection invariably creates instability.

[1] Scottish Government. 2009. The river basin management plan for the Scotland river basin district 2009-2015. Scottish Government.

This level of reactivity and responsiveness to local and catchment wide alterations presents significant challenges to river restoration, with physical change inevitable. Restoration feasibility and design must incorporate a detailed evaluation of linked local and catchment river functioning to ensure that appropriate morphologies are proposed to encourage morphological and ecological development linked to the anticipated flow and sediment regime. Failure to achieve this will result in extensive and relatively rapid destabilisation and enhanced local bank erosion along active meandering reaches, large-scale barform development in wandering reaches and enhanced bar and berm deposition and slow local bank erosion along presently inactive single thread channels.

This project recognises the dynamic nature of the rivers in the Forth river basin planning sub-basin district and the requirement to conduct appropriate high level and detailed hydromorphic assessments in order to ensure that the multiple benefit sites identified for priority action are restored using approaches that work with the river rather than against it, restoring process and appropriate channel form and recognising and predicting likely system dynamism.

1.2 The Study Area

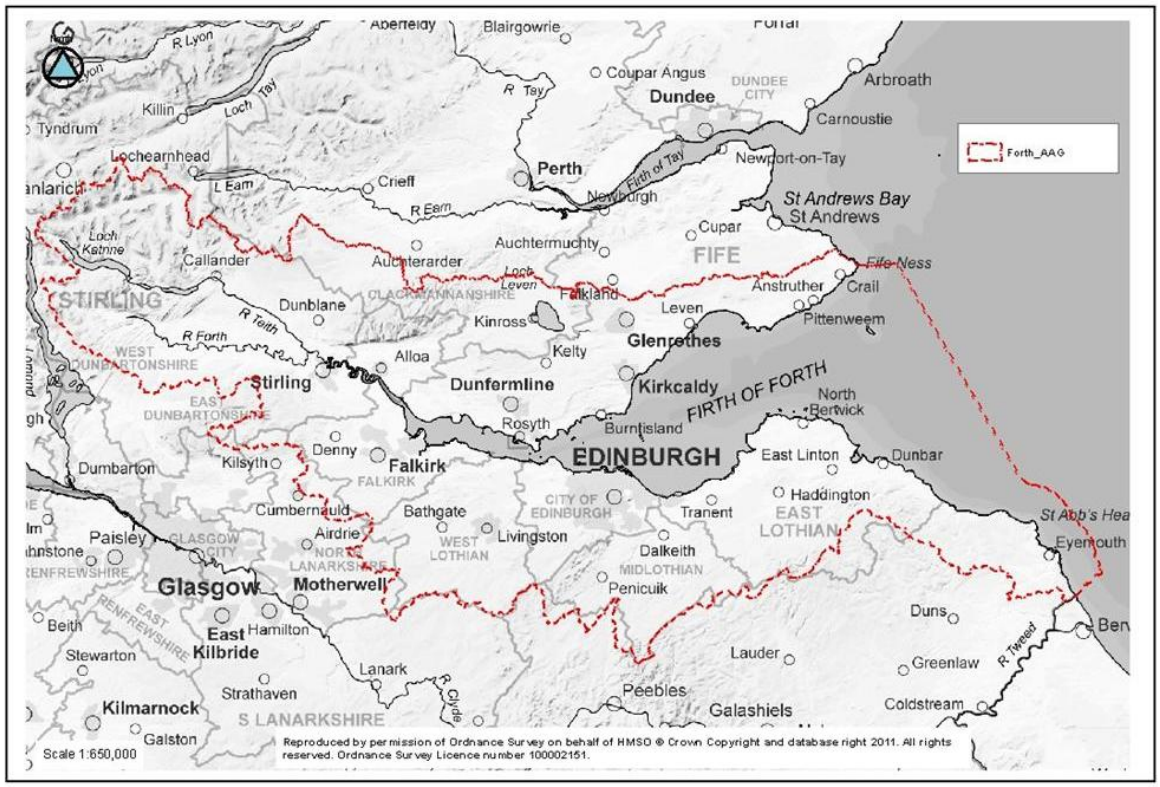
The Forth Sub-Basin District covers an area of approximately 4800 km^2 in central Scotland (Figure 1-1). The sub basin covers the southern Fife coast from Fife Ness to the Trossachs in the north west, passing along the outskirts of Greater Glasgow in the south and east towards the Scottish Borders and east coast at Berwick. The sub basin includes river, loch, groundwater, coastal, and estuarine (Forth upstream of the Forth Road Bridge) water bodies. The sub basin includes a number of hydrological catchments including the River Forth, River Leven, Water of Leith, River Almond, River Devon, Allan Water and coastal streams on the east coast and Fife.

The Forth Area Management Plan (FAMP)[2] documents that in 2008 only 28% of water bodies in the Forth sub basin were classified as being at good or high ecological status or potential. The plan aims to improve those water bodies classified at less than good to at least good, with the aim of 96% of the water bodies achieving good or high status or potential by 2027.

The Forth Basin has been lived in for millenia with anthropogenic impacts altering the environment through engineering, abstraction, discharge, land management and culverting. The catchment includes c. 1.3 million people or about 25% of the Scottish population and houses the capital and a number of key existing and historic industrial areas. Large parts of the catchment have been impacted by mining activity including the abstraction of coal, oil shale and other minerals. Some activity is still evident in the form of bings and minewater discharges.

[2] SEPA. 2010. Improving the quality of Scotland's water environment, Forth area management plan 2010-2015, supplementary to the river basin management plan for the Scotland river basin district. SEPA

Figure 1-1: Forth Sub Basin District



Whilst the sub basin includes river, loch, groundwater, coastal, and estuarine water bodies this study focuses river and loch water bodies due to the methodologies use of the Integrated Habitat Network dataset.

1.3 Study Aims & Objectives

Forestry Commission Scotland, SEPA, SNH and the Central Scotland Green Network Support Unit have commissioned JBA Consulting to process available spatial data and identify the areas and regions where multiple benefit projects can be delivered and which will most benefit from these improvements.

The primary aim of this project is to achieve multiple benefits as a result of spatially linking Water Framework Directive pressure sites, habitat connectivity, Integrated Habitat Networks (IHN)[3] and flood risk sites, helping to achieve international biodiversity targets and increasing environmental resilience to climate change and anthropogenic pressures.

In particular there is an opportunity to integrate the improvement actions listed for the Forth river basin planning sub-basin district by improving the following hydromorphologic elements:

- Floodplain connectivity and flood storage
- Wetland creation as part of sustainable urban drainage systems (SuDs)
- Buffer strip creation
- Management to alleviate diffuse pollution
- Local morphology and process restoration
- Riparian enhancement
- Sediment management

Implementing these measures will enhance local habitat, improve river – floodplain connectivity and begin restoring floodplain dynamics. There are also opportunities to both prioritise restoration locations and select restoration actions that offer the most appropriate system naturalisation outcomes thereby offering additional benefits to enhancing biodiversity,

[3] Watts, J et al. 2005. Evaluating Biodiversity in Fragmented Landscapes: Principles. Forestry Commission.

managing flood risk and improving critical area and connectivity linked to Scotland's ecological network.

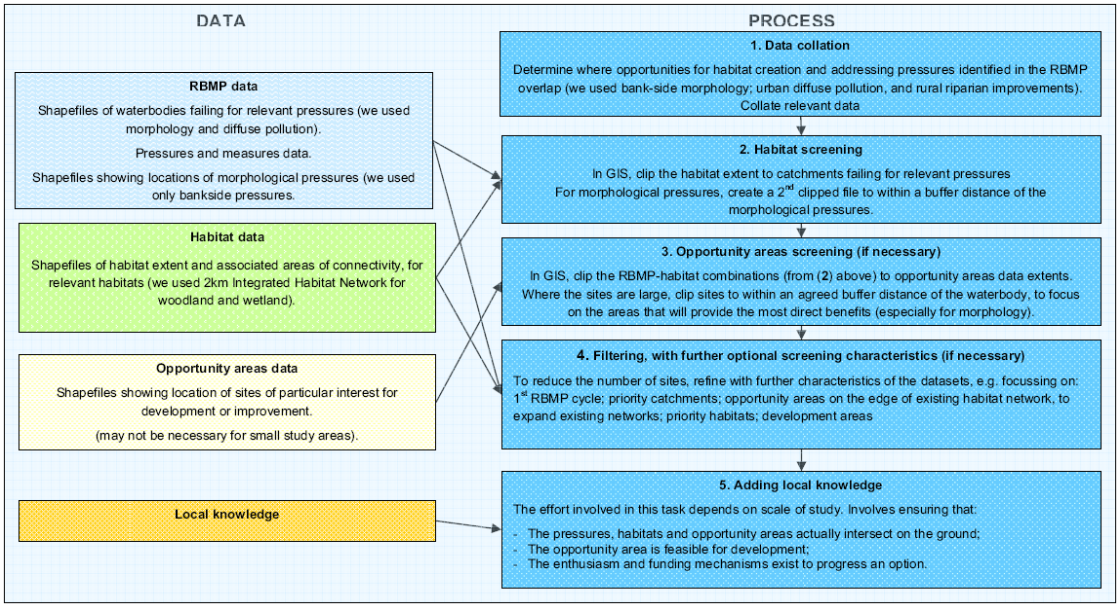
This study is split into two phases. Phase 1 of the analysis has been used to define 4 study reaches for further assessment and determination of potential restoration sites and this process is described within this report. Phase 2 of this project (which will be covered in a separate report) will involve:

- Carrying out habitat assessment survey of the four defined study reaches and making an assessment of the sites considering habitat management, expansion opportunities and potential restoration options;
- Working up detailed and costed restoration/feasibility plans for four defined opportunity areas in partnership with key stakeholders and the Forth Area Advisory Group;
- Assessing the eligibility of these proposals against major funding criteria, for example SEPA's restoration fund and Scottish Rural Development Programme.

1.4 Previous Study - River Clyde Pilot Study

This study adapted the protocol first created as part of the 'Ecological networks and River Basin Management Planning: Clyde Pilot Study'[4] which aimed to allow the identification of key sites where multiple benefits may be achieved (Figure 1-2). In particular, this aims to identify opportunities to create or enhance areas of habitat and habitat connectivity whilst contributing to Water Framework Directive (WFD)[5] objectives where improvements to habitat connectivity are seen as a key mechanism for reversing the effects of fragmentation on biodiversity, improving landscape resilience, and helping species adapt to climate change. Improving the connectivity between various work areas and bodies also helps to initiate discussions with the aim of increasing funding opportunities. Increasing environmental quality and social connectivity are designated as key infrastructure needs within the Scottish Governments National Planning Framework (NPF2)[6].

Figure 1-2: Clyde Pilot Study Flow Chart



Phase 1 of this JBA assessment broadly applies the methodology developed during the 'Ecological Networks and River Basin Management Planning: Clyde Pilot Project'[7] with the

[4] Musgrave, H, Morgan, G, Stoke, R. 2010. Ecological Networks and River Basin Management Planning: Clyde Pilot Study. Entec UK Limited.

[5] European Parliament. 2010. Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. Official Journal, OJ L 327.

[6] Scottish Government, 2012. National Planning Framework for Scotland 2, Monitoring Report 2012

[7] http://www.sepa.org.uk/water/river_basin_planning/area_advisory_groups/clyde.aspx

aim of defining 4 specific study reaches in which to develop restoration plans and options. Phase 2 involves the more detailed assessment of the 4 specific study reaches determined within Phase 1.

The Clyde protocol was split into the following 5 steps:

- **Step 1 – Data Collation, Data Screening and Determination of Relevant Data Combinations.** Using RBMP spatial data and other RBMP data.
- **Step 2 – Habitat Screening.** Determining where the Integrated Habitat Networks (IHN) (Woodland, Grassland and Wetland) overlap failing water bodies with respect to Morphology, Urban Diffuse Pollution and Rural Diffuse Pollution).
- **Step 3 – Opportunity Areas Screening.** Using Community Growth Area, Vacant Land, Local Plan, Local nature designations, Scottish Wildlife Trust and RSPB reserve datasets.
- **Step 4 – Filtering.** The output of steps 2 and 3 identifies all of the possible opportunity areas. Therefore step 4 aims to prioritise the areas.
- **Step 5 – Adding Local Knowledge.** To carry out a reality check on the initial findings of step 4.

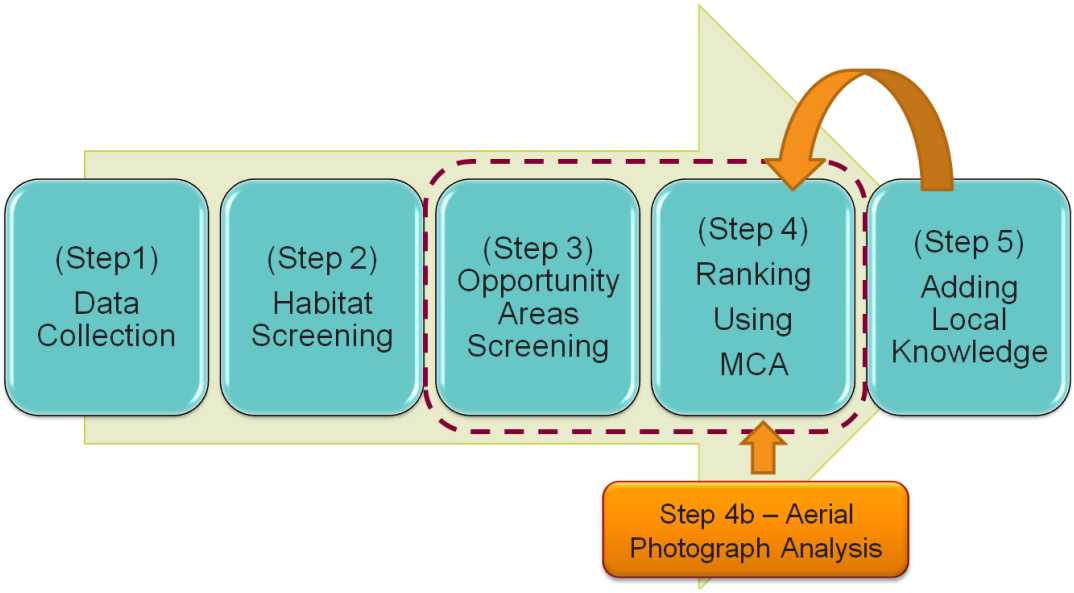
1.4.1 Adaptation of the Clyde protocol

While broadly following the protocol set out in the Clyde protocol adjustments were primarily made during steps 3 and 4.

During this study the opportunity datasets where collated during step 3 but rather than removing opportunity areas through screening at this stage all areas were retained for further analysis within the GIS. Furthermore rather than undertaking a simple filtering during step 4, sites were instead ranked using a multi-criteria analysis (MCA) developed during this study and hence replacing the Clyde protocol step 4. This process allows a large number of datasets to be compared throughout the project.

In addition during step 4 (ranking process) JBA have conducted an additional web based hydromorphic pressure screening using aerial photography to validate the high level hydromorphic information supplied for the sub-basin sites by SEPA. Figure 1-3 below shows the process followed by JBA.

Figure 1-3: Forth Basin Study Process



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2 Opportunity Area Identification Process

2.1 Step 1: Data Selection/Screening

This initial stage is used to determine which types of River Basin Management Planning (RBMP) pressures are relevant to habitat creation. This output dataset is then used to select the relevant combinations of datasets to be used in the later screening.

2.1.1 RBMP Data

Only baseline rivers and lochs[8] are considered in this project as the Water Framework Directive only requires member states to classify, identify pressures and measures for these water bodies and so this information is not available for water bodies that fall outwith the size threshold. Whilst small burns and lochs were not considered in the analysis it is important to remember that the Water Framework Directive applies to the whole water environment and the broad objectives of WFD still apply – that is to protect and improve the water environment. Furthermore, the Integrated Habitat Network (IHN)'s datasets currently mapped do not include coastal or estuarine habitats; therefore only river and loch water bodies can currently be assessed.

The RBMP defines 6 main pressures and these along with a discussion of whether they can be addressed by this project are shown in Table 2-1.

Table 2-1: RBMP Pressures

Pressure	Addressed within this study?	Reason for exclusion
Abstraction	N	Addressed through regulation
Flow Regulation	N	Addressed through regulation
Morphology	Y	Likely to be rectifiable with development or land use change and are within the scope of this project.
Diffuse Pollution	Y	Likely to be rectifiable with development or land use change and are within the scope of this project.
Point Source Pollution	Y	Likely to be rectifiable with development or land use change and are within the scope of this project.
Alien species	N	Aquatic Alien Species in the Forth Sub Basin are limited to two instances; Canadian Pondweed and North American Signal Crayfish, neither of which can be addressed under this project. Riparian Invasive species are mapped on a regional level but the data is incomplete and only available for certain catchments.

The derivation of morphological pressure for the RBMP takes account of twelve types of morphological alterations, all of which have been mapped for every baseline water body and were supplied in GIS format. Not all of these are directly relevant to addressing terrestrial ecological networks. They can be seen in Table 2-2.

[8] A baseline water body is a river which drains a catchment greater than 10km2, lochs bigger than 0.5km^2, all coastal waters out to three nautical miles, transitional waters such as estuaries and groundwaters. A non-baseline water body is a river or loch which falls below the size threshold.

Table 2-2: Morphological Pressures

Type of morphological alterations	Morphology database descriptor	Relevance	Used in Selection
1 Set-back embankments	Set_Bank_Embankments	Removal of embankment and creation of alternative flood storage provides good habitat creation opportunities	Y
2. Embankments	Embankments_Bank_Reinforcement Embankments_N_Reinforcement	Removal of embankment and creation of alternative flood storage provides good habitat creation opportunities	Y
3. Riparian vegetation changes or clearance	(separate database)	Restoration of riparian vegetation provides opportunities to expand IHNs. Clearly relevant, but not used due to practical difficulties with incorporating in to screening	N
4. Green bank revetment	Green_Bank_Reinforcement	Use of green bank reinforcement ties in to marginal and terrestrial habitats	Y
5. Other bank revetment	Grey_Bank_Reinforcement Pipe_Box_Culverts	Conversion to green bank would tie in to marginal and terrestrial habitats	Y
6. Sediment removal (<50% of channel)	Dredging Sediment_Removal	Does not directly affect terrestrial habitats (depending on disposal method)	N
7. Sediment removal (>50% of channel)	Dredging Sediment_Removal	Does not directly affect terrestrial habitats (depending on disposal method)	N
8. Artificial bed material	Bed_Reinforcements	Does not directly affect terrestrial habitats	N
9. Flow deflectors	Flow_Deflectors Boatslips	Does not directly affect terrestrial habitats	N
10. Major flow deflectors	Flow_Deflectors	Does not directly affect terrestrial habitats	N
11. Impoundment	Impoundment	Does not directly affect terrestrial habitats	N
12. Resectioning	High_Impact_Realignment Low_Impact_Realignment	Re-creation of meandering channel includes good opportunities for creation of new habitats	Y
13. Other	Bridges, Causeways, Fords, Intakes, Outfalls, Jetties, Platforms, Marinas	In-channel or across-channel structures of little relevance to terrestrial habitat creation	N

2.1.2 Screening

This initial phase of screening was carried out in MS excel. The SEPA pressure database extract "110201 database extract pressure spreadsheet"[9] gives details of all sections of baseline water bodies in Scotland. It contains catchment information, water body details and information about the pressure type, pressure source, location and assessment parameters. It also details other information such as land ownership if available, improvement measures and timescales. The following screening was undertaken:

- This data was initially screened to only show rivers and lakes in the Forth Sub Basin area and then to show water bodies that have a current overall classification of less than good (Moderate, Poor and Bad).

[9] RBMP database data extracted and supplied to JBA by Shona McConnell on 01 September 2011

- Within this screening the three pressures of interest Morphological Alterations, Rural Diffuse Pollution, and Urban Diffuse Pollution were also selected.
- The Morphology entries were then examined and entries under the "Location Description" field filtered to remove any Morphological Activity types which relate to in channel works such as impoundments, dredging or bed reinforcement.
- The "Assessment Parameter" field was also then filtered to remove any entries related to "Fish Passage".

These amendments produced a list of water bodies where the pressures should be ones that ought to be able to be tackled through the aims of this project.

The results are then saved as 3 individual sheets (one for each of the pressures - Morphological, Rural Diffuse Pollution and Urban Diffuse Pollution) and which are then brought into the GIS.

2.2 Step 2: Habitat Screening

Step 2 of the analysis is that of identifying where the integrated habitat networks (IHN) and failing water bodies intersect. This analysis is undertaken within the GIS. Key datasets used are shown in the table below. The GIS screening methodologies used are described further in Section 2.2.1.

Table 2-3: GIS datasets used within the Step 2 Analysis

Data	Source
RBMP Pressures (110201 database extract.xls)	SEPA
River Water bodies (SV_WB River)	SEPA
Lake Water bodies (SV_WB Lake)	SEPA
IHN Buffer Areas	Forest Research
Morphology Pressures	SEPA

2.2.1 Integrated Habitat Network (IHN) data

The IHN data was supplied by Forest Research. It is based upon the BEETLE (Biological and Environmental Evaluation Tools for Landscape Ecology) model and is a measure of the ability of species to penetrate through a habitat according to the land use type. Three different IHN data types were supplied for this project;

1. Broadleaved and Yew Woodland,
2. Fen Marsh and Swamp, and
3. Grassland.

A core network and a buffered network were supplied for all three data types, the 2km buffered network was used in the initial site selection then the core network is utilised later on in the filtering stage.

The SV_WB River digital river network was initially buffered by 100m and merged with the SV_WB Lake dataset, this produced a unified water body polygon. Areas where the river buffer overlaps the lakes was then clipped and removed. This process retains all the original attribute information from the individual water body files such as WB_ID, name etc.

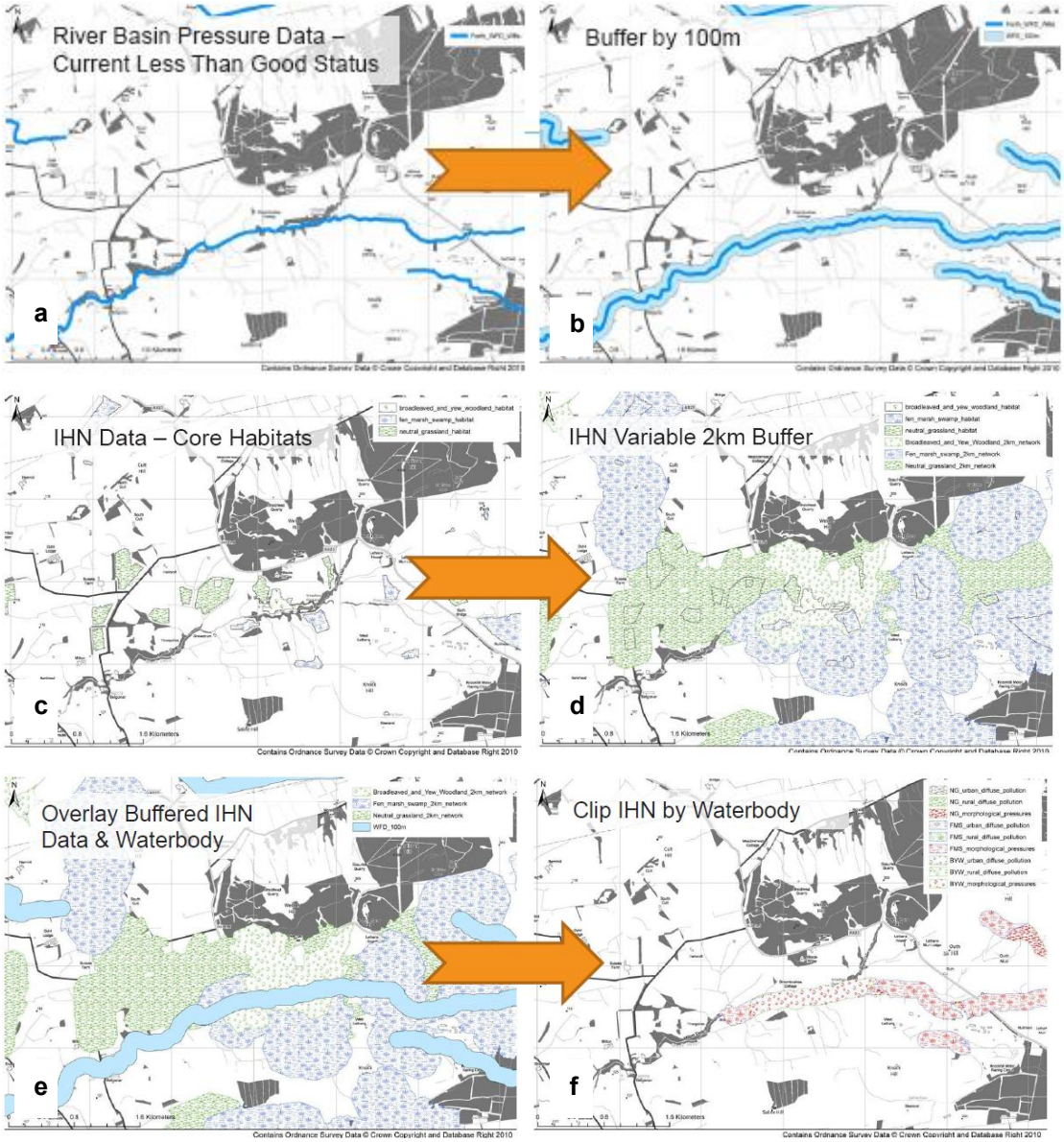
This merged file was then joined to each of the 3 pressure excel sheets (derived in step 1) in turn using the WB_ID field found in both the water body network file and the pressure data excel sheets, this is done using an "Outer Join" so that only matching fields are kept. This results in three separate GIS datasets showing the water bodies which are failing on each of the pressures identified in Step 1.

The areas where the failing water bodies intersect with the Integrated Habitat Networks are then identified. This is done by "Clipping" the water bodies to the IHN extents. This results in 9 separate shape files. This process is shown overleaf in Figure 2-1. An extra field was then created to identify which pressure and which IHN they were derived from. This was undertaken using a simple field calculation to populate the field for each of the separate files. The final naming structure is detailed within Table 2-4.

Table 2-4: Naming System

	Morphological Pressure (Morph)	Urban Diffuse Pollution Pressure (UrbanDP)	Rural Diffuse Pollution Pressure (RuralDP)
Broadleaved & Yew Woodland (BYW)	Morph_BYW	UrbanDP_BYW	RuralDP_BYW
Fen, Marsh & Swamp (FMS)	Morph_FMS	UrbanDP_FMS	RuralDP_FMS
Neutral Grassland (NG)	Morph_NG	UrbanDP_NG	RuralDP_NG

Figure 2-1: Graphical examples of GIS Habitat Screening (Step 2)



SEPA's morphological pressure features were then merged and buffered by 25m. This dataset is then used to further clip the three layers that represent the extents of the three IHNs that are affected by Morphological pressures. This process restricts the influence of the morphological pressures and prevents potential minor features highlighting entire sections of watercourse.

Finally the 9 separate files are merged together to give a final opportunity areas result file which is then used in Step 3. This analysis resulted in 391 opportunity areas based on the IHN screening. These are shown in the following Figures.

Figure 2-2: All Opportunity Areas

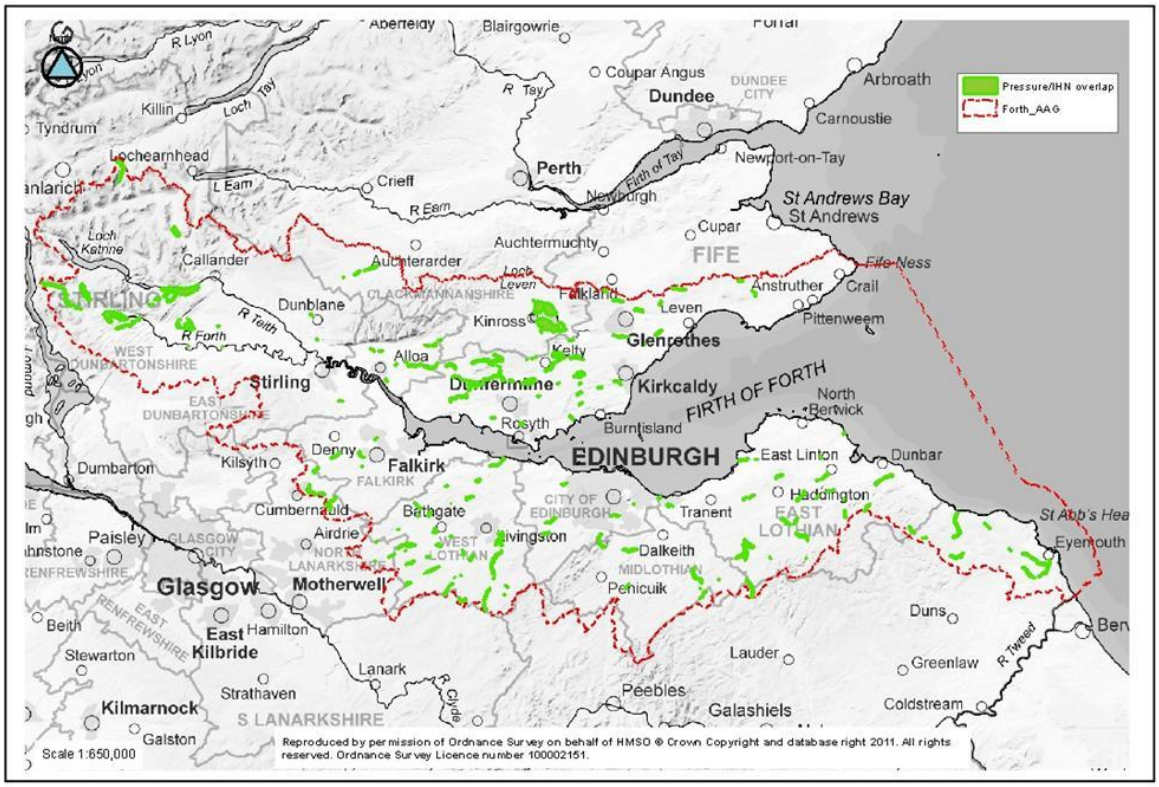


Figure 2-3: Morphological Pressure Opportunity Areas

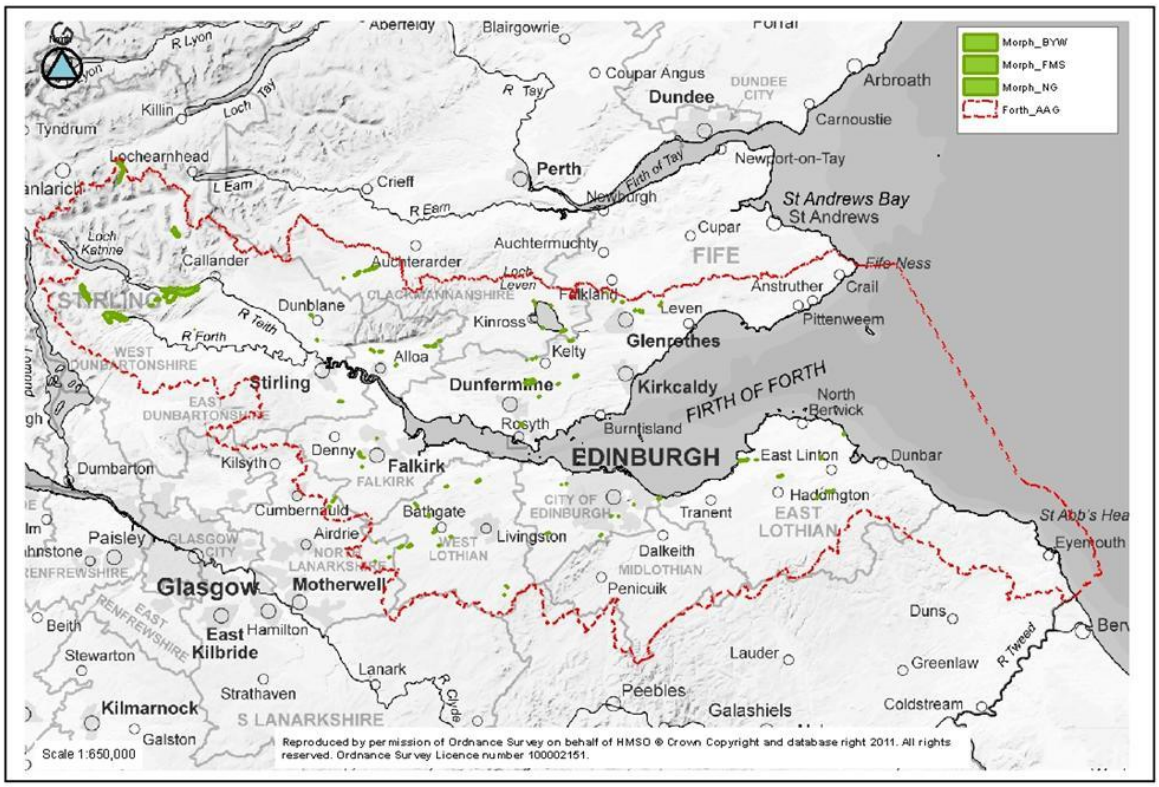


Figure 2-4: Rural Diffuse Pollution Pressure Opportunity Areas

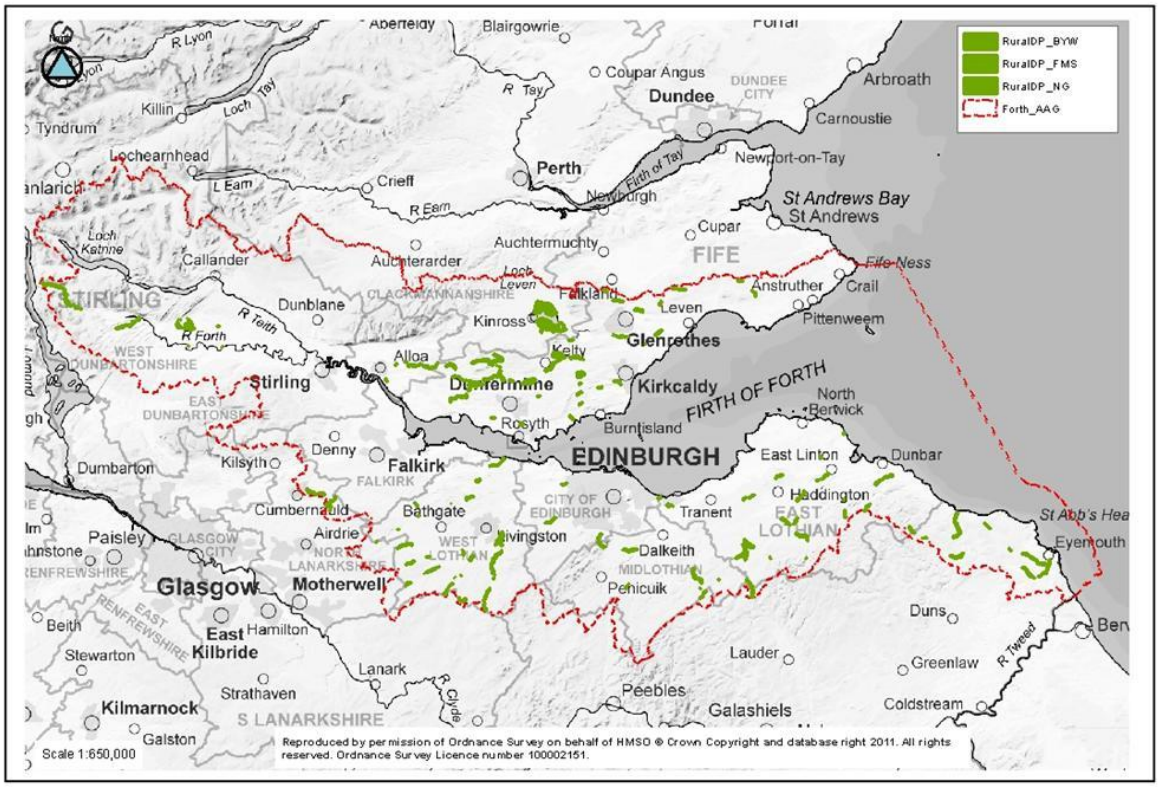
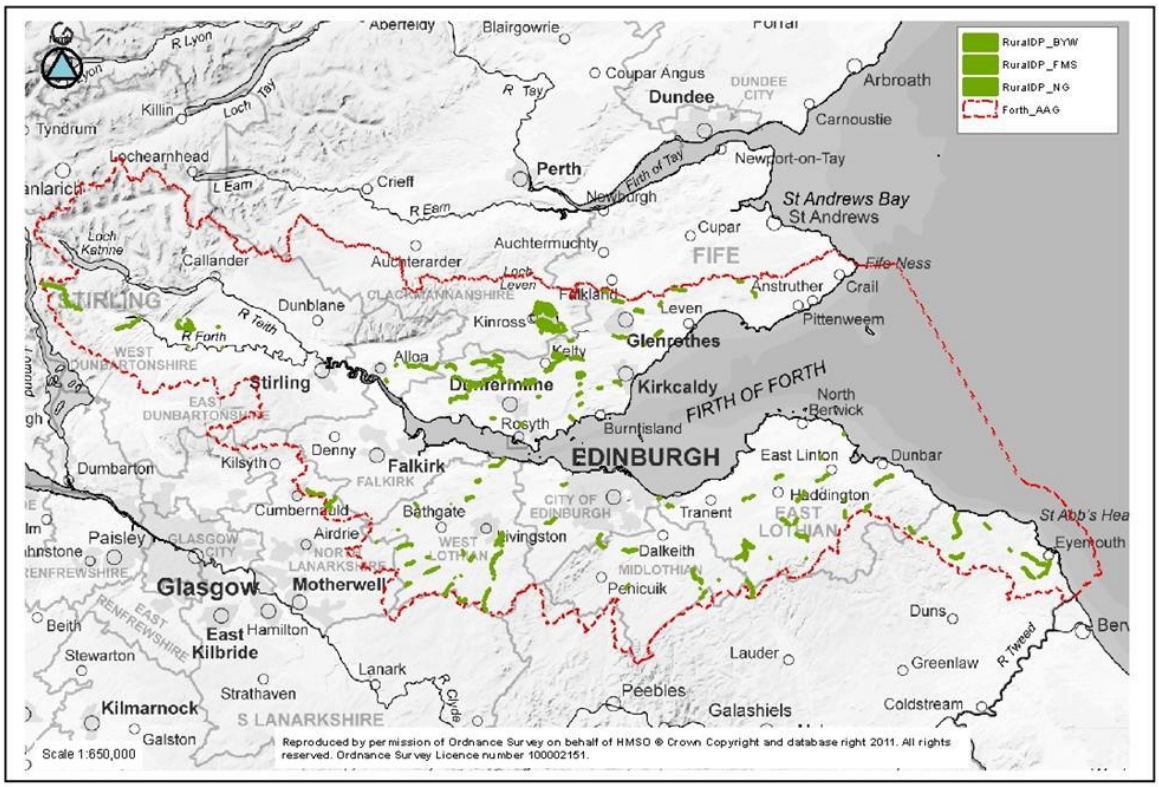


Figure 2-5: Urban Diffuse Pollution Pressure Opportunity Areas



2.3 Step 3: Opportunity Areas Screening

The next step was that of undertaking an initial screening of the opportunity areas by comparing the dataset developed during step 2 against a range of geographic data in order to highlight the regions that offer the best scope for the opportunity to achieve multiple benefits in a single location.

Within the Clyde methodology opportunity areas which did not intersect with at least one of the opportunity screening datasets were removed. However in the case of this study it was deemed that this would reduce the number of opportunity areas at an early stage in the process and there is no clear benefit for this reduction in sites being considered as gathering data in GIS can allow for all parameters to be output easily for every opportunity area identified in step 2. Prioritisation can then be given to key parameters during the filtering and prioritisation phase (Step 4).

Therefore during this study step 3 was used simply to collate the opportunity datasets and thus allowing all 391 sites to be presented to the stakeholders via workshops (as ranking through the MCA had not been completed at this time).

2.3.1 Opportunity area datasets

Due to the size of the area being analysed there were a very large number of datasets to manage and analyse. This lead to overlaps and differences in both the type of the data and the data itself as it came from many different sources, as a result five core "opportunity" datasets were created from an amalgamation of many different local and national scale datasets. They consist of:

- Community Growth Areas,
- Areas of vacant and Derelict Land,
- Local Environmentally Sensitive Sites,
- National Environmentally Sensitive Sites and
- Core Paths.

The datasets used are listed within Table 2-5.

Table 2-5: Initial Opportunity Screening Datasets

Opportunity Areas Dataset	Source
Community Growth Areas	Local plan data from all the 10 LA areas
Areas of Vacant and Derelict Land	Some local plan info, Scottish Government point dataset.
Core Paths	Local Plans, SUSTRANS
Local Environmentally Sensitive Sites	Combined: SINC, LNR, SWT, RSPB and LA data
National Environmentally Sensitive Sites	Combined SSSI, NNR, SAC data

2.4 Step 4: Multi-Criteria Analysis - Ranking / Prioritising Opportunity Areas

Steps 2 and 3 identified all of the potential opportunity areas within the Forth Basin Area. This resulting dataset was large (391 individual opportunity areas) and alone this number of areas is of limited use in terms of prioritising areas and deriving action plans.

Multi-criteria analysis is a decision making tool which allows a transparent prioritisation / ranking process to be undertaken. Such analysis allows scores and weights to be applied to a range of qualitative datasets. This is an extremely useful tool with respect to this study where the achievement of multiple benefits is key and allows an unlimited number of datasets to be assessed.

In this case MCA has been undertaken using a range of parameters which for ease of collation and assessment have been grouped as follows:

- Flood Risk
- Socio-Economic
- Environmental

- WFD Pressures
- General Opportunities

The parameters used or investigated within each group are detailed below in Tables 3-1 to 3-5. A number of parameters were investigated but may not have been used within the final analysis, thus the parameter used column describes whether the datasets where used in this case.

Some datasets are simply quantified with a yes or a no, for example "Does the site lie wholly within the SEPA flood map". In this case a yes is assigned a score of 1 and no a score of zero. Other parameters can be directly quantified numerically, for example". How long is the river reach within this area" can be quantified in metres.

Each parameter must be directly comparable to another, i.e. if we are considering a site which lies wholly within the SEPA flood map and is 100m long and comparing this to a site which lies outwith the floodmap and is 1000m long and we score the river length as a value. If we simply add up each of the parameter score, this could result is a score of 101 compared to 1000. Thus giving greatest weighting to the length of the second site as it has the longest reach. Thus to allow all parameters to be directly comparable numerical scores have been converted into scores between 1 and 0 by dividing the data into percentile 'bins' and assigning a score for each percentile.

Each individual parameter is then summed and normalised by the number of parameters being used to give a parameter group score. By normalising the scores at this stage no particular group is favoured over the others.

Table 2-6: Flood Risk

Parameter	Description	Parameter Used	Reason for using parameter
Wholly Within Fluvial 200 yr (Y/N)	Does the site lie wholly within the SEPA flood map	Y	Is the site connected with the functional floodplain. If this area is restored this could therefore be with respect to sustainable flood management
Partially Within Fluvial 200 yr (Y/N)	Does the site lie partially within the SEPA flood map	Y	Is the site connected with the functional floodplain. If this area is restored this could therefore be with respect to sustainable flood management
Location Within Catchment	Is this an upland or lowland site?	Y	If area is located in a lowland area then flood risk benefits downstream of the site may be small
FPS within Catchment (Y/N)	Are there any flood prevention schemes within the catchment	Y	FPS is a sign of existing flood risk issues within a catchment
Within Coastal 200 yr (Y/N)	Does the site lie within the SEPA flood map	Y	Restoration could be undertaken in conjunction with reducing flood risk
With Ground Water Hazard Area (Y/N)	Does the site lie within the Ground Water Hazard Area	Y	Restoration could be undertaken in conjunction with reducing flood risk
Instance of Historical Flooding (2010 SEPA dataset) (Y/N)	Has there been an instance of flooding within this area	Y	Historical instances of flooding suggest there is a flood risk issue within the catchment, thus this might be addressed
Time to Peak (hrs)	Is the catchment flashy?	N	If the catchment is flashy then watercourse may be more dynamic
No. of Properties Downstream at Flood Risk (Count)	How many properties lie within the SEPA Flood Map downstream of the area	Y	If you have a large number of properties at flood risk downstream of the area then works could have more impact on reducing this flood risk

Table 2-7: Socio-Economic

Parameter	Description	Parameter Used	Reason for using parameter
Area Intersected by Core Path (Y/N)	Does the area intersect with a core path?	Y	Site is already connected with a core path but could also mean that this network could be expanded
Core Path within 250 m of Area (Y/N)	Is there a core path within 250 m of the area?	Y	Opportunity to expand the path network and hence access
Derelict Vacant Land Within Area (Y/N)	Is there derelict land within the area?	Y	Opportunity to include restoration within future developments
Planned Development Area Within Area (Y/N)	Is there a planned development area within the area?	Y	Opportunity to include restoration within future developments
Ancient Monument Within Area (Y/N)	Is there an ancient monument within the area?	Y	Could future works be constrained by ancient monuments
World Heritage Site Within Area (Y/N)	World Heritage Site Within this Area?	Y	Could future works be constrained by world heritage sites
Corine Land Use Dataset	Land Use Data	N	Is the existing land use sensitive to restoration
Length of Reach of Watercourse Within Area (m)	How long is the river reach within this area	Y	The longer the reach the greater the cost might be. Also the longer the reach the larger the area you could be restoring.
Distance to An Area Which is in the 15%ile of SIMD data (m)	The distance from the lowest 15% of the SIMD dataset	Y	Aim of improving more deprived areas
Distance To Population Centre of 1 thousand people (m)	Distance of area from population centre greater than 1km	Y	Connecting communities with the water environment

Table 2-8: Environmental

Parameter	Description	Parameter Used	Reason for using parameter
Area Intersects With Local Nature Reserve (Y/N)	Does the area intersect with LNR data?	Y	
Area Intersects With National Nature Reserve (Y/N)	Does the area intersect with NNR data?	Y	
Invasive Species Recorded Within Area (Y/N)	Have invasive species been recorded within the area?	Y	This is not a complete dataset. However indication whether one of project objectives could be achieved, i.e. where INNS present.
IHN Parent Patchiness	Patchiness of core IHN dataset	Y	Opportunities to expand IHN. (Size of opportunity area compared to the full 2km buffered Habitat Network, investigate patchiness)
Note: LNR dataset is a combination of SINC, LNR, SWT, RSPB and LA data. NNR dataset is a combination of SSSI, NNR, SAC data			

The high level hydromorphic audit (aerial photography analysis) parameter listed within Table 2-9 was undertaken for each opportunity area. This is a further adaptation of the Clyde protocol and is described with Appendix C. This procedure used aerial imagery from Google Earth thus including a further sense check prior to ground truthing of the final 4 study reaches which will be undertaken during Phase 2. The opportunity ranking gained from this procedure agreed well with a qualitative assessment made during the aerial photograph analysis based on an overall impression of each channel system.

Table 2-9: WFD Pressures

Parameter	Description	Parameter Used	Reason for using parameter
Aerial Photography Analysis - Quantitative In Channel (Score)*	Quantitative Analysis of in channel potential	N	Does the channel type present good opportunity for restoration. (Based on Worst state, best current state opportunity, mixed state so local potential, mix of opportunities based area diff river types, rarest types)
Aerial Photography Analysis - Quantitative Floodplain (Score)*	Quantitative Analysis of in floodplain potential	N	Does the floodplain type present good opportunity for restoration. (Based on Worst state, best current state opportunity, mixed state so local potential, mix of opportunities based area diff river types, rarest types)
Aerial Photography Analysis - Combined (Score)*	Combined score created from in channel & floodplain score	Y	This parameter is the combined channel and floodplain score
Point Source Pollution Dataset Point Within Area (Y/N)	Is there a point source pollution point occurring within this area?	Y	
SUDS	Are there any SUDS within the area?	N	Dataset now available
No. of Adjacent Pressure Overlaps (Count)	How many opportunity areas overlap?	Y	
Current Status	Current Water body Status	N	Dataset included in MCA set up but only used to calculate change in status parameters
Status By 2015	Target 2015 status	N	Dataset included in MCA set up but only used to calculate change in status parameters
Status By 2021	Target 2021 status	N	Dataset included in MCA set up but only used to calculate change in status parameters
Status By 2027	Target 2027status	N	Dataset included in MCA set up but only used to calculate change in status parameters
Change in Status to Current to 2021 (Score)	What is the change in status	Y	Priority given to sites with greatest change in status programmed up to specified date
Change in Status to Current to 2027 (Score)	What is the change in status	N	Priority given to sites with greatest change in status programmed up to specified date. Not used in this case as it overlaps with parameter above.
Change in Status to 2021 to 2027 (Score)	What is the change in status	Y	Priority given to sites with greatest change in status programmed up to specified date

Parameter	Description	Parameter Used	Reason for using parameter
Heavily Modified or Artificial Water Body (Score)		Y	
* The high level hydromorphic audit for each opportunity area is described with Appendix C.			

Datasets available but not used include SEPA's riparian vegetation database (Inventory of the structure of riparian vegetation) and Stream power dataset (Is sufficient energy available for river to restore itself over time).

Table 2-10: General Opportunities

Parameter	Description	Parameter Used	Reason for using parameter
No. of Opportunity Areas Per Water body (Count)	A count of the number of opportunity areas that occur on particular water body	Y	The larger the number of opportunity areas present on the water body deemed to be positive
Area of Opportunity Area (m2)	Total area of the opportunity areas	Y	The larger the area of opportunity areas present on the water body deemed to be positive
Local Knowledge - Project In Progress (Y/N)		N	Local knowledge was used to assess the ranked option

At this stage a total score can then be calculated for each of the parameter groupings, by first adding up each parameter score and then dividing this by the number of parameters being considered within each grouping. i.e. within the environment grouping there are a total of 4 parameters being used so the sum of all the parameter scores is divided by 4. This means that the five parameter groups can then be compared side by side.

2.4.1 Multi-Criteria Analysis - Ranking Analysis

The next step in multi-criteria analysis can be to apply extra weighting to specific groups of parameters or individual parameters. This was firstly undertaken as a sensitivity analysis but also to consider the priority given to each of the parameter groups which in turn are linked to the individual project aims.

During this step a range of different combinations of weighting can be applied. In this case six separate weighting scenarios were tested to assess which scenarios would best represent the aims of this project (i.e. IHN expansion, RBMP targets and public access). These tests include a no weighting scenario, as detailed below in Table 3-6. For example test scenario 3 gives greater weighting to flood risk, environmental and WFD pressure objectives; where during test scenario 5 gives less weighting to flood risk.

Table 2-11: Weighting Tests

Parameter Group	No Weigh	Test (1)	Test (2)	Test (3)	Test (4)	Test (5)
Flood Risk	1	0.5	0.25	1.5	1	0.25
Socio-Economic	1	0.5	1	0.25	1	1
Environmental	1	1.5	1.5	1.5	1	1.5
WFD Pressures	1	1.5	1.5	1.5	1	1.5
General Opportunity	1	1	0.75	0.25	1	0.75

In addition to applying weighting to the separate parameter groups weightings can also be applied to individual parameter sets. In this case the aerial photograph analysis parameter and number of opportunity areas on a water body parameter were given additional weighting, as detailed below in Table 3-7 within test scenarios 4 and 5 as these parameter are deemed to reflect the greatest opportunity for restoring the watercourse and improving the wider environment.

Table 2-12: Weighting Tests - Aerial Photography and No. of Opportunity Areas on Watercourse

Individual Parameter	No Weigh	Test (1)	Test (2)	Test (3)	Test (4)	Test (5)
Aerial Photo Analysis	1	1	1	1	2	2
No. of Opportunity Areas on Watercourse	1	1	1	1	2	2

Setting up an MCA in this way would also allow different sets of weights to be used in the future to reflect changes in legislative priorities. The results of each of these tests are shown below in Section 2.4.2.

2.4.2 Multi-Criteria Analysis - Weighting Tests Output

Each individual opportunity area has been given a unique ID. This is made up as follows:

> a unique consequential number _ the SEPA river basin water body ID _ the Pressure _ The IHN code _ OS Grid Reference of Centre of Area

The results of each of the weighting tests are shown below in Tables 3-8 to 3-13, the individual areas can also be viewed graphically within Appendix A where they are labelled by their corresponding rank.

Table 2-13: No Weighting (see Figure A-1)

Rank	Waterbody Name	Opportunity Area Unique ID
1	Kennoway Burn/Back Burn	238_6303_RuralDP_BYW_327655_703302
2	Black Devon (Source to Birkhill Plantation)	4_4403_RuralDP_FMS_301659_694309
3	Kennoway Burn/Back Burn	225_6303_RuralDP_BYW_327655_703302
4	Black Devon (Source to Birkhill Plantation)	161_4403_RuralDP_FMS_301659_694309
5	Braid Burn (Upstream Dreghorn Barracks to Portobello)	91_3500_UrbanDP_NG_325601_670271
6	Loch Venachar	299_100266_Morph_FMS_257327_705723
7	Bonny Water/Red Burn	268_4205_UrbanDP_FMS_279285_678039
8	Boghead Burn/Bog Burn/Couston Water	394_3107_UrbanDP_NG_296804_668468
9	River Almond (Maitland Bridge to Cramond)	102_3000_RuralDP_BYW_317454_675179
10	Black Devon (Source to Birkhill Plantation)	158_4403_RuralDP_NG_304235_694573
11	River Avon (Source to Jawhills)	264_3102_RuralDP_BYW_280583_672123
12	Black Devon (Source to Birkhill Plantation)	23_4403_RuralDP_FMS_301659_694309
13	Keith Water/Fala Dam Burn	43_4011_RuralDP_BYW_343929_662456
14	Kennoway Burn/Back Burn	236_6303_Morph_BYW_326604_703959
15	Linhouse water/Camilty Burn/ Green Burn	390_3014_RuralDP_BYW_307683_666618
16	Grange Burn	136_4302_RuralDP_NG_302024_689990
17	Linhouse water/Camilty Burn/ Green Burn	373_3014_RuralDP_FMS_306130_661017
18	Black Devon (Birkhill Plantation to Forth Estuary)	5_4402_RuralDP_BYW_293195_693906
19	Black Devon (Source to Birkhill Plantation)	6_4403_RuralDP_BYW_300582_694232
20	Grange Burn	140_4302_RuralDP_BYW_301917_689576
21	Boghead Burn/Bog Burn/Couston Water	395_3107_UrbanDP_FMS_296842_668945
22	Loch Venachar	298_100266_Morph_FMS_257327_705723
23	River Almond (Source to Foulshiels Burn confluence)	362_3003_UrbanDP_NG_296184_665600
24	Kennoway Burn/Back Burn	232_6303_RuralDP_FMS_328063_704726
25	River Tyne (Birns Water confluence to Estuary)	52_4000_RuralDP_NG_358528_676384
26	Bilston/Boghall Burn	83_3813_RuralDP_BYW_327882_664808
27	Loch Leven	215_100269_RuralDP_FMS_314676_701568
28	Kennoway Burn/Back Burn	223_6303_Morph_BYW_329565_702514
29	Birns Water/Humbie Water	42_4008_RuralDP_BYW_346149_663804
30	Boghead Burn/Bog Burn/Couston Water	391_3107_Morph_NG_297096_667730

Table 2-14: Weighting Test No. 1 (see Figure A-2)

Rank	Water body Name	Opportunity Area Unique ID
1	Kennoway Burn/Back Burn	238_6303_RuralDP_BYW_327655_703302
2	Keith Water/Fala Dam Burn	43_4011_RuralDP_BYW_343929_662456
3	Braid Burn (Upstream Dreghorn Barracks to Portobello)	91_3500_UrbanDP_NG_325601_670271
4	River Almond (Maitland Bridge to Cramond)	102_3000_RuralDP_BYW_317454_675179
5	River Avon (Source to Jawhills)	264_3102_RuralDP_BYW_280583_672123
6	Black Devon (Source to Birkhill Plantation)	161_4403_RuralDP_FMS_301659_694309
7	Kennoway Burn/Back Burn	236_6303_Morph_BYW_326604_703959
8	Linhouse water/Camilty Burn/ Green Burn	373_3014_RuralDP_FMS_306130_661017
9	Birns Water/Humbie Water	42_4008_RuralDP_BYW_346149_663804
10	Kennoway Burn/Back Burn	225_6303_RuralDP_BYW_327655_703302
11	Linhouse water/Camilty Burn/ Green Burn	390_3014_RuralDP_BYW_307683_666618
12	Black Devon (Source to Birkhill Plantation)	4_4403_RuralDP_FMS_301659_694309
13	Black Devon (Source to Birkhill Plantation)	158_4403_RuralDP_NG_304235_694573
14	Loch Leven	215_100269_RuralDP_FMS_314676_701568
15	Keith Water/Fala Dam Burn	248_4011_RuralDP_FMS_343172_661747
16	Loch Venachar	299_100266_Morph_FMS_257327_705723
17	Loch Venachar	298_100266_Morph_FMS_257327_705723
18	Black Devon (Birkhill Plantation to Forth Estuary)	5_4402_RuralDP_BYW_293195_693906
19	Black Devon (Source to Birkhill Plantation)	6_4403_RuralDP_BYW_300582_694232
20	Boghead Burn/Bog Burn/Couston Water	394_3107_UrbanDP_NG_296804_668468
21	Kennoway Burn/Back Burn	235_6303_RuralDP_FMS_328063_704726
22	Lake of Menteith	288_100271_RuralDP_BYW_258483_700065
23	Kennoway Burn/Back Burn	232_6303_RuralDP_FMS_328063_704726
24	Loch Venachar	303_100266_Morph_BYW_255074_705646
25	River Almond (Source to Foulshiels Burn confluence)	362_3003_UrbanDP_NG_296184_665600
26	River Leven (Loch Leven to Markinch)	206_6301_Morph_BYW_317454_699452
27	Muireston Water	369_3015_RuralDP_BYW_307293_666668
28	River Tyne (Birns Water confluence to Estuary)	52_4000_RuralDP_NG_358528_676384
29	Black Devon (Source to Birkhill Plantation)	23_4403_RuralDP_FMS_301659_694309
30	Loch Leven	208_100269_RuralDP_BYW_317138_699824

Table 2-15: Weighting Test No. 2 (see Figure A-3)

Rank	Water body Name	Opportunity Area Unique ID
1	Kennoway Burn/Back Burn	238_6303_RuralDP_BYW_327655_703302
2	Kennoway Burn/Back Burn	236_6303_Morph_BYW_326604_703959
3	Braid Burn (Upstream Dreghorn Barracks to Portobello)	91_3500_UrbanDP_NG_325601_670271
4	River Almond (Maitland Bridge to Cramond)	102_3000_RuralDP_BYW_317454_675179
5	Black Devon (Source to Birkhill Plantation)	161_4403_RuralDP_FMS_301659_694309
6	Kennoway Burn/Back Burn	225_6303_RuralDP_BYW_327655_703302
7	Keith Water/Fala Dam Burn	43_4011_RuralDP_BYW_343929_662456
8	Kennoway Burn/Back Burn	1_6303_Morph_BYW_328733_702676
9	Black Devon (Source to Birkhill Plantation)	158_4403_RuralDP_NG_304235_694573
10	River Avon (Source to Jawhills)	264_3102_RuralDP_BYW_280583_672123
11	Black Devon (Source to Birkhill Plantation)	4_4403_RuralDP_FMS_301659_694309
12	Linhouse water/Camilty Burn/ Green Burn	373_3014_RuralDP_FMS_306130_661017
13	Linhouse water/Camilty Burn/ Green Burn	390_3014_RuralDP_BYW_307683_666618
14	Kennoway Burn/Back Burn	223_6303_Morph_BYW_329565_702514
15	Braid Burn (Upstream Dreghorn Barracks to Portobello)	90_3500_Morph_NG_325018_670249
16	Boghead Burn/Bog Burn/Couston Water	391_3107_Morph_NG_297096_667730
17	Boghead Burn/Bog Burn/Couston Water	394_3107_UrbanDP_NG_296804_668468
18	Black Devon (Birkhill Plantation to Forth Estuary)	5_4402_RuralDP_BYW_293195_693906
19	Black Devon (Source to Birkhill Plantation)	6_4403_RuralDP_BYW_300582_694232
20	Kennoway Burn/Back Burn	0_6303_Morph_BYW_328664_702590
21	Braid Burn (Upstream Dreghorn Barracks to Portobello)	84_3500_Morph_NG_326150_670194
22	Kennoway Burn/Back Burn	235_6303_RuralDP_FMS_328063_704726
23	Kennoway Burn/Back Burn	232_6303_RuralDP_FMS_328063_704726
24	River Almond (Source to Foulshiels Burn confluence)	362_3003_UrbanDP_NG_296184_665600
25	Black Devon (Source to Birkhill Plantation)	23_4403_RuralDP_FMS_301659_694309
26	Kennoway Burn/Back Burn	222_6303_Morph_BYW_329931_702288
27	River Almond (Source to Foulshiels Burn confluence)	360_3003_Morph_NG_297833_665572
28	Boghead Burn/Bog Burn/Couston Water	393_3107_Morph_FMS_297065_667702
29	River Leven (Loch Leven to Markinch)	206_6301_Morph_BYW_317454_699452
30	Loch Leven	215_100269_RuralDP_FMS_314676_701568

Table 2-16: Weighting Test No. 3 (see Figure A-4)

Rank	Water body Name	Opportunity Area Unique ID
1	Kennoway Burn/Back Burn	238_6303_RuralDP_BYW_327655_703302
2	Keith Water/Fala Dam Burn	43_4011_RuralDP_BYW_343929_662456
3	Braid Burn (Upstream Dreghorn Barracks to Portobello)	95_3500_Morph_FMS_328480_672074
4	Braid Burn (Upstream Dreghorn Barracks to Portobello)	91_3500_UrbanDP_NG_325601_670271
5	Gosford Burn	64_3913_Morph_BYW_345567_678972
6	River Almond (Maitland Bridge to Cramond)	102_3000_RuralDP_BYW_317454_675179
7	Loch Venachar	299_100266_Morph_FMS_257327_705723
8	Braid Burn (Upstream Dreghorn Barracks to Portobello)	84_3500_Morph_NG_326150_670194
9	Gifford Water	47_4005_RuralDP_BYW_354747_667304
10	Keith Water/Fala Dam Burn	248_4011_RuralDP_FMS_343172_661747
11	Birns Water/Humbie Water	42_4008_RuralDP_BYW_346149_663804
12	Kennoway Burn/Back Burn	236_6303_Morph_BYW_326604_703959
13	Loch Venachar	302_100266_Morph_BYW_255074_705646
14	Loch Venachar	304_100266_Morph_BYW_255074_705646
15	River Avon (Source to Jawhills)	264_3102_RuralDP_BYW_280583_672123
16	Loch Venachar	305_100266_Morph_BYW_255074_705646
17	Allan Water d/s of Dunblane	272_6832_Morph_BYW_278595_698063
18	River Leven (Loch Leven to Markinch)	206_6301_Morph_BYW_317454_699452
19	Brothie Burn (Gartmorn Reservoir to Forth Estuary)	9_6908_Morph_BYW_291041_694021
20	Loch Leven	208_100269_RuralDP_BYW_317138_699824
21	Loch Venachar	303_100266_Morph_BYW_255074_705646
22	Black Devon (Source to Birkhill Plantation)	4_4403_RuralDP_FMS_301659_694309
23	Loch Venachar	298_100266_Morph_FMS_257327_705723
24	Lake of Menteith	288_100271_RuralDP_BYW_258483_700065
25	Braid Burn (Upstream Dreghorn Barracks to Portobello)	96_3500_UrbanDP_FMS_328470_672086
26	Black Devon (Birkhill Plantation to Forth Estuary)	5_4402_RuralDP_BYW_293195_693906
27	Black Devon (Source to Birkhill Plantation)	6_4403_RuralDP_BYW_300582_694232
28	Lake of Menteith	282_100271_RuralDP_NG_257308_700032
29	Brothie Burn (Gartmorn Reservoir to Forth Estuary)	10_6908_RuralDP_BYW_291041_694022
30	Loch Leven	215_100269_RuralDP_FMS_314676_701568

Table 2-17: Weighting Test No. 4 (see Figure A-5)

Rank	Water body Name	Opportunity Area Unique ID
1	Kennoway Burn/Back Burn	238_6303_RuralDP_BYW_327655_703302
2	Black Devon (Source to Birkhill Plantation)	4_4403_RuralDP_FMS_301659_694309
3	Kennoway Burn/Back Burn	225_6303_RuralDP_BYW_327655_703302
4	Black Devon (Source to Birkhill Plantation)	161_4403_RuralDP_FMS_301659_694309
5	Kennoway Burn/Back Burn	236_6303_Morph_BYW_326604_703959
6	River Almond (Maitland Bridge to Cramond)	102_3000_RuralDP_BYW_317454_675179
7	Black Devon (Source to Birkhill Plantation)	158_4403_RuralDP_NG_304235_694573
8	Black Devon (Source to Birkhill Plantation)	23_4403_RuralDP_FMS_301659_694309
9	Kennoway Burn/Back Burn	223_6303_Morph_BYW_329565_702514
10	Black Devon (Birkhill Plantation to Forth Estuary)	5_4402_RuralDP_BYW_293195_693906
11	Black Devon (Source to Birkhill Plantation)	6_4403_RuralDP_BYW_300582_694232
12	Kennoway Burn/Back Burn	1_6303_Morph_BYW_328733_702676
13	Boghead Burn/Bog Burn/Couston Water	394_3107_UrbanDP_NG_296804_668468
14	River Almond (Source to Foulshiels Burn confluence)	362_3003_UrbanDP_NG_296184_665600
15	Braid Burn (Upstream Dreghorn Barracks to Portobello)	91_3500_UrbanDP_NG_325601_670271
16	Kennoway Burn/Back Burn	232_6303_RuralDP_FMS_328063_704726
17	Loch Venachar	299_100266_Morph_FMS_257327_705723
18	Black Devon (Source to Birkhill Plantation)	194_4403_RuralDP_FMS_301659_694309
19	Grange Burn	136_4302_RuralDP_NG_302024_689990
20	Kennoway Burn/Back Burn	235_6303_RuralDP_FMS_328063_704726
21	Boghead Burn/Bog Burn/Couston Water	391_3107_Morph_NG_297096_667730
22	Kennoway Burn/Back Burn	0_6303_Morph_BYW_328664_702590
23	Grange Burn	140_4302_RuralDP_BYW_301917_689576
24	Boghead Burn/Bog Burn/Couston Water	395_3107_UrbanDP_FMS_296842_668945
25	Black Devon (Source to Birkhill Plantation)	162_4403_RuralDP_BYW_300582_694232
26	Black Devon (Birkhill Plantation to Forth Estuary)	3_4402_RuralDP_FMS_293160_693900
27	Black Devon (Birkhill Plantation to Forth Estuary)	2_4402_RuralDP_NG_289504_691547
28	River Avon (Source to Jawhills)	264_3102_RuralDP_BYW_280583_672123
29	Kennoway Burn/Back Burn	224_6303_RuralDP_BYW_327655_703302
30	Boghead Burn/Bog Burn/Couston Water	393_3107_Morph_FMS_297065_667702

Table 2-18: Weighting Test No. 5 (see Figure A-6)

Rank	Water body Name	Opportunity Area Unique ID
1	Kennoway Burn/Back Burn	238_6303_RuralDP_BYW_327655_703302
2	Kennoway Burn/Back Burn	236_6303_Morph_BYW_326604_703959
3	Braid Burn (Upstream Dreghorn Barracks to Portobello)	91_3500_UrbanDP_NG_325601_670271
4	River Almond (Maitland Bridge to Cramond)	102_3000_RuralDP_BYW_317454_675179
5	Black Devon (Source to Birkhill Plantation)	161_4403_RuralDP_FMS_301659_694309
6	Kennoway Burn/Back Burn	225_6303_RuralDP_BYW_327655_703302
7	Keith Water/Fala Dam Burn	43_4011_RuralDP_BYW_343929_662456
8	Kennoway Burn/Back Burn	1_6303_Morph_BYW_328733_702676
9	Black Devon (Source to Birkhill Plantation)	158_4403_RuralDP_NG_304235_694573
10	River Avon (Source to Jawhills)	264_3102_RuralDP_BYW_280583_672123
11	Black Devon (Source to Birkhill Plantation)	4_4403_RuralDP_FMS_301659_694309
12	Linhouse water/Camilty Burn/ Green Burn	373_3014_RuralDP_FMS_306130_661017
13	Linhouse water/Camilty Burn/ Green Burn	390_3014_RuralDP_BYW_307683_666618
14	Kennoway Burn/Back Burn	223_6303_Morph_BYW_329565_702514
15	Braid Burn (Upstream Dreghorn Barracks to Portobello)	90_3500_Morph_NG_325018_670249
16	Boghead Burn/Bog Burn/Couston Water	391_3107_Morph_NG_297096_667730
17	Boghead Burn/Bog Burn/Couston Water	394_3107_UrbanDP_NG_296804_668468
18	Black Devon (Birkhill Plantation to Forth Estuary)	5_4402_RuralDP_BYW_293195_693906
19	Black Devon (Source to Birkhill Plantation)	6_4403_RuralDP_BYW_300582_694232
20	Kennoway Burn/Back Burn	0_6303_Morph_BYW_328664_702590
21	Braid Burn (Upstream Dreghorn Barracks to Portobello)	84_3500_Morph_NG_326150_670194
22	Kennoway Burn/Back Burn	235_6303_RuralDP_FMS_328063_704726
23	Kennoway Burn/Back Burn	232_6303_RuralDP_FMS_328063_704726
24	River Almond (Source to Foulshiels Burn confluence)	362_3003_UrbanDP_NG_296184_665600
25	Black Devon (Source to Birkhill Plantation)	23_4403_RuralDP_FMS_301659_694309
26	Kennoway Burn/Back Burn	222_6303_Morph_BYW_329931_702288
27	River Almond (Source to Foulshiels Burn confluence)	360_3003_Morph_NG_297833_665572
28	Boghead Burn/Bog Burn/Couston Water	393_3107_Morph_FMS_297065_667702
29	River Leven (Loch Leven to Markinch)	206_6301_Morph_BYW_317454_699452
30	Loch Leven	215_100269_RuralDP_FMS_314676_701568

2.5 Step 5: Local Knowledge - Stakeholder Workshop

2.5.1 Workshop Process

A workshop was held on 31 August 2011 with the aim of introducing all key stakeholders within the Forth Sub Basin District to this multiple benefits project, to gain their local knowledge with respect to on going works within the basin and existing concerns. The initial opportunity areas were presented to the group and initial discussions held with respect to ranking parameters used.

2.5.2 Invitees and Attendees

A number of organisations representing the key stakeholders within the Forth Sub Basin District were invited to the workshop and a list of the invitees and attendee is shown in Table 2-19 below.

Table 2-19: Invitees & Attendees

Organisation	Attended (Y/N)
British Waterways	N
CATCA (Communities Along the Carron Association)	N
Chemicals Industry Association	N
City of Edinburgh Council	Y
Clackmannanshire and Stirling Landfill Tax Trust	Y
Clackmannanshire Council	Y
CSFT	Y
CSGN	Y
Dalkeith Country Park	N
Devon Angling Association	N
East Lothian Council	N
Edinburgh & Lothians Greenspace Trust	N
Esk Valley Trust	Y
Falkirk Council	Y
FCS	Y
Fife Coast & Countryside Trust	Y
Fife Council	Y
Forestry Commission Scotland	Y
Forest Enterprise	N
Forest Research	N
Forth District Salmon Fisheries Board	N
Forth Estuary Forum	N
Forth Ports Plc	N
Historic Scotland	N
Hopetoun Estate	N
LFGNP	N
Loch Lomond & the Trossachs National Park	Y
Lothians & Fife Green Network Partnership	Y
Midlothian Council	Y
National Farmers Union Scotland	N
Native Woodland Survey Programme Manager	N
North Lanarkshire Council	N
NTS	N
Oatridge College	N
Perth & Kinross Council	N
RFFT	Y
River Avon Federation	N
River Carron Fisheries Management Group	N
River Forth Fishery at Stirling	N
RSPB	Y
SAC	N
Scottish Borders Council	N
Scottish Government	N
Scottish Water	N

Organisation	Attended (Y/N)
SEPA	Y
SGRPID	N
Slamannan Angling Club	Y
SNH	Y
SRPBA	N
Stirling Council	Y
SWT	N
SWT Reserves Manager	N
The Coal Authority	N
The Leven Trust	Y
Tweed Forum	Y
UK Major Ports	N
Water of Leith Conservation Trust	Y
West Lothian Council	Y

2.5.3 Collation of workshop information

Feedback was requested from the stakeholders in three formats; the review of posters showing the initial opportunity areas, questionnaires filled in during the workshop by individual teams and individual questions completed following the workshop.

Posters

The initial opportunity areas were mapped by Local Authority Area and the workshop attendees were asked to group themselves by their area of local knowledge. The attendees were asked to annotate the maps with any pieces of local knowledge they with regards to their thought on the initial opportunity areas, ongoing projects that they were aware of and identification of areas were they deemed restoration of the water environment would have multiple benefits.

Workshop Questionnaires

In addition to reviewing the posters each group were asked to complete a questionnaire posed to the attendees were as follows:

1. Discussion of Sites Highlighted During the Initial Opportunity Area Screening Using Habitats – Step 2
    a. As a group what are your thoughts on the initial opportunity areas?
    b. Do you have an area in mind where the restoration of the water environment could result in multiple benefits?
    c. Are these areas identified within this screening analysis?
    d. If not please let us know where these sites are.
    e. Are you currently working on any relevant projects that overlap with the aims of this project?
    f. As a group is there any dataset you know are available that we have not used within this study and may be of benefit?
2. Discussion of Initial Ranking Undertaken in Step 4
    a. As a group what are your thoughts on the initial ranking procedure and opportunity areas resulting from Step 4 of the analysis?
3. Discussion of Initial Ranking Undertaken in Step 4a
    a. As a group what are your thoughts on the initial ranking procedure and opportunity areas resulting from Step 4a of the analysis?

Post Workshop Questionnaire

1. Do you have an area in mind where the restoration of the water environment could result in multiple benefits?
2. Are you currently working on any relevant projects that overlap with the aims of this project?

3. Are you able to provide any further datasets which would be of benefit to this study that we have not included so far?
4. Considering your local knowledge, what are your thoughts on the initial opportunity areas presented as a result of Step 2?
5. What are your thoughts on the initial ranking procedure and areas presented to you in the workshop?
6. Do you feel there should be weighting applied to particular opportunity datasets?

Collation of the workshop feedback datasets are shown in Appendix E. This data was then used within step 4 as a reality check against the GIS screening and MCA.

3 Conclusions and Recommendations

3.1 Ranking Analysis - Recommendation of Sites for Selection

By considering each of these test sets of weighting ratios, it can be seen that the water bodies which feature in each of the top 30 are very similar but vary slightly in their ranked positions. Weighting Test 5 gives greatest weighting to the Environmental and WFD pressure parameter groups and least priority to the flood risk grouping, hence giving greatest priority to the main objectives of this study. Greater weighting is also given to the aerial photography analysis and the number of opportunity areas within a water body. This has therefore been taken forward as the final ranking scheme used to identify the Phase 2 study reaches.

The top 12 ranked water bodies using this ranking scheme are detailed below in Table 4-1.

Table 3-1: Top 12 ranked water bodies

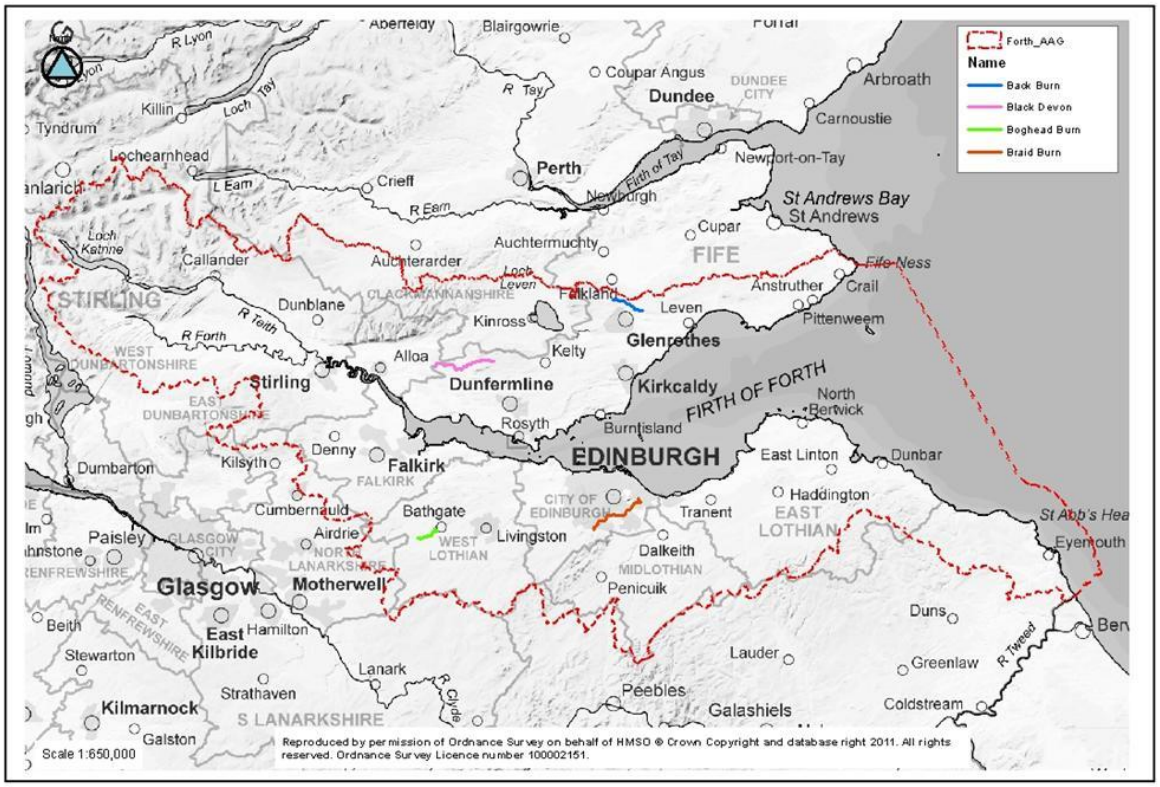
Rank	Water body
1	Kennoway Burn/Back Burn
2	Braid Burn (Upstream Dreghorn Barracks to Portobello)
3	River Almond (Maitland Bridge to Cramond)
4	Black Devon (Source to Birkhill Plantation)
5	Keith Water/Fala Dam Burn
6	River Avon (Source to Jawhills)
7	Linhouse water/Camilty Burn/ Green Burn
8	Boghead Burn/Bog Burn/Couston Water
9	Black Devon (Birkhill Plantation to Forth Estuary)
10	River Almond (Source to Foulshiels Burn confluence)
11	River Leven (Loch Leven to Markinch)
12	Loch Leven

3.2 Selection of Study Reaches

The project steering group (SEPA, CSGN, Forestry Commission & SNH) and Forth AAG considered the top ranked sites detailed within Table 4-1 and as a result the following watercourse reaches have been selected to take forward into Phase 2 of the project (see also Figure 4-1).

- The **Braid Burn** which flows through Edinburgh and is a highly urbanised catchment and is influenced by diffuse pollution, combined sewer overflows and the newly constructed Braid Burn Flood Prevention Scheme.
- The **Black Devon** which is predominantly rural in nature flowing through farmland with influences from mining.
- The **Boghead Burn** which is a low energy watercourse and has been highly influenced by anthropogenic processes including mining and watercourse diversion and straightening.
- The **Kennoway/Back Burn** which is rural in nature in it upper reaches with arable farming and patches of forestry plantation. The watercourse then reaches Glenrothes where the impacts of urban expansion are evident.

Figure 3-1: Phase 2 Study Reaches



Phase 2 of the project will involve identifying restoration sites and developing restoration sites and this through this process aiming to:

- Expand green/ecological networks
- Help achieve river basin planning objectives including the achievement of good ecological status / potential
- Identify projects that can contribute to addressing flood risk (with the emphasis on natural flood management)
- Tackle invasive non-native species
- Help with adaptation to climate change
- Help to raise awareness of the benefits of a healthy water environment
- Increase public access

Information on this project can be viewed on SEPA's website[10]. The next steps for the steering group will be to:

- Use the scoping reports for the 4 sites to develop projects to deliver the on-the-ground improvements identified;
- Promote the outputs of the project by sharing the list of opportunity areas and shapefiles with a range of stakeholders in the Forth, together with an explanation of how they could be used;
- Work with partners to identify opportunities to take forward and integrate with other plans and projects. For example, there are opportunities to link with a Lothian and Fife Green Network Partnership project to progress the habitat enhancement/restoration opportunities on the Braid Burn and potential Life+ projects under development.

[10]http://www.sepa.org.uk/water/river_basin_planning/area_advisory_groups/forth/forth_multiple_benefits_projec.aspx

3.3 Discussion

The project developed and improved methodologies piloted within the Clyde catchment to achieve multiple benefits through good RBMP. This made a useful guide for this project. The report itself highlights that while producing the methodology it was recognised that it may not be appropriate to apply exactly the same steps and same data elsewhere. Therefore the following improvements were made to the protocol:

- Including all opportunity areas within the multi-criteria analysis (MCA) rather than removing data at an early stage through simple screening.
- The inclusion of a high level hydromorphic audit using aerial imagery within the MCA.

The opportunity area screening can only be as good as the data made available or existing at the time of analysis. This is further complicated by the fact that there are many different data sources (Local Authorities, Government Bodies and Land Owners) and formats to be dealt with. The analysis has proved possible for the Forth Catchment using GIS based analysis and creation of an MCA. This format will also allow future updates if deemed advantageous.

The GIS collation of data and MCA undertaken during this study has provided a useful tool for identifying areas of potential restoration opportunity. However, the initial opportunity areas were linked to the Integrated Habitat Network datasets representing Broadleaved & Yew Woodland; Fen, March & Swamp; and Neutral Grassland areas only. This does not mean however that there are not opportunities to increase habitat diversity outside of these opportunity areas.

Furthermore dovetailing of IHN opportunities with wider WFD restoration requirements proved difficult; often restoration is required outside of IHN areas. IHN extension / improvement alone may not relieve sufficient pressures to achieve good ecological status / potential. The local audits were undertaken for river reaches extending beyond the IHN opportunity areas and these show that the high level process (necessarily) fails to identify all opportunities and constraints on the ground, highlighting that site walkover is an important step in the process.

The methodology followed was useful to identify and prioritise river reaches where multiple benefits may be achieved at whole river level. Thus identifying 'quick wins' at a whole river level and multiple benefits well, which is something currently missed by many of the local restoration initiatives currently being funded, where the wider picture is not necessarily covered. Stakeholder engagement throughout this project has been vital and where possible incorporated into the decision making process.

By adding a high level hydromorphic audit for each opportunity area into the ranking procedure using aerial imagery from Google Earth the methodology now includes a further sensibility check prior to ground truthing. The opportunity ranking gained from this procedure agreed well with a qualitative assessment made during the aerial photograph analysis based on an overall impression of each channel system.

During the MCA analysis a sensitivity type analysis was undertaken with respect to varying the weighting given to different parameter groupings. This showed that in this case the top 30 water bodies vary little apart from in their ranking. This sensitivity analysis provides transparency to the steering group when justifying their choices of watercourse to take on to further assessment, however in future assessments this analysis could be simplified. The MCA and ability to adjust parameter group weightings also allows future changes in priority drivers to be assessed.

The derivation of restoration plans will be undertaken during Phase 2 of the project. However at this stage it is clear that a filtering stage will be necessary before detailed design and implementation are undertaken to avoid excess economic analysis being carried out prior to restoration plan finalisation.

3.4 Conclusions

Application of the improved protocol to assess multiple benefits to optimise river restoration in the Forth Sub Basin District has revealed a number of conclusions and recommendations which are summarised below:

- Original Clyde methodology filtered significant pressure variables at an early stage removing them from the selection process.
- A GIS based multi-criteria analysis allows all variables to remain in the analysis when selecting optimal restoration rivers.
- The approach yielded similar key rivers for the Forth Sub Basin regardless of pressure / opportunity weighting.
- Screening could be improved by including abstraction, discharge and SuDS data and hence applying greater coverage to the point source pollution assessment.
- A high level hydromorphological assessment yielded similar rivers to those determined by the MCA and provided useful validation especially where restoration is based on physical characteristics alone.
- Care should be exercised when assessing each favoured river for local restoration options as mismatches are possible when comparing local objectives with those of the Water Framework Directive.
- Datasets which were not available at the time of assessment but could be included within future assessments include SEPA Wetland Inventory, SEPA Pluvial Flood Map, SEPA Preliminary Flood Risk Assessment datasets, SuDS datasets and point source pollution data.

A Figures

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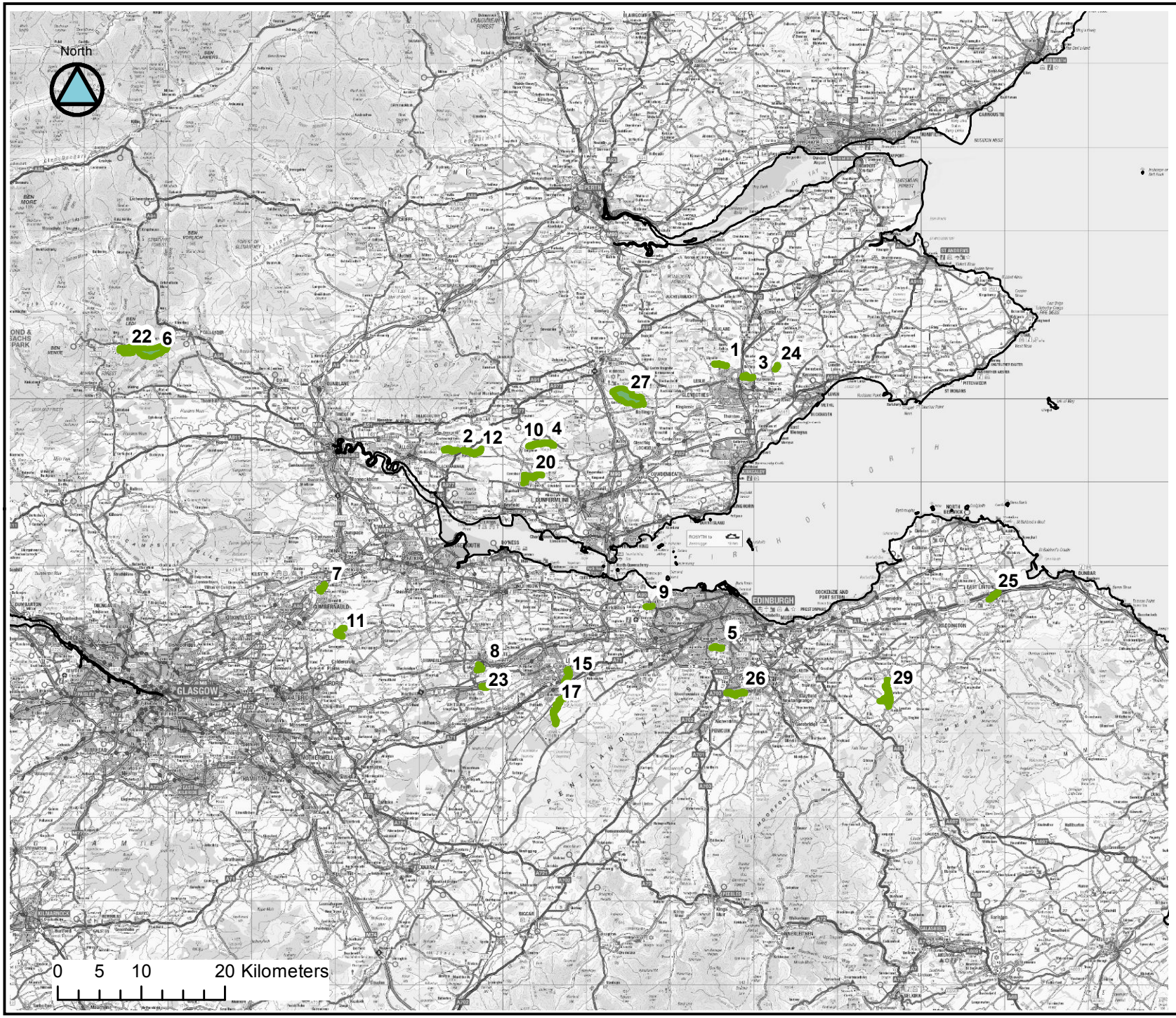
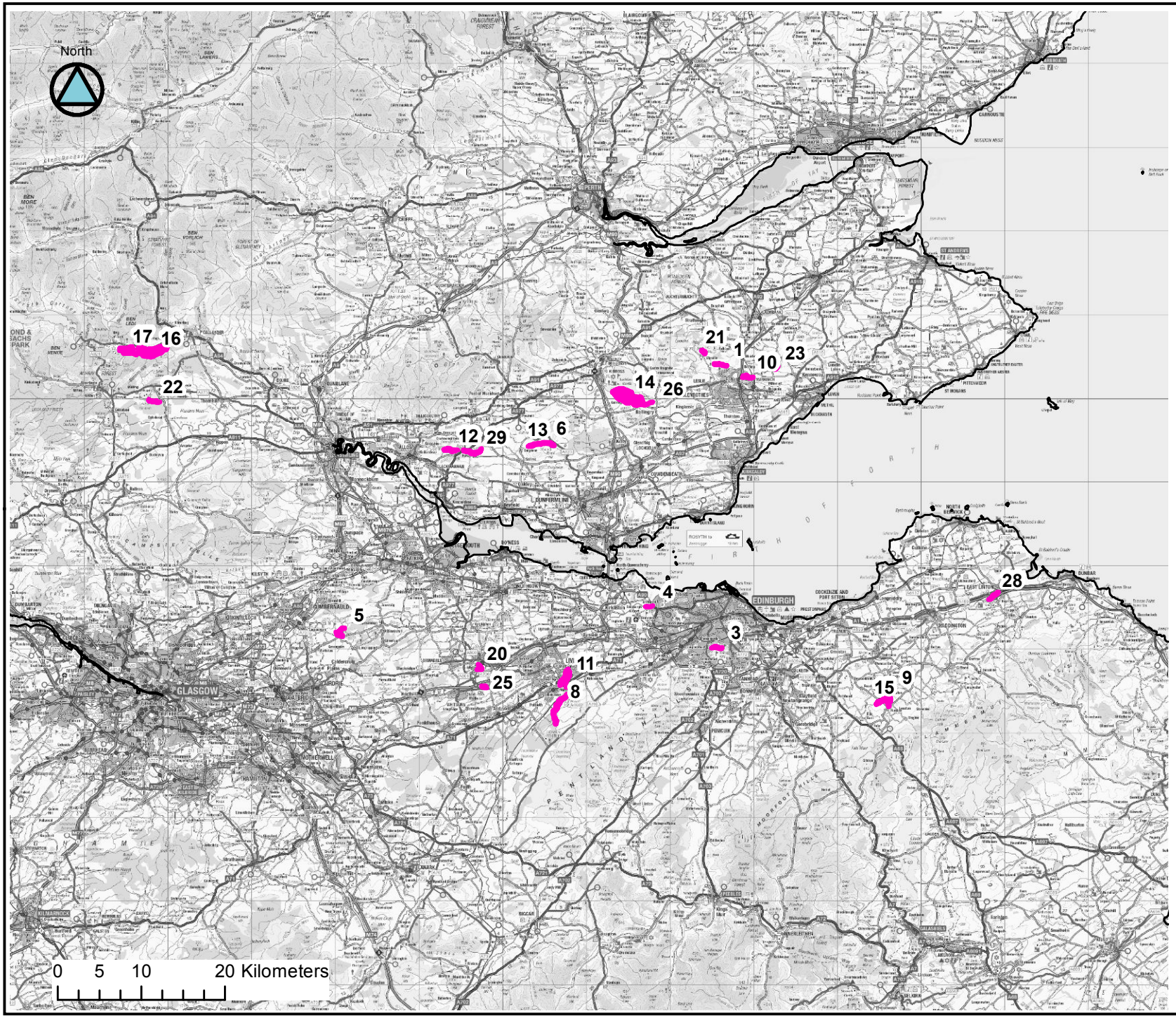


LEGEND

No Weighting

Distribution of Top 30 Results Filtered by Weighting Criteria (labelled by rank).

Figure A-1 - No Weighting

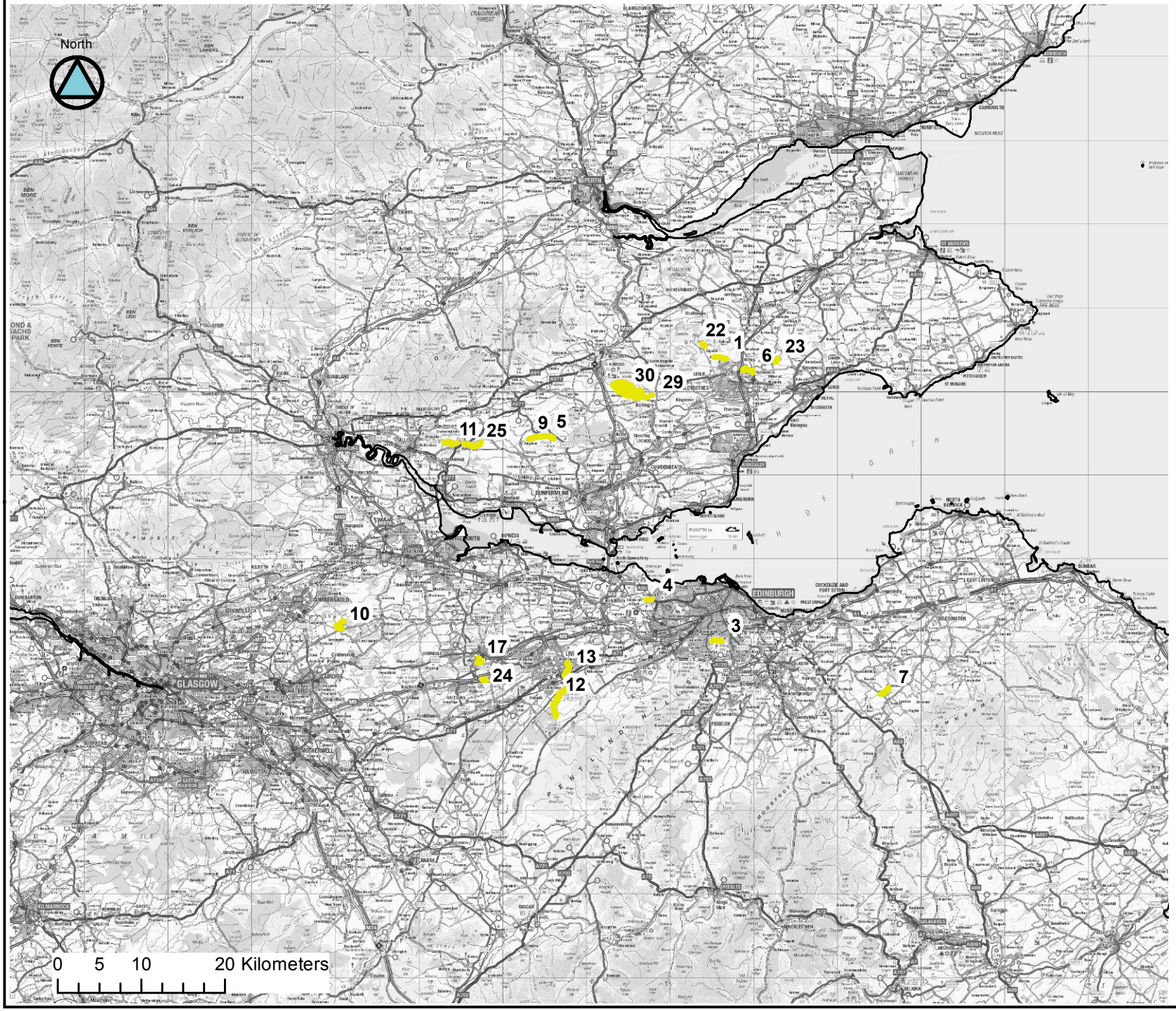


LEGEND

Weighting group 1

Distribution of Top 30 Results Filtered by Weighting Criteria (labelled by rank).

Figure A-2 - Weighting Test No. 1

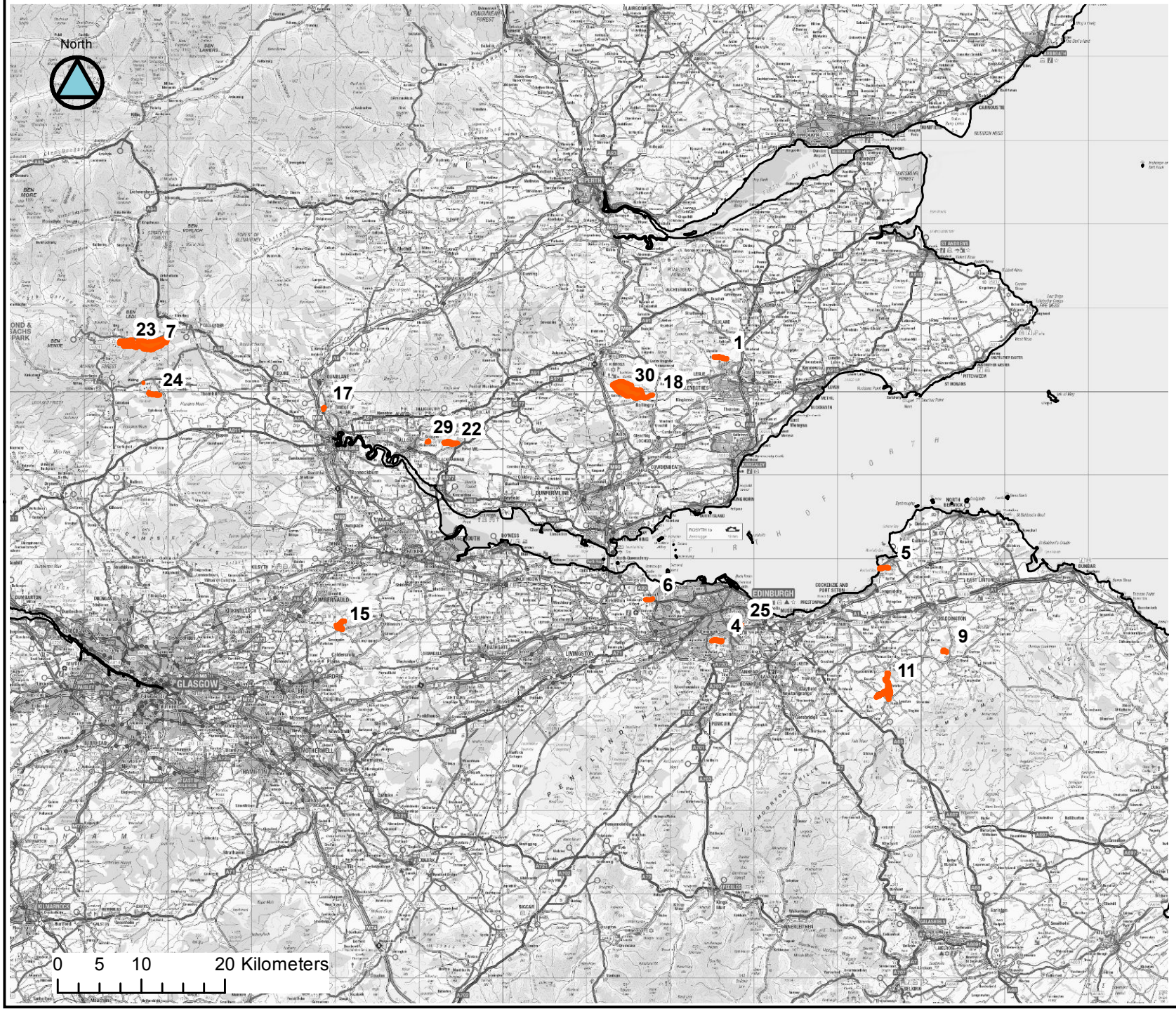


LEGEND

Weighting group 2

Distribution of Top 30 Results Filtered by Weighting Criteria (labelled by rank).

Figure A-3 - Weighting Test No. 2

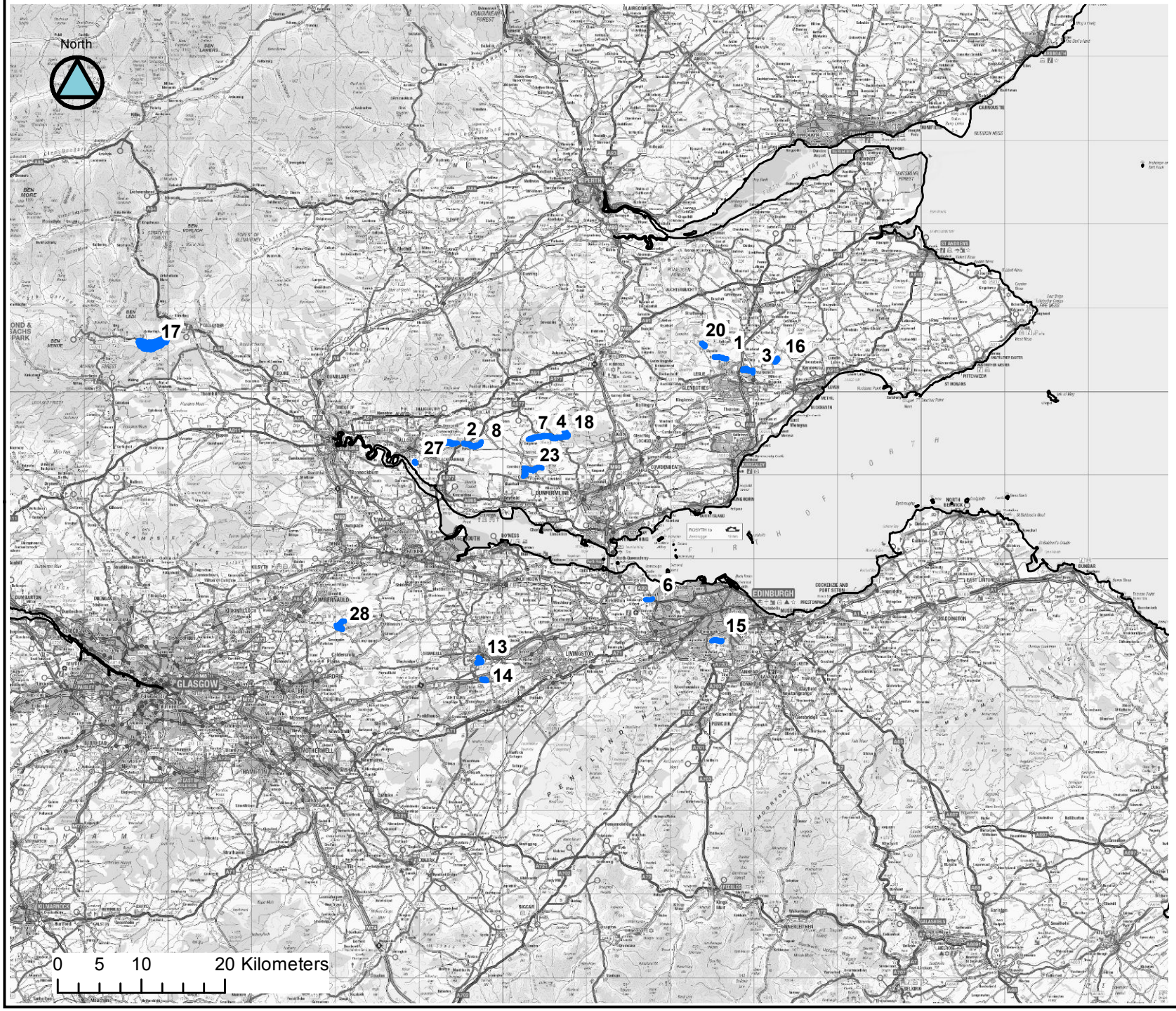


LEGEND

Weighting group 3

Distribution of Top 30 Results Filtered by Weighting Criteria (labelled by rank).

Figure A-4 - Weighting Test No. 3

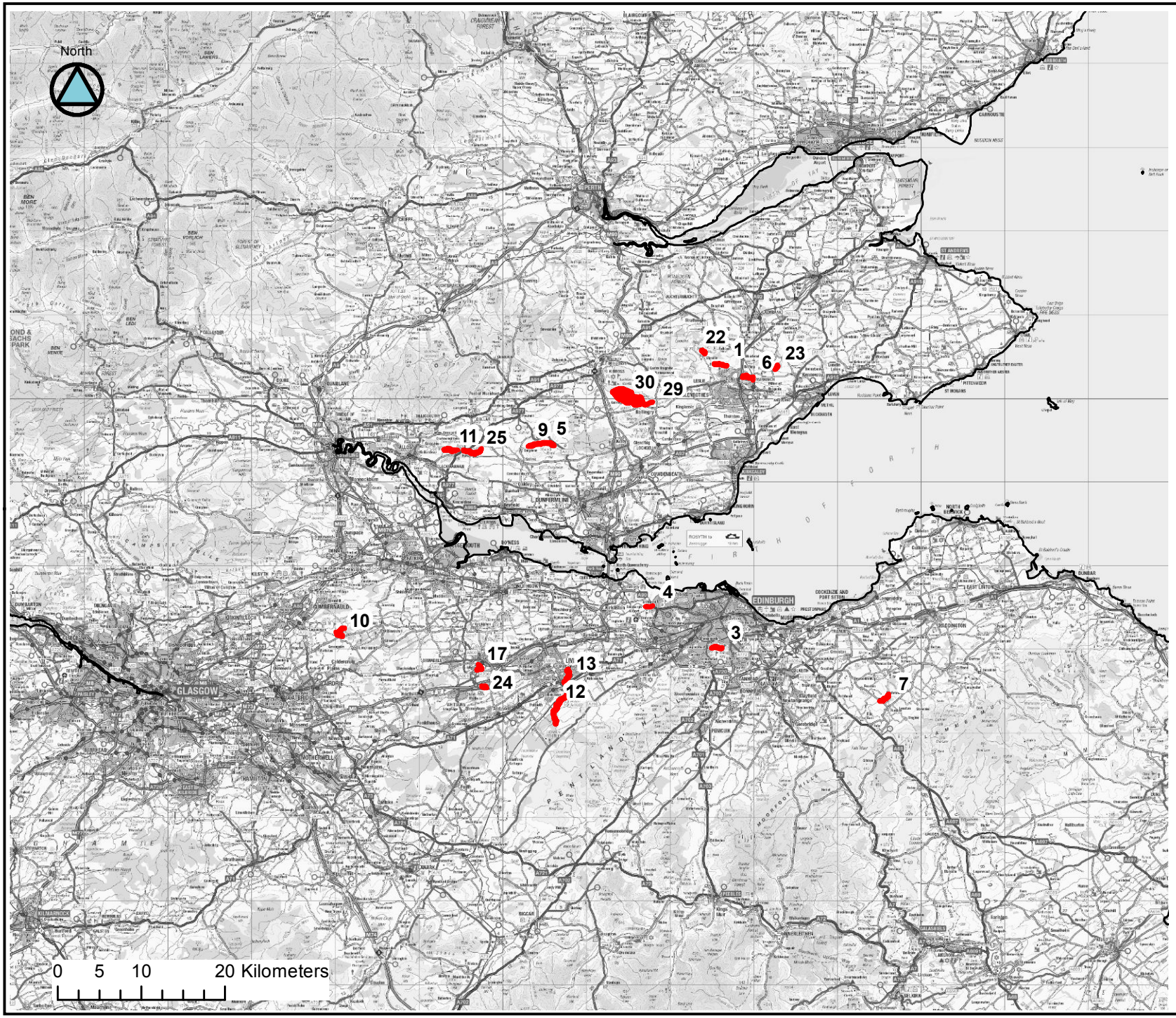


LEGEND

Weighting group 4

Distribution of Top 30 Results Filtered by Weighting Criteria (labelled by rank).

Figure A-5 - Weighting Test No. 4



LEGEND

Weighting group 5

Distribution of Top 30 Results Filtered by Weighting Criteria (labelled by rank).

Figure A-6 - Weighting Test No. 5

B List of Opportunity Areas Grouped by Local Authority

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Water Body	Pressure IHN	Unique ID	Local Authority
Black Devon (Source to Birkhill Plantation)	RuralDP_FMS	4_4403_RuralDP_FMS_301659_694309	Clackmannanshire
Black Devon (Birkhill Plantation to Forth Estuary)	RuralDP_BYW	5_4402_RuralDP_BYW_293195_693906	Clackmannanshire
Black Devon (Source to Birkhill Plantation)	RuralDP_BYW	6_4403_RuralDP_BYW_300582_694232	Clackmannanshire
Black Devon (Source to Birkhill Plantation)	RuralDP_FMS	23_4403_RuralDP_FMS_301659_694309	Clacks/Fife
Black Devon (Birkhill Plantation to Forth Estuary)	RuralDP_FMS	3_4402_RuralDP_FMS_293160_693900	Clackmannanshire
Gartmorn Dam	RuralDP_BYW	12_100276_RuralDP_BYW_292508_694464	Clackmannanshire
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	24_4403_RuralDP_NG_304235_694573	Clackmannanshire
Black Devon (Birkhill Plantation to Forth Estuary)	RuralDP_NG	2_4402_RuralDP_NG_289504_691547	Clackmannanshire
Brothie Burn (Gartmorn Reservoir to Forth Estuary)	Morph_BYW	9_6908_Morph_BYW_291041_694021	Clackmannanshire
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	8_4403_RuralDP_NG_304235_694573	Clackmannanshire
Brothie Burn (Gartmorn Reservoir to Forth Estuary)	RuralDP_BYW	10_6908_RuralDP_BYW_291041_694022	Clackmannanshire
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	166_4403_RuralDP_NG_304235_694573	Clackmannanshire
Gartmorn Dam	RuralDP_BYW	7_100276_RuralDP_BYW_292508_694464	Clackmannanshire
Gartmorn Dam	RuralDP_BYW	11_100276_RuralDP_BYW_292508_694464	Clackmannanshire
Keith Water/Fala Dam Burn	RuralDP_BYW	43_4011_RuralDP_BYW_343929_662456	East Lothian
Birns Water/Humbie Water	RuralDP_BYW	42_4008_RuralDP_BYW_346149_663804	East Lothian
River Tyne (Birns Water confluence to Estuary)	RuralDP_NG	52_4000_RuralDP_NG_358528_676384	East Lothian
Keith Water/Fala Dam Burn	RuralDP_FMS	248_4011_RuralDP_FMS_343172_661747	East Lothian
Gifford Water	RuralDP_BYW	47_4005_RuralDP_BYW_354747_667304	East Lothian
Gosford Burn	Morph_BYW	64_3913_Morph_BYW_345567_678972	East Lothian
Colstoun Water	RuralDP_BYW	46_4004_RuralDP_BYW_352240_669444	East Lothian
Birns Water	RuralDP_BYW	44_4010_RuralDP_BYW_346641_665673	East Lothian
Gosford Burn	Morph_BYW	63_3913_Morph_BYW_346361_679093	East Lothian
Spott Burn	RuralDP_NG	68_3903_RuralDP_NG_367444_675331	East Lothian
River Esk	RuralDP_NG	99_3800_RuralDP_NG_334090_671809	East Lothian
River Tyne (Birns Water confluence to Estuary)	RuralDP_NG	53_4000_RuralDP_NG_358528_676384	East Lothian
Gifford Water	RuralDP_BYW	61_4005_RuralDP_BYW_354747_667304	East Lothian
Gosford Burn	Morph_BYW	65_3913_Morph_BYW_344999_679014	East Lothian
East Peffer	RuralDP_NG	58_3910_RuralDP_NG_351284_676429	East Lothian
East Peffer	Morph_NG	57_3910_Morph_NG_351500_676517	East Lothian
Spott Burn	RuralDP_NG	67_3903_RuralDP_NG_367444_675331	East Lothian
Spott Burn	RuralDP_NG	66_3903_RuralDP_NG_367444_675331	East Lothian

Water Body	Pressure IHN	Unique ID	Local Authority
Back Burn	RuralDP_BYW	56_4003_RuralDP_BYW_346592_673112	East Lothian
East Peffer	Morph_BYW	78_3910_Morph_BYW_358009_679428	East Lothian
Pilmuir Burn	Morph_NG	76_3911_Morph_NG_361593_683187	East Lothian
Bearford Burn/Morham Burn	RuralDP_NG	48_4002_RuralDP_NG_354753_672912	East Lothian
East Peffer	RuralDP_BYW	79_3910_RuralDP_BYW_358008_679446	East Lothian
Eye Water (Source to Ale Water Confluence)	RuralDP_FMS	73_5011_RuralDP_FMS_372685_667713	East Lothian
Back Burn	RuralDP_BYW	55_4003_RuralDP_BYW_346592_673112	East Lothian
Eye Water (Source to Ale Water Confluence)	RuralDP_FMS	74_5011_RuralDP_FMS_372685_667713	East Lothian/Borders
Pilmuir Burn	RuralDP_NG	77_3911_RuralDP_NG_361607_683210	East Lothian
Bearford Burn/Morham Burn	RuralDP_NG	49_4002_RuralDP_NG_354753_672912	East Lothian
Sauchet Water	RuralDP_FMS	71_3907_RuralDP_FMS_361740_670538	East Lothian
Gosford Burn	Morph_BYW	45_3913_Morph_BYW_347876_679080	East Lothian
Spott Burn	RuralDP_FMS	69_3903_RuralDP_FMS_364939_671162	East Lothian
Bearford Burn/Morham Burn	RuralDP_FMS	51_4002_RuralDP_FMS_353968_669313	East Lothian
Birns Water	RuralDP_NG	54_4010_RuralDP_NG_349951_663587	East Lothian
Bearford Burn/Morham Burn	RuralDP_NG	50_4002_RuralDP_NG_354753_672912	East Lothian
Luggat Burn	Morph_NG	59_3906_Morph_NG_359458_674167	East Lothian
Luggat Burn	Morph_NG	60_3906_Morph_NG_357387_673169	East Lothian
Gifford Water	RuralDP_FMS	62_4005_RuralDP_FMS_355659_663505	East Lothian
Sauchet Water	RuralDP_NG	70_3907_RuralDP_NG_361625_672799	East Lothian
Braid Burn (Upstream Dreghorn Barracks to Portobello)	UrbanDP_NG	91_3500_UrbanDP_NG_325601_670271	City of Edinburgh
River Almond (Maitland Bridge to Cramond)	RuralDP_BYW	102_3000_RuralDP_BYW_317454_675179	City of Edinburgh
Braid Burn (Upstream Dreghorn Barracks to Portobello)	Morph_NG	90_3500_Morph_NG_325018_670249	City of Edinburgh
Braid Burn (Upstream Dreghorn Barracks to Portobello)	Morph_NG	84_3500_Morph_NG_326150_670194	City of Edinburgh
River Almond (Maitland Bridge to Cramond)	RuralDP_NG	100_3000_RuralDP_NG_317477_675150	City of Edinburgh
River Almond (Maitland Bridge to Cramond)	Morph_BYW	101_3000_Morph_BYW_317893_675258	City of Edinburgh
Braid Burn (Upstream Dreghorn Barracks to Portobello)	Morph_FMS	95_3500_Morph_FMS_328480_672074	City of Edinburgh
Burdiehouse Burn/Swanston Burn	Morph_NG	97_3600_Morph_NG_332543_673004	City of Edinburgh
Braid Burn (Upstream Dreghorn Barracks to Portobello)	UrbanDP_FMS	96_3500_UrbanDP_FMS_328470_672086	City of Edinburgh
River Almond (Maitland Bridge to Cramond)	Morph_BYW	103_3000_Morph_BYW_317077_675192	City of Edinburgh
Burdiehouse Burn/Swanston Burn	RuralDP_NG	98_3600_RuralDP_NG_332549_673006	City of Edinburgh
Burdiehouse Burn/Swanston Burn	RuralDP_FMS	89_3600_RuralDP_FMS_323066_666941	City of Edinburgh

Water Body	Pressure IHN	Unique ID	Local Authority
Gogar Burn (Source to Union Canal)	RuralDP_BYW	94_3005_RuralDP_BYW_315507_669427	City of Edinburgh
Murray Burn	UrbanDP_BYW	93_3701_UrbanDP_BYW_314646_667435	City of Edinburgh
Burdiehouse Burn/Swanston Burn	Morph_FMS	87_3600_Morph_FMS_323144_667073	City of Edinburgh
Burdiehouse Burn/Swanston Burn	Morph_FMS	88_3600_Morph_FMS_323349_667249	City of Edinburgh
Murray Burn	Morph_BYW	92_3701_Morph_BYW_314851_667504	City of Edinburgh
Union canal (Falkirk Wheel to Greenbank)	Morph_BYW	109_4_Morph_BYW_285324_679923	Falkirk
Bonny Water/Red Burn	UrbanDP_FMS	268_4205_UrbanDP_FMS_279285_678039	Falkirk/N Lanarkshire
Bonny Water/Red Burn	UrbanDP_NG	114_4205_UrbanDP_NG_281847_679837	Falkirk
Bonny Water/Red Burn	UrbanDP_FMS	115_4205_UrbanDP_FMS_279285_678039	Falkirk
Grange Burn/Westquarter Burn	Morph_BYW	106_3300_Morph_BYW_285688_677935	Falkirk
Union canal (Falkirk Wheel to Greenbank)	Morph_BYW	108_4_Morph_BYW_285324_679923	Falkirk
Union canal (Falkirk Wheel to Greenbank)	Morph_BYW	107_4_Morph_BYW_285324_679923	Falkirk
River Carron (Bonny Water confluence to Carron Estuary)	UrbanDP_FMS	112_4200_UrbanDP_FMS_287920_682366	Falkirk
River Carron (Bonny Water confluence to Carron Estuary)	Morph_FMS	111_4200_Morph_FMS_288028_682414	Falkirk
River Carron (Bonny Water confluence to Carron Estuary)	UrbanDP_FMS	113_4200_UrbanDP_FMS_287920_682366	Falkirk
Kennoway Burn/Back Burn	RuralDP_BYW	238_6303_RuralDP_BYW_327655_703302	Fife
Kennoway Burn/Back Burn	Morph_BYW	236_6303_Morph_BYW_326604_703959	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_FMS	161_4403_RuralDP_FMS_301659_694309	Fife
Kennoway Burn/Back Burn	RuralDP_BYW	225_6303_RuralDP_BYW_327655_703302	Fife
Kennoway Burn/Back Burn	Morph_BYW	1_6303_Morph_BYW_328733_702676	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	158_4403_RuralDP_NG_304235_694573	Fife
Kennoway Burn/Back Burn	Morph_BYW	223_6303_Morph_BYW_329565_702514	Fife
Kennoway Burn/Back Burn	Morph_BYW	0_6303_Morph_BYW_328664_702590	Fife
Kennoway Burn/Back Burn	RuralDP_FMS	235_6303_RuralDP_FMS_328063_704726	Fife
Kennoway Burn/Back Burn	RuralDP_FMS	232_6303_RuralDP_FMS_328063_704726	Fife
Kennoway Burn/Back Burn	Morph_BYW	222_6303_Morph_BYW_329931_702288	Fife
Kennoway Burn/Back Burn	RuralDP_BYW	224_6303_RuralDP_BYW_327655_703302	Fife
Grange Burn	RuralDP_NG	136_4302_RuralDP_NG_302024_689990	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_FMS	194_4403_RuralDP_FMS_301659_694309	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_BYW	162_4403_RuralDP_BYW_300582_694232	Fife
Kennoway Burn/Back Burn	Morph_BYW	237_6303_Morph_BYW_325250_704159	Fife
Kennoway Burn/Back Burn	Morph_FMS	229_6303_Morph_FMS_332625_703532	Fife

Water Body	Pressure IHN	Unique ID	Local Authority
Grange Burn	RuralDP_BYW	140_4302_RuralDP_BYW_301917_689576	Fife
Kennoway Burn/Back Burn	Morph_FMS	230_6303_Morph_FMS_332812_703900	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_NG	149_4301_RuralDP_NG_304797_691686	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	160_4403_RuralDP_NG_304235_694573	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	159_4403_RuralDP_NG_304235_694573	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	191_4403_RuralDP_NG_304235_694573	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	163_4403_RuralDP_NG_304235_694573	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_BYW	153_4301_RuralDP_BYW_302508_691460	Fife
Lochfitty Burn	RuralDP_FMS	182_6307_RuralDP_FMS_315858_694006	Fife
Kennoway Burn/Back Burn	RuralDP_NG	234_6303_RuralDP_NG_323757_705781	Fife
Lochfitty Burn	RuralDP_BYW	197_6307_RuralDP_BYW_316937_694905	Fife
Grange Burn	RuralDP_NG	118_4302_RuralDP_NG_302024_689990	Fife
Grange Burn	RuralDP_BYW	135_4302_RuralDP_BYW_301917_689576	Fife
Kennoway Burn/Back Burn	Morph_FMS	233_6303_Morph_FMS_324151_705405	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_FMS	192_4403_RuralDP_FMS_301659_694309	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_BYW	165_4403_RuralDP_BYW_300582_694232	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	186_4403_RuralDP_NG_304235_694573	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_NG	141_4301_RuralDP_NG_304797_691686	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_NG	148_4301_RuralDP_NG_304797_691686	Fife
Grange Burn	RuralDP_FMS	137_4302_RuralDP_FMS_301663_689840	Fife
Lochfitty Burn	RuralDP_NG	181_6307_RuralDP_NG_316067_694306	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_FMS	164_4403_RuralDP_FMS_301659_694309	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_BYW	150_4301_RuralDP_BYW_302508_691460	Fife
River Ore (Loch Ore to Cardenden)	RuralDP_NG	178_6305_RuralDP_NG_319465_695216	Fife
Lyne Burn	RuralDP_BYW	126_6907_RuralDP_BYW_308515_686655	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_BYW	145_4301_RuralDP_BYW_302508_691460	Fife
River Ore (Loch Ore to Cardenden)	RuralDP_FMS	179_6305_RuralDP_FMS_319294_695149	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_BYW	144_4301_RuralDP_BYW_302508_691460	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_BYW	146_4301_RuralDP_BYW_302508_691460	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_FMS	142_4301_RuralDP_FMS_305542_691969	Fife
Kennoway Burn/Back Burn	RuralDP_FMS	231_6303_RuralDP_FMS_328063_704726	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_BYW	152_4301_RuralDP_BYW_302508_691460	Fife

Water Body	Pressure IHN	Unique ID	Local Authority
Bluther Burn (Source to Gibsley Farm)	RuralDP_FMS	143_4301_RuralDP_FMS_305542_691969	Fife
Black Devon (Source to Birkhill Plantation)	RuralDP_NG	193_4403_RuralDP_NG_304235_694573	Fife
Grange Burn	RuralDP_BYW	138_4302_RuralDP_BYW_301917_689576	Fife
Grange Burn	RuralDP_BYW	139_4302_RuralDP_BYW_301917_689576	Fife
Loch Ore	RuralDP_BYW	198_100274_RuralDP_BYW_316215_695481	Fife
Loch Ore	RuralDP_FMS	196_100274_RuralDP_FMS_316428_695523	Fife
Lochfitty Burn	RuralDP_FMS	195_6307_RuralDP_FMS_315858_694006	Fife
Lochty Burn	RuralDP_BYW	218_6312_RuralDP_BYW_326390_698481	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_FMS	147_4301_RuralDP_FMS_305542_691969	Fife
Bluther Burn (Source to Gibsley Farm)	RuralDP_BYW	151_4301_RuralDP_BYW_302508_691460	Fife
Kelty Burn	Morph_BYW	187_6306_Morph_BYW_312571_694982	Fife / Perth & Kinross
Kelty Burn	Morph_BYW	188_6306_Morph_BYW_313055_695194	Fife / Perth & Kinross
Meldrums Mill Burn/Linn Burn	RuralDP_FMS	129_6308_RuralDP_FMS_308107_692249	Fife
Kennoway Burn/Back Burn	Morph_FMS	228_6303_Morph_FMS_332710_703441	Fife
River Ore (Cardenden to River Leven)	RuralDP_BYW	205_6304_RuralDP_BYW_332339_699009	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_FMS	132_6308_RuralDP_FMS_308107_692249	Fife
Brankholme Burn	RuralDP_NG	123_4310_RuralDP_NG_310792_684659	Fife
Grange Burn	RuralDP_FMS	119_4302_RuralDP_FMS_301663_689840	Fife
Den Burn/Lochgelly Burn	Morph_FMS	173_6311_Morph_FMS_319342_692282	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_BYW	130_6308_RuralDP_BYW_308659_691549	Fife
Loch Ore	RuralDP_BYW	199_100274_RuralDP_BYW_316215_695481	Fife
Brankholme Burn	Morph_NG	121_4310_Morph_NG_310656_684664	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_BYW	131_6308_RuralDP_BYW_308659_691549	Fife
Brankholme Burn	Morph_NG	122_4310_Morph_NG_310939_684676	Fife
Lochfitty Burn	RuralDP_FMS	180_6307_RuralDP_FMS_315858_694006	Fife
Lochfitty Burn	RuralDP_FMS	184_6307_RuralDP_FMS_315858_694006	Fife
Tiel Burn	RuralDP_BYW	175_6882_RuralDP_BYW_319920_689484	Fife
Lochty Burn	Morph_NG	210_6312_Morph_NG_318395_697831	Fife / Perth & Kinross
Loch Gelly	RuralDP_FMS	176_100277_RuralDP_FMS_320095_692470	Fife
Dronachy Burn	RuralDP_FMS	172_6883_RuralDP_FMS_324877_691230	Fife
Dronachy Burn	RuralDP_FMS	167_6883_RuralDP_FMS_324877_691230	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_NG	127_6308_RuralDP_NG_307400_692552	Fife

Water Body	Pressure IHN	Unique ID	Local Authority
Lochty Burn	RuralDP_NG	212_6312_RuralDP_NG_318453_697836	Fife / Perth & Kinross
Meldrums Mill Burn/Linn Burn	RuralDP_NG	128_6308_RuralDP_NG_307400_692552	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_NG	134_6308_RuralDP_NG_307400_692552	Fife
Loch Fitty	RuralDP_FMS	185_100278_RuralDP_FMS_312090_691361	Fife
Lochty Burn	Morph_NG	211_6312_Morph_NG_318860_697870	Fife
Lyne Burn	RuralDP_BYW	125_6907_RuralDP_BYW_308515_686655	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_FMS	154_6308_RuralDP_FMS_308107_692249	Fife
Cocklemill Burn/Den Burn (Source to Saw Mill Bridge)	RuralDP_BYW	221_4320_RuralDP_BYW_347518_705225	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_FMS	133_6308_RuralDP_FMS_308107_692249	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_FMS	155_6308_RuralDP_FMS_308107_692249	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_FMS	157_6308_RuralDP_FMS_308107_692249	Fife
Den Burn/Lochgelly Burn	Morph_FMS	170_6311_Morph_FMS_316590_691022	Fife
Lyne Burn	Morph_BYW	124_6907_Morph_BYW_313620_689101	Fife
Loch Fitty	Morph_FMS	183_100278_Morph_FMS_312090_691361	Fife
Dronachy Burn	RuralDP_BYW	168_6883_RuralDP_BYW_325855_691365	Fife
Lochty Burn	RuralDP_NG	213_6312_RuralDP_NG_318453_697836	Fife
Tiel Burn	RuralDP_FMS	171_6882_RuralDP_FMS_322114_690126	Fife
River Ore (Cardenden to River Leven)	RuralDP_BYW	204_6304_RuralDP_BYW_332339_699009	Fife
River Ore (Loch Ore to Cardenden)	RuralDP_BYW	177_6305_RuralDP_BYW_320601_694807	Fife
Dour Burn	RuralDP_FMS	116_4313_RuralDP_FMS_318683_685679	Fife
Meldrums Mill Burn/Linn Burn	RuralDP_FMS	156_6308_RuralDP_FMS_308107_692249	Fife
Tiel Burn	RuralDP_FMS	174_6882_RuralDP_FMS_322114_690126	Fife
Kelty Burn	Morph_BYW	190_6306_Morph_BYW_311579_694813	Fife
Hatton Burn/Keil Burn	RuralDP_BYW	227_6840_RuralDP_BYW_336101_705847	Fife
Den Burn/Lochgelly Burn	Morph_FMS	169_6311_Morph_FMS_316327_690915	Fife
Cocklemill Burn/Den Burn (Source to Saw Mill Bridge)	RuralDP_NG	219_4320_RuralDP_NG_345265_707190	Fife
Dour Burn	RuralDP_BYW	117_4313_RuralDP_BYW_320112_687857	Fife
Hatton Burn/Keil Burn	RuralDP_FMS	226_6840_RuralDP_FMS_334908_705995	Fife
Cocklemill Burn/Den Burn (Source to Saw Mill Bridge)	RuralDP_FMS	220_4320_RuralDP_FMS_345231_707187	Fife
River Tyne (Source to Birns Water confluence)	RuralDP_FMS	243_4001_RuralDP_FMS_337919_661127	Midlothian
River Tyne (Source to Birns Water confluence)	RuralDP_BYW	244_4001_RuralDP_BYW_338430_660454	Midlothian
Birns Water/Humbie Water	RuralDP_BYW	247_4008_RuralDP_BYW_346149_663804	Midlothian/Borders

Water Body	Pressure IHN	Unique ID	Local Authority
Birns Water/Humbie Water	RuralDP_FMS	246_4008_RuralDP_FMS_347118_658440	Midlothian/Borders
Bilston/Boghall Burn	RuralDP_BYW	83_3813_RuralDP_BYW_327882_664808	Midlothian
River Tyne (Source to Birns Water confluence)	RuralDP_NG	242_4001_RuralDP_NG_338074_660664	Midlothian
Bilston/Boghall Burn	RuralDP_FMS	85_3813_RuralDP_FMS_323394_665598	Midlothian
Keith Water/Fala Dam Burn	RuralDP_NG	239_4011_RuralDP_NG_341926_660188	Midlothian
River Tyne (Source to Birns Water confluence)	RuralDP_BYW	245_4001_RuralDP_BYW_338430_660454	Midlothian
Dalhousie Burn/Shiel Burn	RuralDP_FMS	81_3818_RuralDP_FMS_327357_659044	Midlothian
Keith Water/Fala Dam Burn	RuralDP_BYW	240_4011_RuralDP_BYW_343929_662456	Midlothian/Borders
Keith Water/Fala Dam Burn	RuralDP_FMS	241_4011_RuralDP_FMS_343172_661747	Midlothian/Borders
Dalhousie Burn/Shiel Burn	RuralDP_FMS	82_3818_RuralDP_FMS_327357_659044	Midlothian
Bilston/Boghall Burn	RuralDP_FMS	86_3813_RuralDP_FMS_323394_665598	Midlothian
Dalhousie Burn/Shiel Burn	RuralDP_NG	80_3818_RuralDP_NG_327260_658889	Midlothian
River Avon (Source to Jawhills)	RuralDP_BYW	264_3102_RuralDP_BYW_280583_672123	North Lanarkshire
River Avon (Source to Jawhills)	Morph_BYW	263_3102_Morph_BYW_281055_672560	North Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	Morph_FMS	251_3003_Morph_FMS_289937_663760	North Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_FMS	253_3003_UrbanDP_FMS_295292_665075	North Lanarkshire
Bonny Water/Red Burn	UrbanDP_BYW	258_4205_UrbanDP_BYW_277294_674637	North Lanarkshire
Glencryan Burn	RuralDP_BYW	259_4206_RuralDP_BYW_277691_673944	North Lanarkshire
Glencryan Burn	RuralDP_FMS	260_4206_RuralDP_FMS_279388_673733	North Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_BYW	255_3003_UrbanDP_BYW_293047_665408	North Lanarkshire
River Avon (Source to Jawhills)	Morph_BYW	265_3102_Morph_BYW_280511_671724	North Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	Morph_BYW	252_3003_Morph_BYW_287720_663070	North Lanarkshire
River Avon (Source to Jawhills)	RuralDP_FMS	267_3102_RuralDP_FMS_281440_672942	North Lanarkshire
River Avon (Source to Jawhills)	RuralDP_FMS	266_3102_RuralDP_FMS_281440_672942	North Lanarkshire
River Leven (Loch Leven to Markinch)	Morph_BYW	206_6301_Morph_BYW_317454_699452	Perth & Kinross
Loch Leven	RuralDP_FMS	215_100269_RuralDP_FMS_314676_701568	Perth & Kinross
Loch Leven	RuralDP_BYW	208_100269_RuralDP_BYW_317138_699824	Perth & Kinross
Allan Water (Source to Greenloaning)	Morph_NG	28_4601_Morph_NG_287565_709330	Perth & Kinross
Allan Water (Source to Greenloaning)	Morph_FMS	29_4601_Morph_FMS_287108_709185	Perth & Kinross
Allan Water (Source to Greenloaning)	Morph_NG	31_4601_Morph_NG_284965_708450	Perth & Kinross
Allan Water (Source to Greenloaning)	Morph_FMS	32_4601_Morph_FMS_285157_708585	Perth & Kinross
Allan Water (Greenloaning to Dunblane)	Morph_BYW	27_6833_Morph_BYW_282772_707768	Perth & Kinross

Water Body	Pressure IHN	Unique ID	Local Authority
Loch Leven	RuralDP_BYW	209_100269_RuralDP_BYW_317138_699824	Perth & Kinross
River Leven (Loch Leven to Markinch)	RuralDP_BYW	207_6301_RuralDP_BYW_317441_699440	Perth & Kinross
Allan Water (Source to Greenloaning)	Morph_FMS	30_4601_Morph_FMS_286241_708893	Perth & Kinross
Gairney Water	RuralDP_FMS	203_6315_RuralDP_FMS_314023_699489	Perth & Kinross
Loch Leven	RuralDP_FMS	214_100269_RuralDP_FMS_314676_701568	Perth & Kinross
North Queich River	Morph_FMS	201_6320_Morph_FMS_313064_703536	Perth & Kinross
Kelty Burn	Morph_BYW	189_6306_Morph_BYW_313101_695301	Perth & Kinross
North Queich River	Morph_FMS	200_6320_Morph_FMS_312819_704050	Perth & Kinross
Gairney Water	Morph_FMS	202_6315_Morph_FMS_314103_699876	Perth & Kinross
Greens Burn	RuralDP_FMS	217_6316_RuralDP_FMS_315476_703300	Perth & Kinross
Greens Burn	Morph_FMS	216_6316_Morph_FMS_315489_703371	Perth & Kinross
Tower Burn (Pease Burn)	RuralDP_BYW	72_5001_RuralDP_BYW_379369_668531	Scottish Borders
Eye Water (Source to Ale Water Confluence)	RuralDP_BYW	34_5011_RuralDP_BYW_393313_661545	Scottish Borders
Ale Water	RuralDP_BYW	41_5012_RuralDP_BYW_391906_663257	Scottish Borders
Ale Water	RuralDP_BYW	35_5012_RuralDP_BYW_391906_663257	Scottish Borders
Eye Water (Ale Water Confluence to Eyemouth)	RuralDP_BYW	33_5010_RuralDP_BYW_393957_662826	Scottish Borders
Eye Water (Source to Ale Water Confluence)	RuralDP_NG	37_5011_RuralDP_NG_385189_662508	Scottish Borders
Eye Water (Source to Ale Water Confluence)	RuralDP_NG	36_5011_RuralDP_NG_385189_662508	Scottish Borders
Ale Water	RuralDP_FMS	38_5012_RuralDP_FMS_384131_668646	Scottish Borders
Ale Water	RuralDP_FMS	39_5012_RuralDP_FMS_384131_668646	Scottish Borders
Eye Water (Source to Ale Water Confluence)	RuralDP_FMS	75_5011_RuralDP_FMS_372685_667713	Scottish Borders
Ale Water	RuralDP_NG	40_5012_RuralDP_NG_387728_664878	Scottish Borders
Cobbinshaw Reservoir	RuralDP_NG	334_100295_RuralDP_NG_301115_657000	South Lanarkshire
Loch Venachar	Morph_FMS	299_100266_Morph_FMS_257327_705723	Stirling
Allan Water (Greenloaning to Dunblane)	Morph_NG	274_6833_Morph_NG_277884_701664	Stirling
Lake of Menteith	RuralDP_BYW	288_100271_RuralDP_BYW_258483_700065	Stirling
Loch Venachar	Morph_FMS	298_100266_Morph_FMS_257327_705723	Stirling
Allan Water d/s of Dunblane	Morph_BYW	272_6832_Morph_BYW_278595_698063	Stirling
Allan Water (Greenloaning to Dunblane)	Morph_NG	273_6833_Morph_NG_277651_701906	Stirling
Loch Venachar	Morph_BYW	305_100266_Morph_BYW_255074_705646	Stirling
Lake of Menteith	RuralDP_NG	280_100271_RuralDP_NG_257308_700032	Stirling
Loch Venachar	Morph_BYW	303_100266_Morph_BYW_255074_705646	Stirling

Water Body	Pressure IHN	Unique ID	Local Authority
Lake of Menteith	RuralDP_BYW	289_100271_RuralDP_BYW_258483_700065	Stirling
Lake of Menteith	RuralDP_NG	278_100271_RuralDP_NG_257308_700032	Stirling
Lake of Menteith	RuralDP_FMS	286_100271_RuralDP_FMS_258202_700054	Stirling
Lake of Menteith	RuralDP_NG	282_100271_RuralDP_NG_257308_700032	Stirling
Lake of Menteith	RuralDP_NG	279_100271_RuralDP_NG_257308_700032	Stirling
Lake of Menteith	RuralDP_NG	281_100271_RuralDP_NG_257308_700032	Stirling
Lake of Menteith	RuralDP_FMS	285_100271_RuralDP_FMS_258202_700054	Stirling
Loch Venachar	Morph_NG	295_100266_Morph_NG_259599_706421	Stirling
Monachyle Burn	Morph_BYW	310_4721_Morph_BYW_247722_723783	Stirling
Loch Lubnaig	Morph_FMS	297_100258_Morph_FMS_256317_714922	Stirling
Loch Venachar	Morph_BYW	302_100266_Morph_BYW_255074_705646	Stirling
Loch Venachar	Morph_BYW	304_100266_Morph_BYW_255074_705646	Stirling
Loch Ard	Morph_BYW	329_100270_Morph_BYW_247624_701565	Stirling
Drunkie Burn (Loch Drunkie sluice to Loch Venachar)	Morph_BYW	300_4734_Morph_BYW_255765_704346	Stirling
Duchray Water	RuralDP_NG	312_4733_RuralDP_NG_243657_702924	Stirling
Duchray Water	RuralDP_FMS	313_4733_RuralDP_FMS_238280_705236	Stirling
Duchray Water	RuralDP_BYW	315_4733_RuralDP_BYW_243507_702939	Stirling
Lake of Menteith	RuralDP_NG	283_100271_RuralDP_NG_257308_700032	Stirling
Duchray Water	RuralDP_BYW	314_4733_RuralDP_BYW_243507_702939	Stirling
Monachyle Burn	Morph_FMS	308_4721_Morph_FMS_247773_724793	Stirling
Goodie Water	RuralDP_BYW	293_4726_RuralDP_BYW_261393_700009	Stirling
Monachyle Burn	Morph_FMS	307_4721_Morph_FMS_247773_724793	Stirling
River Forth (Arnprior Burn to Goodie Water confluences)	RuralDP_BYW	294_4702_RuralDP_BYW_263591_696768	Stirling
Loch Chon	Morph_BYW	319_100265_Morph_BYW_242058_705487	Stirling
Duchray Water	RuralDP_BYW	322_4733_RuralDP_BYW_243507_702939	Stirling
Goodie Water	RuralDP_FMS	284_4726_RuralDP_FMS_259159_699837	Stirling
Goodie Water	RuralDP_BYW	287_4726_RuralDP_BYW_261393_700009	Stirling
River Forth (Auchentroig Burn to Arnprior Burn confluences)	RuralDP_FMS	292_4703_RuralDP_FMS_258318_697020	Stirling
Loch Ard	Morph_FMS	326_100270_Morph_FMS_246097_701697	Stirling
Loch Drunkie	Morph_BYW	277_100268_Morph_BYW_254005_704611	Stirling
Goodie Water	Morph_FMS	290_4726_Morph_FMS_259362_699682	Stirling
Loch Venachar	Morph_BYW	306_100266_Morph_BYW_255074_705646	Stirling

Water Body	Pressure IHN	Unique ID	Local Authority
Loch Ard	Morph_BYW	327_100270_Morph_BYW_247624_701565	Stirling
Loch Ard	Morph_BYW	328_100270_Morph_BYW_247624_701565	Stirling
Duchray Water	RuralDP_NG	320_4733_RuralDP_NG_243657_702924	Stirling
Duchray Water	RuralDP_BYW	321_4733_RuralDP_BYW_243507_702939	Stirling
Loch Ard	Morph_NG	323_100270_Morph_NG_245171_701781	Stirling
Loch Drunkie	Morph_BYW	301_100268_Morph_BYW_254005_704611	Stirling
Monachyle Burn	Morph_FMS	309_4721_Morph_FMS_247773_724793	Stirling
Duchray Water	RuralDP_FMS	317_4733_RuralDP_FMS_238280_705236	Stirling
Loch Chon	Morph_BYW	316_100265_Morph_BYW_242058_705487	Stirling
Sauchenford Burn (Source to Plean sewage works)	Morph_NG	269_3203_Morph_NG_282078_688295	Stirling
River Forth (Arnprior Burn to Goodie Water confluences)	RuralDP_FMS	291_4702_RuralDP_FMS_263645_696807	Stirling
Loch Chon	Morph_FMS	318_100265_Morph_FMS_242303_704896	Stirling
Sauchenford Burn (Source to Plean sewage works)	Morph_NG	271_3203_Morph_NG_282611_688340	Stirling
Sauchenford Burn (Source to Plean sewage works)	Morph_NG	270_3203_Morph_NG_282503_688279	Stirling
Loch Chon	Morph_NG	311_100265_Morph_NG_241583_706505	Stirling
Loch Ard	Morph_FMS	324_100270_Morph_FMS_246097_701697	Stirling
Loch Ard	Morph_FMS	325_100270_Morph_FMS_246097_701697	Stirling
Loch Lubnaig	Morph_FMS	296_100258_Morph_FMS_256317_714922	Stirling
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	373_3014_RuralDP_FMS_306130_661017	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_BYW	390_3014_RuralDP_BYW_307683_666618	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_NG	391_3107_Morph_NG_297096_667730	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_NG	394_3107_UrbanDP_NG_296804_668468	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_NG	362_3003_UrbanDP_NG_296184_665600	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_NG	360_3003_Morph_NG_297833_665572	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_FMS	393_3107_Morph_FMS_297065_667702	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_FMS	395_3107_UrbanDP_FMS_296842_668945	West Lothian
Muireston Water	RuralDP_BYW	369_3015_RuralDP_BYW_307293_666668	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_FMS	398_3107_UrbanDP_FMS_296842_668945	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_BYW	347_3003_Morph_BYW_293277_665517	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_NG	392_3107_Morph_NG_297067_668233	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_BYW	357_3003_UrbanDP_BYW_293047_665408	West Lothian
River Avon (Source to Jawhills)	Morph_FMS	261_3102_Morph_FMS_281471_673053	W Lothian /N Lanarkshire

Water Body	Pressure IHN	Unique ID	Local Authority
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_NG	356_3003_UrbanDP_NG_296184_665600	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_FMS	397_3107_Morph_FMS_296241_670427	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_NG	370_3014_RuralDP_NG_307434_666036	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	371_3014_RuralDP_FMS_306130_661017	West Lothian
River Avon (Source to Jawhills)	RuralDP_FMS	262_3102_RuralDP_FMS_281440_672942	W Lothian /N Lanarkshire
Killandean Burn/Harwood Water	RuralDP_NG	378_3018_RuralDP_NG_302880_663592	West Lothian
Logie Water/Barbauchlaw Burn	Morph_NG	382_3106_Morph_NG_294117_672177	West Lothian
Breich Water/Darmead Linn	RuralDP_FMS	343_3021_RuralDP_FMS_296065_661268	West Lothian
Logie Water/Barbauchlaw Burn	Morph_NG	381_3106_Morph_NG_294319_671899	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_NG	385_3107_UrbanDP_NG_296804_668468	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_NG	384_3107_Morph_NG_294386_671780	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_NG	383_3107_Morph_NG_294383_671674	West Lothian
Breich Water/Darmead Linn	RuralDP_BYW	344_3021_RuralDP_BYW_296211_661456	West Lothian
How Burn	RuralDP_BYW	349_3031_RuralDP_BYW_292798_665690	W Lothian / N Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	Morph_NG	354_3003_Morph_NG_293489_665611	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_FMS	363_3003_UrbanDP_FMS_295292_665075	West Lothian
Cobbinshaw Reservoir	RuralDP_FMS	337_100295_RuralDP_FMS_301608_656924	W Lothian/ S Lanarkshire
How Burn	Morph_NG	355_3031_Morph_NG_293410_665719	West Lothian
Pardovan Burn/Haugh Burn /Riccarton Burn (Source to d/s Bridgend)	RuralDP_NG	403_3401_RuralDP_NG_303918_675742	West Lothian
Logie Water/Barbauchlaw Burn	RuralDP_NG	386_3106_RuralDP_NG_294286_671614	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_FMS	361_3003_Morph_FMS_297803_665588	West Lothian
Pardovan Burn/Haugh Burn /Riccarton Burn (Source to d/s Bridgend)	Morph_NG	401_3401_Morph_NG_303805_675690	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_BYW	350_3003_Morph_BYW_292860_665386	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_NG	396_3107_UrbanDP_NG_296804_668468	West Lothian
Pardovan Burn/Haugh Burn /Riccarton Burn (Source to d/s Bridgend)	Morph_NG	402_3401_Morph_NG_304210_675883	West Lothian
Pardovan Burn (d/s Bridgend to estuary)	RuralDP_BYW	120_3400_RuralDP_BYW_307866_679009	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	341_3014_RuralDP_FMS_306130_661017	West Lothian
Muireston Water	RuralDP_NG	367_3015_RuralDP_NG_306932_666057	West Lothian
Logie Water/Barbauchlaw Burn	Morph_NG	380_3106_Morph_NG_294383_671674	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	342_3014_RuralDP_FMS_306130_661017	West Lothian
How Burn	Morph_BYW	348_3031_Morph_BYW_293399_665646	West Lothian
Breich Water/Darmead Linn	RuralDP_FMS	364_3021_RuralDP_FMS_296065_661268	West Lothian

Water Body	Pressure IHN	Unique ID	Local Authority
River Almond (Breich Water confluence to Maitland Bridge)	UrbanDP_BYW	389_3001_UrbanDP_BYW_307168_667477	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_BYW	352_3003_UrbanDP_BYW_293047_665408	West Lothian
How Burn	RuralDP_NG	358_3031_RuralDP_NG_292309_665538	W Lothian / N Lanarkshire
River Almond (Breich Water confluence to Maitland Bridge)	UrbanDP_BYW	388_3001_UrbanDP_BYW_307168_667477	West Lothian
How Burn	Morph_NG	256_3031_Morph_NG_291660_665302	W Lothian / N Lanarkshire
Lochshot Burn	Morph_BYW	366_3020_Morph_BYW_299670_666962	West Lothian
Cobbinshaw Reservoir	RuralDP_NG	335_100295_RuralDP_NG_301115_657000	W Lothian /S Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_FMS	254_3003_UrbanDP_FMS_295292_665075	W Lothian/ N Lanarkshire
Muireston Water	RuralDP_FMS	368_3015_RuralDP_FMS_307040_666266	West Lothian
How Burn	RuralDP_NG	257_3031_RuralDP_NG_292309_665538	W Lothian / N Lanarkshire
Breich Water/Darmead Linn	RuralDP_FMS	332_3021_RuralDP_FMS_296065_661268	W Lothian / N Lanarkshire
Killandean Burn/Harwood Water	RuralDP_FMS	336_3018_RuralDP_FMS_299155_658525	W Lothian / S Lanarkshire
How Burn	Morph_BYW	345_3031_Morph_BYW_292056_665437	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_NG	351_3003_UrbanDP_NG_296184_665600	West Lothian
Water of Leith (Source to Harperrig Reservoir)	Morph_FMS	375_3704_Morph_FMS_308361_659221	West Lothian
Water of Leith (Source to Harperrig Reservoir)	Morph_FMS	376_3704_Morph_FMS_308536_659056	West Lothian
Water of Leith (Source to Harperrig Reservoir)	Morph_FMS	377_3704_Morph_FMS_308116_657743	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	374_3014_RuralDP_FMS_306130_661017	West Lothian
Logie Water/Barbauchlaw Burn	RuralDP_NG	387_3106_RuralDP_NG_294286_671614	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	372_3014_RuralDP_FMS_306130_661017	West Lothian
Pardovan Burn (d/s Bridgend to estuary)	RuralDP_NG	404_3400_RuralDP_NG_306371_678028	West Lothian
Niddry Burn	RuralDP_BYW	400_3007_RuralDP_BYW_302584_673082	West Lothian
Pardovan Burn (d/s Bridgend to estuary)	RuralDP_NG	110_3400_RuralDP_NG_306371_678028	West Lothian
Logie Water/Barbauchlaw Burn	RuralDP_FMS	250_3106_RuralDP_FMS_288811_666601	West Lothian
Killandean Burn/Harwood Water	RuralDP_FMS	333_3018_RuralDP_FMS_299155_658525	West Lothian
Breich Water/Darmead Linn	RuralDP_BYW	330_3021_RuralDP_BYW_296211_661456	West Lothian
Breich Water/Darmead Linn	RuralDP_BYW	331_3021_RuralDP_BYW_296211_661456	West Lothian
Logie Water/Barbauchlaw Burn	Morph_FMS	249_3106_Morph_FMS_287848_666039	West Lothian
How Burn	RuralDP_FMS	353_3031_RuralDP_FMS_293079_665851	W Lothian / N Lanarkshire
Logie Water/Barbauchlaw Burn	RuralDP_FMS	379_3106_RuralDP_FMS_288811_666601	West Lothian
Foulshiels Burn/Bickerton Burn	RuralDP_FMS	346_3027_RuralDP_FMS_294142_663064	West Lothian
Breich Water/Darmead Linn	RuralDP_FMS	365_3021_RuralDP_FMS_296065_661268	West Lothian

Water Body	Pressure IHN	Unique ID	Local Authority
Killandean Burn/Harwood Water	RuralDP_FMS	338_3018_RuralDP_FMS_299155_658525	West Lothian
Killandean Burn/Harwood Water	RuralDP_FMS	339_3018_RuralDP_FMS_299155_658525	West Lothian
Killandean Burn/Harwood Water	RuralDP_BYW	340_3018_RuralDP_BYW_301296_660808	West Lothian
Mains Burn	Morph_FMS	104_3103_Morph_FMS_298817_674862	West Lothian
Mains Burn	Morph_FMS	105_3103_Morph_FMS_299171_674893	West Lothian
Foulshiels Burn/Bickerton Burn	RuralDP_FMS	359_3027_RuralDP_FMS_294142_663064	West Lothian
Niddry Burn	RuralDP_BYW	399_3007_RuralDP_BYW_302584_673082	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	373_3014_RuralDP_FMS_306130_661017	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_BYW	390_3014_RuralDP_BYW_307683_666618	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_NG	391_3107_Morph_NG_297096_667730	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_NG	394_3107_UrbanDP_NG_296804_668468	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_NG	362_3003_UrbanDP_NG_296184_665600	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_NG	360_3003_Morph_NG_297833_665572	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_FMS	393_3107_Morph_FMS_297065_667702	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_FMS	395_3107_UrbanDP_FMS_296842_668945	West Lothian
Muireston Water	RuralDP_BYW	369_3015_RuralDP_BYW_307293_666668	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_FMS	398_3107_UrbanDP_FMS_296842_668945	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_BYW	347_3003_Morph_BYW_293277_665517	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_NG	392_3107_Morph_NG_297067_668233	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_BYW	357_3003_UrbanDP_BYW_293047_665408	West Lothian
River Avon (Source to Jawhills)	Morph_FMS	261_3102_Morph_FMS_281471_673053	W Lothian /N Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_NG	356_3003_UrbanDP_NG_296184_665600	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_FMS	397_3107_Morph_FMS_296241_670427	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_NG	370_3014_RuralDP_NG_307434_666036	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	371_3014_RuralDP_FMS_306130_661017	West Lothian
River Avon (Source to Jawhills)	RuralDP_FMS	262_3102_RuralDP_FMS_281440_672942	W Lothian /N Lanarkshire
Killandean Burn/Harwood Water	RuralDP_NG	378_3018_RuralDP_NG_302880_663592	West Lothian
Logie Water/Barbauchlaw Burn	Morph_NG	382_3106_Morph_NG_294117_672177	West Lothian
Breich Water/Darmead Linn	RuralDP_FMS	343_3021_RuralDP_FMS_296065_661268	West Lothian
Logie Water/Barbauchlaw Burn	Morph_NG	381_3106_Morph_NG_294319_671899	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_NG	385_3107_UrbanDP_NG_296804_668468	West Lothian
Boghead Burn/Bog Burn/Couston Water	Morph_NG	384_3107_Morph_NG_294386_671780	West Lothian

Water Body	Pressure IHN	Unique ID	Local Authority
Boghead Burn/Bog Burn/Couston Water	Morph_NG	383_3107_Morph_NG_294383_671674	West Lothian
Breich Water/Darmead Linn	RuralDP_BYW	344_3021_RuralDP_BYW_296211_661456	West Lothian
How Burn	RuralDP_BYW	349_3031_RuralDP_BYW_292798_665690	W Lothian /N Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	Morph_NG	354_3003_Morph_NG_293489_665611	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_FMS	363_3003_UrbanDP_FMS_295292_665075	West Lothian
Cobbinshaw Reservoir	RuralDP_FMS	337_100295_RuralDP_FMS_301608_656924	W Lothian/S Lanarkshire
How Burn	Morph_NG	355_3031_Morph_NG_293410_665719	West Lothian
Pardovan Burn/Haugh Burn /Riccarton Burn (Source to d/s Bridgend)	RuralDP_NG	403_3401_RuralDP_NG_303918_675742	West Lothian
Logie Water/Barbauchlaw Burn	RuralDP_NG	386_3106_RuralDP_NG_294286_671614	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_FMS	361_3003_Morph_FMS_297803_665588	West Lothian
Pardovan Burn/Haugh Burn /Riccarton Burn (Source to d/s Bridgend)	Morph_NG	401_3401_Morph_NG_303805_675690	West Lothian
River Almond (Source to Foulshiels Burn confluence)	Morph_BYW	350_3003_Morph_BYW_292860_665386	West Lothian
Boghead Burn/Bog Burn/Couston Water	UrbanDP_NG	396_3107_UrbanDP_NG_296804_668468	West Lothian
Pardovan Burn/Haugh Burn /Riccarton Burn (Source to d/s Bridgend)	Morph_NG	402_3401_Morph_NG_304210_675883	West Lothian
Pardovan Burn (d/s Bridgend to estuary)	RuralDP_BYW	120_3400_RuralDP_BYW_307866_679009	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	341_3014_RuralDP_FMS_306130_661017	West Lothian
Muireston Water	RuralDP_NG	367_3015_RuralDP_NG_306932_666057	West Lothian
Logie Water/Barbauchlaw Burn	Morph_NG	380_3106_Morph_NG_294383_671674	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	342_3014_RuralDP_FMS_306130_661017	West Lothian
How Burn	Morph_BYW	348_3031_Morph_BYW_293399_665646	West Lothian
Breich Water/Darmead Linn	RuralDP_FMS	364_3021_RuralDP_FMS_296065_661268	West Lothian
River Almond (Breich Water confluence to Maitland Bridge)	UrbanDP_BYW	389_3001_UrbanDP_BYW_307168_667477	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_BYW	352_3003_UrbanDP_BYW_293047_665408	West Lothian
How Burn	RuralDP_NG	358_3031_RuralDP_NG_292309_665538	W Lothian / N Lanarkshire
River Almond (Breich Water confluence to Maitland Bridge)	UrbanDP_BYW	388_3001_UrbanDP_BYW_307168_667477	West Lothian
How Burn	Morph_NG	256_3031_Morph_NG_291660_665302	W Lothian / N Lanarkshire
Lochshot Burn	Morph_BYW	366_3020_Morph_BYW_299670_666962	West Lothian
Cobbinshaw Reservoir	RuralDP_NG	335_100295_RuralDP_NG_301115_657000	WLothian /S Lanarkshire
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_FMS	254_3003_UrbanDP_FMS_295292_665075	W Lothian / N Lanarkshire
Muireston Water	RuralDP_FMS	368_3015_RuralDP_FMS_307040_666266	West Lothian
How Burn	RuralDP_NG	257_3031_RuralDP_NG_292309_665538	W Lothian / N Lanarkshire
Breich Water/Darmead Linn	RuralDP_FMS	332_3021_RuralDP_FMS_296065_661268	W Lothian / N Lanarkshire

Water Body	Pressure IHN	Unique ID	Local Authority
Killandean Burn/Harwood Water	RuralDP_FMS	336_3018_RuralDP_FMS_299155_658525	W Lothian /S Lanarkshire
How Burn	Morph_BYW	345_3031_Morph_BYW_292056_665437	West Lothian
River Almond (Source to Foulshiels Burn confluence)	UrbanDP_NG	351_3003_UrbanDP_NG_296184_665600	West Lothian
Water of Leith (Source to Harperrig Reservoir)	Morph_FMS	375_3704_Morph_FMS_308361_659221	West Lothian
Water of Leith (Source to Harperrig Reservoir)	Morph_FMS	376_3704_Morph_FMS_308536_659056	West Lothian
Water of Leith (Source to Harperrig Reservoir)	Morph_FMS	377_3704_Morph_FMS_308116_657743	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	374_3014_RuralDP_FMS_306130_661017	West Lothian
Logie Water/Barbauchlaw Burn	RuralDP_NG	387_3106_RuralDP_NG_294286_671614	West Lothian
Linhouse water/Camilty Burn/ Green Burn	RuralDP_FMS	372_3014_RuralDP_FMS_306130_661017	West Lothian
Pardovan Burn (d/s Bridgend to estuary)	RuralDP_NG	404_3400_RuralDP_NG_306371_678028	West Lothian
Niddry Burn	RuralDP_BYW	400_3007_RuralDP_BYW_302584_673082	West Lothian
Pardovan Burn (d/s Bridgend to estuary)	RuralDP_NG	110_3400_RuralDP_NG_306371_678028	West Lothian
Logie Water/Barbauchlaw Burn	RuralDP_FMS	250_3106_RuralDP_FMS_288811_666601	West Lothian
Killandean Burn/Harwood Water	RuralDP_FMS	333_3018_RuralDP_FMS_299155_658525	West Lothian
Breich Water/Darmead Linn	RuralDP_BYW	330_3021_RuralDP_BYW_296211_661456	West Lothian
Breich Water/Darmead Linn	RuralDP_BYW	331_3021_RuralDP_BYW_296211_661456	West Lothian
Logie Water/Barbauchlaw Burn	Morph_FMS	249_3106_Morph_FMS_287848_666039	West Lothian
How Burn	RuralDP_FMS	353_3031_RuralDP_FMS_293079_665851	W Lothian/ N Lanarkshire
Logie Water/Barbauchlaw Burn	RuralDP_FMS	379_3106_RuralDP_FMS_288811_666601	West Lothian
Foulshiels Burn/Bickerton Burn	RuralDP_FMS	346_3027_RuralDP_FMS_294142_663064	West Lothian
Breich Water/Darmead Linn	RuralDP_FMS	365_3021_RuralDP_FMS_296065_661268	West Lothian
Killandean Burn/Harwood Water	RuralDP_FMS	338_3018_RuralDP_FMS_299155_658525	West Lothian
Killandean Burn/Harwood Water	RuralDP_FMS	339_3018_RuralDP_FMS_299155_658525	West Lothian
Killandean Burn/Harwood Water	RuralDP_BYW	340_3018_RuralDP_BYW_301296_660808	West Lothian
Mains Burn	Morph_FMS	104_3103_Morph_FMS_298817_674862	West Lothian
Mains Burn	Morph_FMS	105_3103_Morph_FMS_299171_674893	West Lothian
Foulshiels Burn/Bickerton Burn	RuralDP_FMS	359_3027_RuralDP_FMS_294142_663064	West Lothian
Niddry Burn	RuralDP_BYW	399_3007_RuralDP_BYW_302584_673082	West Lothian

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C Methodology of High Level Hydromorphic Audit using Aerial Photography

This section outlines the methodology employed to conduct a high level hydromorphic audit for the Forth Basin multiple benefits study. Aerial imagery from Google Earth was interrogated to identify the following key hydromorphic features present across ecologically important sites suffering one or more environmental pressure linked to the Water Framework Directive classification. This was conducted at three scales; regional setting, channel type and morphologic / hydraulic unit.

3.4.1 Regional setting

The following regional settings were classified:

- Urban
- Upland
- Piedmont
- Confined valley
- Lowland

3.4.2 Channel Type

The following channel types were classified:

- Bedrock channel
- Pool-rapid
- Pool-riffle
- Plane bed
- Sinuous single thread
- Anastomosed

3.4.3 Morphologic / hydraulic unit

The following morphologic / hydraulic units and processes were classified:

- General activity (active or inactive system)
- Evidence of local lateral activity (scaled 1-5, localised & low-frequent & extreme)
- Evidence of in-channel bar activity (scaled 1-5, localised & low-frequent & extreme)
- Quality of floodplain geomorphology (scaled 1-5, poor-excellent)
- Quality of in-channel geomorphology (scaled 1-5, poor-excellent)
- Floodplain connectivity (scaled 1-5, disconnected-natural unhindered connection, 0=no floodplain)
- Floodplain vegetation quality (scaled 1-5, poor & monotonous-excellent & varied)
- Floodplain vegetation connectivity (scaled 1-5, isolated small patches-varied contiguous vegetation)
- Local riparian vegetation improvement (present or absent)
- Presence of hard engineering (present or absent)

3.4.4 Overall ranking

The scores were split into floodplain and in-channel factors and an average combined score was computed for the following key factors

- Floodplain- floodplain geomorphology, floodplain vegetation quality, floodplain vegetation connectivity
- In-channel- channel geomorphology, current channel morphologic activity

All of the rivers were then ranked based on the combined average score and those scoring above 3.25 were suggested as excellent candidates for successful process based channel and floodplain restoration. A cross check was also made with a qualitative assessment made during the aerial photograph analysis based on an overall impression of each channel system. Agreement occurred on many occasions suggesting that the ranking criteria adequately reflect the overall quality of the watercourses.

D GIS Methodology

D.1 Generate combined water bodies polygon file

Buffer the "SV_WB River" by 100m

Buffer the "SV_WB Lake" by 100m

Clip "River_100m_Buffer" using "SV_WB Lake"

Clip "Lake_100m_buffer" using "River_100m_Buffer"

Merge "River_100m_Buffer_nol_lake_overlap" with "Lake_100m_buffer_no_river_overlap"

D.2 Join pressure spreadsheets to GIS water bodies

Add the three pressure spreadsheets to the GIS

Join using attributes from a table the "combined water bodies" file, generated in D1 above, using the WC_ID field or equivalent found in each file.

The option to keep only matching records (outer join) should be used so that only water bodies which have a pressure are preserved.

Save the three resulting files separately so there are representation of water bodies failing for Morphological pressures, Urban Diffuse Pollution Pressures and Rural Diffuse Pollution Pressures.

D.3 Select IHN and water body overlap areas.

Add the three different IHN extents into the GIS, the variable 2km buffer should be used rather than the core habitats.

Clip each of the WFD Pressure extents to each of the habitat network types eg

Clip "Morph_Combined_WC" by "BYW" to give Morph_BYW as per the table below:

	Morphological Pressure (Morph)	Urban Diffuse Pollution Pressure (UrbanDP)	Rural Diffuse Pollution Pressure (RuralDP)
Broadleaved & Yew Woodland (BYW)	Morph_BYW	UrbanDP_BYW	RuralDP_BYW
Fen, Marsh & Swamp (FMS)	Morph_FMS	UrbanDP_FMS	RuralDP_FMS
Neutral Grassland (NG)	Morph_NG	UrbanDP_NG	RuralDP_NG

This will give nine GIS result files.

D.4 Buffer Morphology Features

Merge individual morphology pressure features into a single layer then buffer by 25m

Using this buffered layer Clip " Morph_BYW", " Morph_FMS" and " Morph_NG" and discard parts of these polygons falling outside of the 25m buffered area.

D.5 Merge result files

Add an extra field to each result file called "Pres_IHN" and in the attribute table use the "Field Calculator" to populate the field with the name of the file from the table above.

Merge the 9 files together to produce 1 single file named "Merged_OA_Output"

D.6 Remove areas less than 500m^2

Add a new field called "Area" (Double 0 precision) and populate using "Calculate Geometry - Area"

Select features with Area <500m^2 and delete

D.7 Generate unique ID

Add X and Y values for each feature

Add a new field called JBA_ID (String, 256 Character)

In "Field Calculator" populate the field with the following statement:

[FID]&"_"& [WATER_BODY]&"_"& [Press_IHN]&"_"& [X]&"_"& [Y]

D.8 Initial Screening

Add the following fields:

Dev_Area (Short Int, 4)

CP (Short Int, 4)

CP_250 (Short Int, 4)

VDL (Short Int, 4)

LNR (Short Int, 4)

NNR (Short Int, 4)

Populate these fields using the appropriate data representing: Future development areas, Core paths, 250m buffer round core paths, areas of vacant an derelict land, combined local nature areas (LNR's, SWT reserves, etc) and combined national nature areas (NNR, SSSI's etc)

Using "Select by Location" select the features within "Merged_OA_Output" which intersect each of the screening layers in turn, populate the fields with a "1" where the files intersect and a "0" if there is no intersection.

D.9 Multi-Criteria Analysis - GIS Derived Screening Parameters

In these spatial analyses unless specified the field type will be Short Int, 4 and the data should either be a 1/0 for present/not present.

D.10 Flood risk:

Fluvial - Add fields F_200_Whole and F_200_part. Select by location the features which fall entirely within and ones which only intersect the 200 year Fluvial outline.

Tidal - Add Field T_200 and Select features that intersect the 200 year tidal (coastal) outline.

Groundwater Add GW Field and Select features which intersect the GW Flood map

Catchment stage

Previous Flood event - Select features that intersect with SEPA's record of existing flooding

FPS in Catchmnent- Count number of FPS in catchment dataset, then join to pressure/habitat feature

Properties at risk downstream - Generate catchment areas downstream of feature in Archydro then Count property points within polygons.

D.11 Socio -Economic:

Area Intersected by Core Path) - Using the merged Core Path dataset and the "Merged_OA_Output". Select features that intersect the merged core path dataset.

Core Path within 250 m of Area - Using the merged Core Path dataset and the "Merged_OA_Output". Select features, which intersect with a 250m buffer around the merged core path dataset.

Derelict Vacant Land Within Area - Using the Scottish Government's "Vacant and Derelict Land" spreadsheet, plot the locations in GIS then generate polygons based upon the "Area" field (Buffer according to: radius = sqrt(area / PI)) Select features from "Merged_OA_Output" which intersect the buffered points.

Planned Developments Within Area- Merge all the individual local plan region which represent planned developments. The Select features from "Merged_OA_Output" which intersect the merged dataset.

Ancient Monument Within Area - Using Historic Scotland's Scheduled Ancient Monuments (SAM) dataset, Select features from "Merged_OA_Output" which intersect a SAM.

World Heritage Site Within Area - Using Historic Scotland's World Heritage Site (WHS) dataset, Select features from "Merged_OA_Output" which intersect a WHS.

Length of Reach of Watercourse Within Area (m) - Clip the "SV_WB" River digital river network using the "Merged_OA_Output", then calculate the length of the resulting watercourse sections that remain. Join this value to the "Merged_OA_Output" using the unique ID field.

Distance to An Area Which is in the 15%-ile of SIMD data (m) - Join "oa01" Census region dataset to "Datazone" look up table (also within Census geodatabase). Add and Join "SIMD Datazone Lookup V3 - 3-11-10" using Datazone. Rank by "OVERALL__SIMD_RANK_2009" and export the top 976 (15%) records. Add as new layer and clip to Forth_AAG outline. Generate centroids for each of the remaining polygons and use the "Distance between points(between layers)" tool in "Hawths tools" to calculate the the proximity of the closest centroid to each "Merged_OA_Output" area.

Distance To Population Centre of 1K (m) - Clip the open data dataset "m2_dlua_region" using the Forth_AAG extent. Extract popuation data from: http://www.scrol.gov.uk/scrol/common/home.jsp

for all settlements within Clackmannanshire, East Lothian, Edinburgh City, Midlothian, West Lothian, North Lanarkshire, South Lanarkshire, Perth and Kinross, Falkirk, Fife and Stirling. Join the population data to the geographical data and filter by settlements with more than 1000 inhabitants. Discard any with less than 1000. Generate centroids for each of the remaining polygons and use the "Distance between points(between layers)" tool in "Hawths tools" to calculate the the proximity of the closest centroid to each "Merged_OA_Output" area.

Area Intersects With Local Nature Reserve (Y/N)-Does the area intersect with LNR data?-Y

Area Intersects With National Nature Reserve (Y/N)-Does the area intersect with NNR data?-Y

Invasive Species Recorded Within Area (Y/N)-Have invasive species been recorded within the area?-Y

IHN Parent Patchiness-Patchiness of core IHN dataset-Y

D.12 WFD Pressures

Point Source Pollution Dataset Point Within Area - Using point source pollution locations Select features from "Merged_OA_Output" which contain a PSP location.

No. of Adjacent Pressure Overlaps (Count) - Export all the polygons from the original layer (A)to a new layer (B). Merge these into one polygon using the Editor toolbar. Run an intersect on the original file (A) and the merged layer (B). This will produce layer (C). Using Hawth's Tools, go to Vector Editing Tools, and navigate to Generate Polygon Centroid Points. Generate the Centroid Points into layer (D). Make sure you click the button to use Label points, which are inside the polygon. Again, Using Hawth's Tools, go to Analysis Tools and select Count Points in Polygons. Use layer (C) for your polygon layer, and file (D)for your point layer

D.13 General Opportunities

No. of Opportunity Areas Per Water body (Count)-A count of the number of opportunity areas that occur on particular water body- In excel group records by water body name and sum the groups.

Area of Opportunity Area (m2)- Calculate Geometry of the "Merged_OA_Output"

E Workshop

E.1 Workshop comments on areas selected during phase 1

ET_ID	Water Body	Notes
CE0	Tiel Burn	Tiel Burn is in a culvert through urban area. Morrisons have obtained planning consent to develop near it.
CE1	Dour Burn	Local ranger not aware of the condition of Dour Burn - could carry out site visit: local community keen on environment
CE2	Tiel Burn	Work could be undertaken at mouth of Tiel. This would have multiple benefits. Some already taken place through volunteers i.e.. dredging
CE3	Tiel Burn	American Signal Crayfish were seen in a burn somewhere near here
CE4	Loch Gelly	Loch Gelly could undertake major restoration work here. There is sewage pollution. Good bird population and reed bed to the West
CE5	Lochgelly Burn	Dalbeath Marsh; Priority site for restoration work - water level control. Also an opportunity to work with local community
CE6	Small unnamed watercourse	Opportunities of canalisation near Calais Muir Wood
CE7	Calais Muir Wood	Blue Waters Opportunities around Calais Muir Wood
CE8	Lyne Burn	Opportunities to work with local high schools on river improvements & education
CE9	Loch Fitty	Will be drained-mitigation opportunities. Significant opportunities with Scottish Coal extraction.
CE10	River Ore	WIAT - woods in and around town.
CE11	None	Lochgelly Strategic Development Area.
CE12	River Ore	In need of restoration i.e. silt removal, gabion basket, cleaning drains. This will effect Loch Ore quality and wet woodland.
CE13	Loch Ore	Loch Ore Meadows Nature Reserve receives 500,000 visitors per year. Restoration needed (See CE12).
CE14	River Ore	Flooding Issues
CE15	Lochty Burn	One of the biggest man made lakes in western Europe prime opportunity for restoration.
CE16	River Leven	Levenmouth Strategic Development Area.
CE17	River Leven	TAPIL - take a pride in Levenmouth partnership between Fife Council and local Community groups. Plan to undertake environmental improvement along River Leven- Particularly at the mouth from river banks to mink control. Fife Canal Contact Laura Dackean
CE18	Cocklemill Burn	INNS (giant hogweed & Himalayan Balson) and agricultural runoff. SEPA rejected initial applications for restoration funds as the scheme was not large scale enough.
CE19	Dreel Burn	INNS (giant hogweed & Himalayan Balson) and agricultural runoff. SEPA rejected initial applications for restoration funds as the scheme was not large scale enough.
CWF0	Bluther Burn	A priority for FCCT(W. Fife) due to valuable culture and natural heritage at mouth in particular (canal, weir & pond).
CWF1	Town Loch	Very public area with much use-between Townhill Country Park and Pittencrieff Park work could be undertaken here.(FCCT)
CWF2	Tower Burn	Dunfermline West Strategic Development Area.
CWF3	Lyne Burn	Fife's Wildlife Crime officer (Ian Laing) is in the process of collating database of ownership of Fife's watercourses & lochs which will help tackle poaching problems -could help identify opportunity areas for restoration work.
CWF4	Black Devon	Forest Mill- Major Housing development. Opportunities for green infrastructure improvement.
CWF5	River Devon	Flooding issues. Ochils Landscapes Partnership Projects (HLF funding) -

ET_ID	Water Body	Notes
		riverbank stabilisation etc
CWF6	Gartmorn Dam	Gartmorn Dam - Ranger involvement, Gartmorn Green Hub Report (2010) Mouchel. Hydrology, lakes & burns etc
CWF7	River Forth	Inner Forth Futurescape (12 Sites RSPB led)
CWF8	Peppermill Dam & Moor Loch	Important local sites for a restoration - priority
CWF9	River Forth and Black Devon	Black Devon Wetlands. Regulated tidal exchange. Close to Alloa. Clacks Council/ RSPB
CWF10	River Forth	Potential intertidal work and managed realignment.
CWF11	Chapel Burn	Flooding Issues
CWF12	Grange Burn	Priority - Grange Burn. Flooding and social emphasis.
EL0	Linn Dean Water	Quick Win opportunity. Area of major wind development, good potential for engagement with land owners and funding from others.
EL1	Gifford Water	Good potential for local access improvements and links to uplands
EL2	Harestanes Burn	Potential for natural green networks connection and pedestrian link to Aberlady
E0	Scour	Key Woodland/ Green Network Link
E1	North Esk	Pollution Issue. Elgin Hough. Issue on North Esk. Coal Authority trying to find land.
E2	River Esk	Key Green network opportunity.
E3	North Esk	Esk Valley Partnership Major. Project underway with landowners (as far as Mavisbark)
E4	North Esk	Restructuring conversion conifers. North Esk Project. Landscape Project. Esk Valley Partnership.
E5	North Esk	Key Green Network opportunity to connect Penicuik/ Pentlands.
E6	Swanston Burn	Pentland Project. Partial Restoration underway around new hospital(Niddrie Burn Section)- good potential for hospital and access connecting along catchment.
E7	Braid Burn	Hermitage of Braid. Under Braid Burn FPJ high velocity modelled through the woodland. CBA showed little could be done. Would be good place although is pretty natural habitat already.
E8	Harperrig Reservoir	Big opportunity to improve landscape character & recreation amenities
E9	Gogar Burn	Possible strategic green network link: landscape improvement, recreation.
E10	River Almond	Scope for access improvements. Pollution bigger problem, invasive species, flooding, habitat creation. Upstream of Almond to Canal - Gogar Burn significant opportunities/ issues. Hogweed eradication, deculverting/realignment, diffuse pollution, flooding.
E11	Water of Leith	Potential ecological impact of flood prevention works. Potential development of micro hydro generation projects (would offer opportunity for fish ladders.
E12	River Leven	Straightened
E13	Loch Leven	Lots of work has gone on here to improve water quality. Investment is not likely to yield significant results when to be self cleaned
E14	Loch Leven	Lots of work has gone on here to improve water quality. Investment is not likely to yield significant results when to be self cleaned
E15	Loch Leven	Lomond Hills Landscaping Project. HLF funding for development phase will look at feasibility of river/loch restoration in this area
E16	Conland Burn	
E17	Conland Burn	Back Burn also runs into Coul Den NNR - Conservation work taking place here
E18	River Leven	TAPIG- Take a pride in Glenrothes Fife Council/community group partnership for the Glenrothes area. Have funded pond (Stenton & riverside) and river (mink controls) projects. Looking to discover more

ET_ID	Water Body	Notes
		biodiversity projects multiple benefit opportunity
E19	Freuchie Burn	Flooding
E20	River Eden	Kettle Produce. lots of irrigation and straightened burns
E21	Lochty Burn	Straightened, lots of informed recreation
E22	Lochty Burn	Core Path Plan. Informal Access important
NLF0	Garbethill Burn	Sewage Cake. My worry is 1000's of tons of sewage cake is being dug into the ground on a very large scale. What will be the environmental impact in the years to come?
NLF1	Field Drain	Sewage Cake
NLF2	River Avon	Sprawling burn
NLF3	Culloch Burn	Salmon have been filmed here
NLF4	River Avon	SEPA Phase 4 in progress
NLF5	River Avon	SAPA Phase 3
NLF6	Bonny Water	Identified stretches of the Bonny Water seem to be disjointed. Why not have one Priority Project along its length with the identified stretches as key pieces for ecological work.
NLF7	Forth and Clyde Canal	Wildlife Site
NLF8	Falkirk Wheel	Wheel
NLF9	Forth and Clyde Canal	Dev Site
NLF10	Bonny Water	Local Nature Reserve
NLF11	Bonny Water	Focus on aspects like access paths, invasives control flooding etc. Issues with sewar overflows due to Pressure from new Housing.
NLF12	River Carron	LADE SSSI
NLF13	How Burn	Underground culvert
NLF14	River Carron	CSFT Project
NLF15	Little Denny Burn	Deut Site
NLF16	River Carron	River Carron & Tributaries (incl. Bonny Water) - Project started to map and control invasive species. INNS data available
NLF17	River Carron	Active community involvement in River Carron & Tributaries - Communities along the Carron Group
NLF18	Bonny Water	Bonny Marsh issue for R.C.F.M.G (especially Cumbernauld S.W.T Works)
NLF19	Red Burn	SW. Started work on SUDS ponds Urban D.P
NLF20	Castleranking Burn	RCFMG Priority
NLF21	None	Falkirk Locally Designed Sites dataset available from Falkirk Council - Wildlife sites, LNK
NLF22	Forth and Clyde Canal	Potential to improve connectivity of watercourses / canals etc.
WL0	Linhouse Water	Linhouse Water. Flood Risk at Mid Calder
WL1	Dedridge Burn	Dedridge Burn. Morphological, urban runoff, acid drainage, flood risk, pollution.
WL2	River Almond	INNS - Major problem on the River Almond. Plan / Studies/ Action.
WL3	Brox Burn	Brox Burn - Flood risk, diffuse pollution, INNS.
WL4	Lochshot Burn	Habitat network opportunities missed because of non-baseline.
WL5	None	Sepa commented on master plan - Development site, habitat issue. Significant work site opportunities.
WL6	Brox Burn	Future Development site. Urban P.P. Pressures & culverting from Deans on Dechmont Burn at Dechmont.
WL7	Niddry Burn	FRC - Habitat enhancement opportunities.
WL8	Midhope Burn	Hopetoun Estate has a 5 year forest management plan.

ET_ID	Water Body	Notes
WL9	Linlithgow Loch	Linlithgow Loch. Nutrient & Morphological. Culvert CEH study. Flood Risk.
WL10	River Almond	New M8 junction - see what is included as conditions on licence.
WL11	River Almond	River diversion planned. Check SEPA. Recent plans check CSFT.
WL12	Logie Water	Salmon in lower Logie water obstructed by large weir at confluence with Couston water (RFFT).
WL13	Couston Water	Future development site, but as far as aware no developer conditions to address pressure - important to check.
WL14	Couston Water	Lots of canal owned land in this area so restoration could be feasible.
WL15	Couston Water	Couston water quality very poor indeed due to sewage. Fish community non-existent despite good habitat (RFFT).
WL16	Couston Water	Under development already - potentially missed opportunity.
WL17	Couston Water	Flood alleviation scheme on this site. Bathgate Water/ Bog Burn. Sedimentation. Urban diffuse, pollution.
WL18	Darmead Linn	Query Road Culvert?
WL19	River Avon	Heavy siltation problem . Channel has been deepened and straightened, salmon are trying to recover here. Problem extends for miles upstream. New education project for Slamannan starting 2012 with RFFT.
WL20	Avon Water	Slamannan River restoration project (2008-present). What will be environmental impact in years to come.
WL21	River Avon	INNS mapping being done for Avon and tributaries. Data available from RAFTS

E.2 Areas highlighted by responses to the questionnaires

ET_ID	Water Body	Notes
IQ1	River Avon	River Avon upstream of Slamannan proposed Phase 4 of project will improve habitat in stream open up spawning to migratory fish. Obtain funding to fence off river bank which would benefit all wildlife.
IQ2	River Avon	For 5 years we have been working on habitat improvement. We have almost finished
IQ3	River Avon	The upper River Avon (From Avon bridge , upstream) suffers from morphological impacts û the channel has been straightened and deepened and has a severe siltation problem from surrounding farmland.
IQ4	River Avon	As a result the salmon and trout communities are really struggling which is a shame because the Avon could be a lovely salmon river. The local communities are not well off and the area is quite run down.
IQ5	River Avon	An upper Avon Project would involve: Wetland creation to intercept sediments and runoff contaminated by heavy mental; Riparian Planting and fencing to reduce sedimentation from arable fields and cattle drinkers;
IQ6	River Avon	Fish go to school project for local primary schools to disseminate conservation benefits of the project as well as an interest in protecting our environment. Dissemination & sign of local land owners to rural stewardship schemes.
IQ7	River South Esk	Restoration of the water environment could result in multiple benefits at the South Esk on pointing flowing past Newbattle.
IQ8	River North Esk	Restoration of the water environment could result in multiple benefits at the North Esk - Elginhaugh
IQ9	Lyne Burn	FIG21 ET-ID:86 BYW Morph pressure, Lyne Burn û looks like u/s of Halbeath, which is called Mowbray burn I think. Aware of some issues re. flow reduction there. Wonder what is proposed?
IQ10	Brankholm Burn	Morph pressure, Brankholm burn û looks like area at back of Camdean school. CSO discharge there has been problematic for sewage pollution at times. A straightened channel with large green space around it before it enters culvert û potential for

ET_ID	Water Body	Notes
IQ11	Loch Leven	FIG99 ET-ID:209FMS-rural diffuse pollution, Loch Leven. FIG99 ET-ID:194FMS-rural diffuse pollution, Loch Leven. FIG99 ET-ID:139BYW-rural diffuse pollution, Loch Leven.
IQ12	Loch Leven	Any work around loch leven to address DP would be good. On-going eutrophication concerns from nutrient enrichment.
IQ13	Linlithgow Loch	Falkirk Invasive Species Forum -FISF- aim to tackle the growing problem of riparian INNS across the Falkirk area, particularly (but not exclusively) Japanese Knotweed.
IQ14	Linlithgow Loch	The area covered by the forum encompasses several major landowners, some of whom are represented on the forum, along with fishing interests and community groups who are the volunteer force and who initially mapped the Carron and Avon catchments.
IQ15	Linthlithgow Loch	I am part of a stakeholder group - Linlithgow Loch Catchment management group which is looking at the multiple impacts on the loch (urban and rural nutrient inputs, fish stocking, flooding issues,
IQ16	Linlithgow Loch	Restoration would increase the biodiversity in line with the SSSI designation and improve water quality in the loch and on the Mains Burn and River Avon which are downstream There is a consultant
IQ17	River Almond	Restoration of the water environment could result in multiple benefits at the River Almond, Edinburgh.
IQ18	River Esk	Restoration of the water environment could result in multiple benefits at the River Esk, Midlothian

E.3 Workshop Figures

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INNS (giant hogweed & Himalayan Balson) and agricultural runoff. SEPA rejected initial applications for restoration funds as the scheme was not large scale enough.

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Potential for natural green networks connection and pedestrian link to Aberlady

Key Green network opportunity.

Pollution Issue. Elgin Hough. Issue on North Esk. Coal Authority trying to find land.

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Major.
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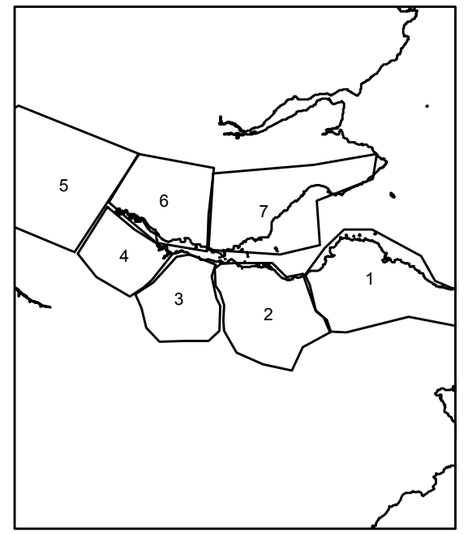
Quick Win opportunity. Area of major wind development, good potential for engagement with land owners and funding from others.

Good potential for local access improvements and links to uplands

Raster250k

0 1.753.5 7 10.5 14 17.5
Kilometers

KEYPLAN



LEGEND

- Workshop Breakout Group Notes
- Merged Workshop Notes

JBA consulting

Figure: E-1

Sites highlighted during workshop in East Lothian

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Dechmont.

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Habitat network opportunities missed because of non-baseline.

FRC - Habitat enhancement opportunities.

Possible strategic green network link: landscape improvement, recreation.

Hopetoun Estate has a 5 year forest management plan.

Hermitage of Braid. Under Braid Burn FPJ high velocity modelled through the woodland. CBA showed little could be done. Would be good place although is pretty natural habitat already.

Potential development of micro hydro generation projects (would offer opportunity for fish ladders.

Pentland Project. Partial Restoration underway around new hospital(Niddrie Burn Section)- good potential for hospital and access connecting along catchment.

Potential for natural green networks connection and pedestrian link to Aberlady

Key Green network opportunity.

Pollution Issue. Elgin Hough. Issue on North Esk. Coal Authority trying to find land.

Big opportunity to improve landscape character & recreation amenities

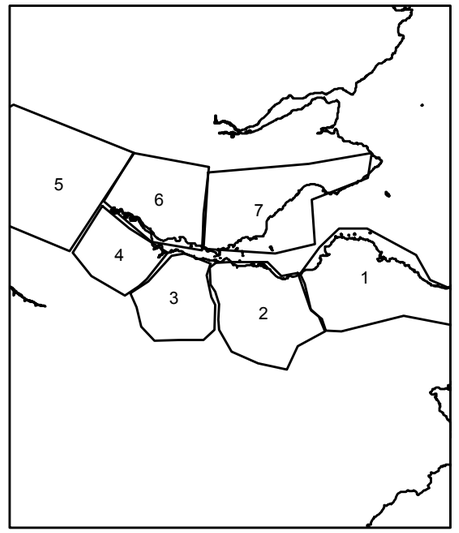
Key Green Network opportunity to connect Penicuik/ Pentlands.

Esk Valley Partnership Major. Project underway with landowners (as far as Mavisbark)

Key Woodland/ Green Network Link

0 1.75 3.5 7 10.5 14 17.5
Kilometers

KEYPLAN



LEGEND

Workshop Breakout Group Notes

Merged Workshop Notes

Raster250k

JBA consulting

Figure: E-2

Sites highlighted during workshop in Mid Lothian and Edinburgh

Bonny Water) - Project started to manage and control invasive species. No data available

Priority - Grange Burn. Flooding and social emphasis.

Dev Site

Falkirk Locally Designed Sites dataset available from Falkirk Council - Wildlife sites, LN

Linlithgow Loch. Nutrient & Morphological. Culvert CEH study. Flood Risk.

Future Development site. Urban P.P. Pressures & culverting from Deans on Dechmont Burn at Dechmont.

Hopetoun Estate ha a 5 year forest management plan.

INNS - Major problem on the River Almond. Plan / Studies/ Action.

Sprawling burn

Salmon in lower Logie water obstructed by large weir at confluence with Couston water (RFFT).

New M8 junction - see what is included as conditions on licence.

Lots of canal owned land in this area so restoration could be feasible.

Habitat network opportunities missed because of non-baseline.

FRC - Habitat enhancement opportunities.

Possible strateg green network li landscape improvement, recreation.

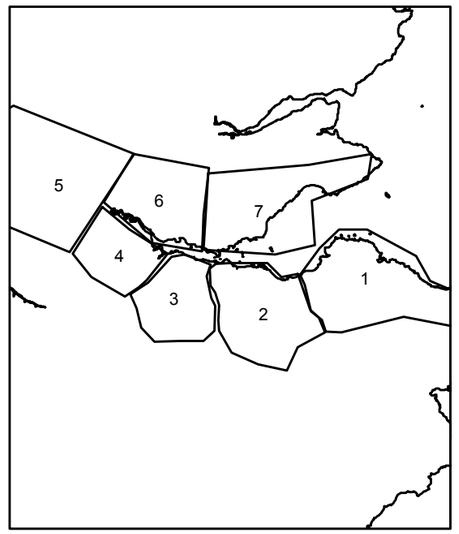
Big opportunity to improve landscape character & recreation amenities

Query Road Culvert?

0 1.75 3.5 7 10.5 14 17.5

Kilometers

KEYPLAN



LEGEND

Workshop Breakout Group Notes

Merged Workshop Notes

JBA consulting

Figure: E-3

Sites highlighted during workshop in West Lothian

Black Devon Wetlands. Regulated tidal exchange. Close to Alloa. Clacks Council/ RSPB

Forest Mill- Major Housing development. Opportunities for green infrastructure improvement.

Gartmorn Dam - Ranger involvement, Gartmorn Green Hub Report (2010) Mouchel. Hydrology, lakes & burns etc

Important local sites for a restoration - priority

Important local sites for a restoration - priority

River Carron & Tributaries (incl. Bonny Water) - Project started to map and control invasive species. INNS data available

Priority - Grange Burn. Flooding and social emphasis.

Dev Site

Linlithgow Loch. Nutrient & Morphological. Culvert CEH study. Flood Risk.

Falkirk Locally Designed Sites dataset available from Falkirk Council - Wildlife sites, LN

Sewage Cake. My worry is 1000's of tons of sewage cake is being dug into the ground on a very large scale. What will be the environmental impact in the years to come

Sprawling burn

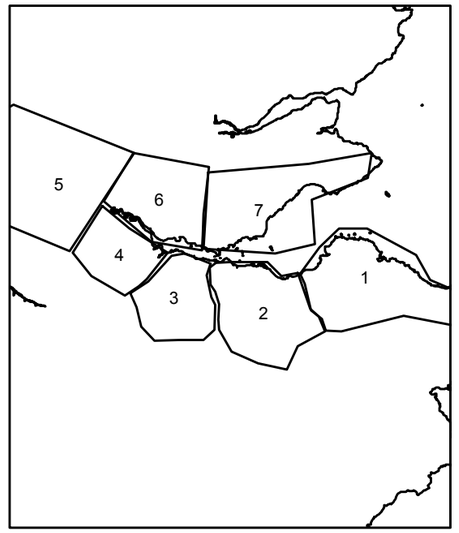
Salmon in lower Logie water obstructed by large weir at confluence with Couston water (RFFT).

New M8 junction -

0 1.75 3.5 7 10.5 14 17.5

Kilometers

KEYPLAN



LEGEND

Workshop Breakout Group Notes

Merged Workshop Notes

JBA consulting

Figure: E-4

Sites highlighted during workshop in N Lanarkshire and Falkirk

River Teith & Forth - issues at Callendar Flood risk

Flooding issues. Ochils Landscapes Partnership Projects (HLF funding) - riverbank stabilisation etc

Lake of Monteith - leaky doms - on areas on the Goodie Water – maybe missed because we have not looked at farmland.

Black Devon Wetlands. Regulated tidal exchange. Close to Alloa. Clacks Council/ RSPB

River Carron & Tributaries (incl. Bonny Water) - Project started to map and control invasive species. INNS data available

Important l sites for a restoration priority

Priority - Grange Burn. Flooding an social emphasis

Dev Site

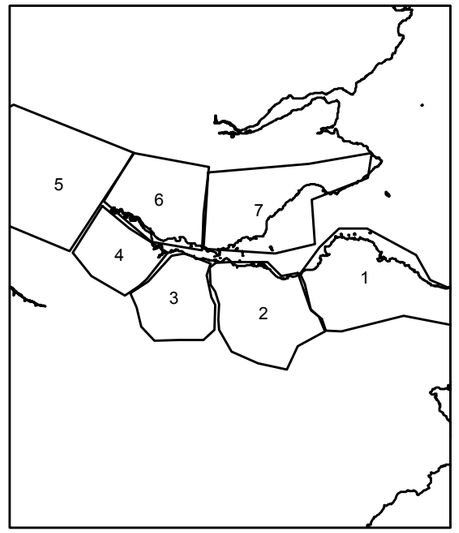
Falkirk Local Designed Si dataset avai from Falkirk - Wildlife site

Sewage Cake. My worry is 1000's of tons of sewage cake is being dug into

0 1.753.5 7 10.5 14 17.5

Kilometers

KEYPLAN



LEGEND

Workshop Breakout Group Notes

Merged Workshop Notes

JBA consulting

Figure: E-5

Sites highlighted during workshop in Stirling

Flooding issues. Ochils Landscapes Partnership Projects (HLF funding) - riverbank stabilisation etc

TAPIG- Take a pride in Glenrothes Fife Council/community group partnership for the Glenrothes area. Have funded pond (Stenton & riverside) and river (mink controls) projects. Looking to discover more biodiversity projects multiple benefit opportunity

Forest Mill- Major Housing development. Opportunities for green infrastructure improvement.

Lots of work has gone on here to improve water quality. Investment is not likely to yield significant results when to be self cleaned

Black Devon Wetlands. Regulated tidal exchange. Close to Alloa. Clacks Council/ RSPB

Gartmorn Dam - Ranger involvement, Gartmorn Green Hub Report (2010) Mouchel. Hydrology, lakes & burns etc

Will be drained-mitiga opportunities. Significant opportunities w Scottish Coal extraction.

Important local sites for a restoration - priority

Important local sites for a restoration - priority

Dunfermline West Strategic Development Area.

River Carron & Tributaries (incl. Bonny Water) - Project started to map and control invasive species. INNS data available

Priority - Grange Burn. Flooding and social emphasis.

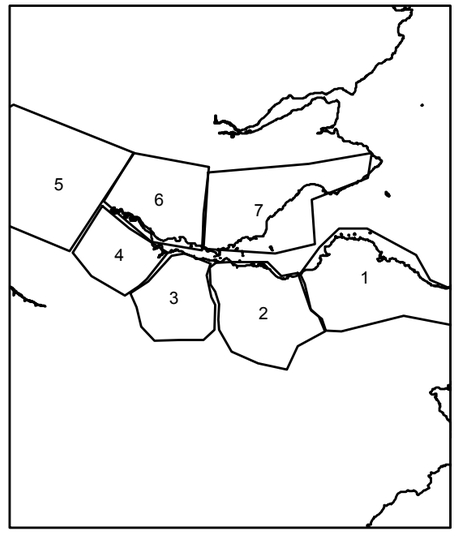
Linlithgow Loch. Nutrient & Morphological. Culvert CEH study.

Future Development

0 1.75 3.5 7 10.5 14 17.5 Kilometers

Designed Sites

KEYPLAN



LEGEND

Workshop Breakout Group Notes

Merged Workshop Notes

JBA consulting

Figure: E-6

Sites highlighted during workshop in Clacks and W Fife

TAPIG- Take a pride in Glenrothes Fife Council/community group partnership for the Glenrothes area. Have funded pond (Stenton & riverside) and river (mink controls) projects. Looking to discover more biodiversity projects multiple benefit opportunity

Kettle Produce. lots of irrigation and straightened burns

TAPIL - take a pride in Levenmouth partnership between Fife Council and local Community groups. Plan to undertake environmental improvement along River Leven- Particularly at the mouth from river banks to mink control. Fife Canal Contact Laura Dackea

INNS (giant hogweed & Himalayan Balson) and agricultural runoff. SEPA rejected initial applications for restoration funds as the scheme was not large scale enough.

TAPIG- Take a pride in Glenrothes Fife Council/community group partnership for the Glenrothes area. Have funded pond (Stenton & riverside) and river (mink controls) projects. Looking to discover more biodiversity projects multiple benefit opportunity

Major elopment. s for ructure t.

Lots of work has gone on here to improve water quality. Investment is not likely to yield significant results when to be self cleaned

Straightened

Loch Ore Meadows Nature Reserve receives 500,000 visitors per year. Restoration needed (See CE12).

Will be drained-mitiga opportunities. Significant opportunities with Scottish Coal extraction.

Dunfermline West Strategic Development Area.

Potential ecological impact of flood prevention works. Potential development of micro hydro generation projects (would offer opportunity for fish ladders.

Potential for natural green networks connection and pedestrian link to Aberlady

Hopetoun Estate has a 5 year forest management plan.

Future Development site. Urban P.P. Pressures & culverting from Deans on Dechmont

Hermitage of Braid. Under Braid Burn FPJ high velocity modelled through the woodland. CBA showed little could be done. Would be good

underway around new hospital(Niddrie Burn Section)- good potential for hospital and access connecting along catchment.

INNS - Major problem on the River Almond. Plan / Studies/ Action.

Key Green network opportunity.

INNS (giant hogweed & Himalayan Balson) and agricultural runoff. SEPA rejected initial applications for restoration funds as the scheme was not large scale enough.

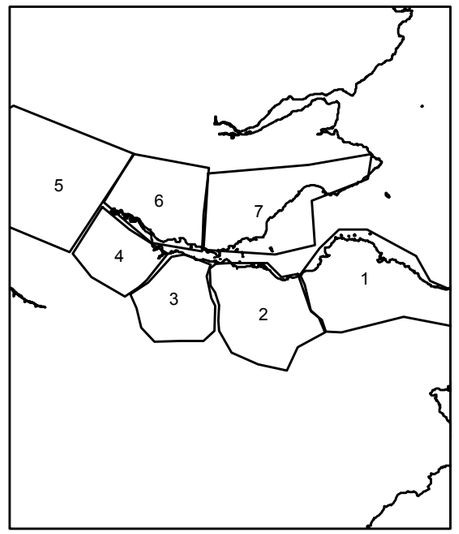
Good potential for local access improvements and links to uplands

0 1.753.5 7 10.5 14 17.5

Kilometers

Possible strategic

KEYPLAN



LEGEND

- Workshop Breakout Group Notes
- Merged Workshop Notes

JBA consulting

Figure: E-7

Sites highlighted during workshop in Central Fife

Offices at

Atherstone
Doncaster
Edinburgh
Haywards Heath
Limerick
Newcastle upon Tyne
Newport
Northallerton
Saltaire
Skipton
Tadcaster
Wallingford
Warrington

Registered Office
South Barn
Broughton Hall
SKIPTON
North Yorkshire
BD23 3AE

t:+44(0)1756 799919
e:info@jbaconsulting.com

Jeremy Benn Associates Ltd
Registered in England 3246693

Visit our website
www.jbaconsulting.com