



Water of Leith Management Plan

Draft

Prepared for

Water of Leith Action Group

By



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1. INTRODUCTION

This is a management plan for the Water of Leith. It is designed to last for a ten-year period (2010 – 2020) and covers all the major uses of and interests in the Water of Leith. It includes actions to deliver environmental improvement for the Water of Leith, whilst balancing the needs of all stakeholders and user groups.

The plan has been prepared for the Water of Leith Action Group (see Box 1) with funding from Scottish Natural Heritage and City of Edinburgh Council by Sue Bell Ecology. It is hoped that other stakeholders with an interest in the management of the river may wish to be involved in the implementation of the management plan.

1.1 Background to the plan

A number of agencies and organisations are currently involved in managing the river. Some of these, such as the Scottish Environment Protection Agency (SEPA) and the City of Edinburgh Council (CEC) have statutory responsibilities for aspects of the river's management, whilst others, such as the Water of Leith Conservation Trust (WoLCT), are voluntary organisations. A plan is needed to provide direction for all stakeholders and landowners over the future management of the river. Shared objectives and priorities will give clarity to the implementation of action along the river and a unified and agreed plan will mean greater support from all stakeholders. Defining roles and responsibilities and reporting on performance against objectives will deliver a more cohesive approach to the river's management.

It has been agreed by key stakeholders that the plan should be a working document that includes monitoring and is flexible enough to respond to funding opportunities, changes in key organisations and legislation.

1.2 Scope of the management plan

The plan focuses on management of the river from where it leaves Harperrig Reservoir, to where it enters Leith Docks at the Victoria Swing Bridge. It also considers some aspects of management of Harperrig Reservoir, and the Bavelaw Burn, which is a major tributary of the Water of Leith. Within this area, the main concentration has been on issues associated with the river between Balerno and Leith.

The Water of Leith Action Group identified a number of topics that should be addressed by the management plan: water quality, flow and flood prevention, biodiversity,

Box 1: Water of Leith Action Group

The Group was established in the 1980s and meets twice a year to discuss issues that affect the management of the river. Current membership includes:

Water of Leith Conservation Trust
Scottish Environment Protection Agency (SEPA)
Scottish Natural Heritage (SNH)
Forth Ports
Water of Leith Honorary Bailiffs
Scottish Wildlife Trust
City of Edinburgh Council: City Development;
Planning (Natural Heritage)
City of Edinburgh Council: Bridges and
Structures
City of Edinburgh Council: Flood Prevention
Team
City of Edinburgh Council: Services for
Communities; Environment (Countryside Ranger
Service)
Edinburgh Flood Prevention Group

geodiversity, habitat management and invasive species, access and recreation, planning and development, built heritage, landscape, archaeology, reservoirs, micro hydro, education and interpretation, and community involvement. These are all included in this plan.

1.3 Structure of the plan

This plan has been written for groups and organisations who are already involved in managing the Water of Leith, and who know and understand the issues that require to be addressed. These organisations have requested a management plan that is “action led”. For that reason this document starts with a summary of the key management issues and then presents a series of summary actions, which are contained in Tables depending on the priority with which each action should be implemented. Further background information for each subject area, including detailed assessment of objectives and management actions required for different interests, are contained in a series of supporting Topic papers. The structure of the document is:

- **Section 2** provides a brief overview of the management issues facing the river. These have been identified through consultation with the key stakeholders, and have been extracted from individual topic papers prepared for the plan (Sections 4 – 13).
- **Section 3** describes the vision, aims and objectives for the management of the Water of Leith, and includes the actions required to meet these. The actions are divided into a series of tables based on the urgency with which they should be implemented. These consolidated actions have been developed from the actions identified for each individual topic.
- **Sections 4 – 13** are the individual topic papers. Papers have been produced to address: management; biodiversity; fisheries; archaeology, cultural and built heritage; recreation and access; education and interpretation; geodiversity; landscape; planning; and water. Each paper summarises the historic and current situation, identifies current management initiatives, and includes aims and objectives for that topic and accompanying actions to achieve these.

Two Figures have been produced to accompany the plan. The first provides an overview of the environmental assets associated with the river, and shows the location of designated sites and features. The second shows the location of particular site management issues. These are bound separately.

2 SETTING THE SCENE

2.1 The Water of Leith

The Water of Leith flows over 24 miles (35km) from its source in the Pentland Hills to the Firth of Forth at Leith Docks. It passes through the historic villages of Balerno, Currie, Juniper Green, Colinton, Slateford, Roseburn, Dean Village, Stockbridge and Warriston. The Water of Leith walkway follows the course of the river for approximately 12¾ miles (18 km) from Balerno to Leith and passes through various City Parks and open spaces.

River flow is regulated via discharges from Harperrig Reservoir. The flow in the Bavelaw Burn, a major tributary of the Water of Leith, is also regulated via discharges from Harlaw and Threipmuir Reservoirs.

The upper reaches of the river lie within West Lothian Council jurisdiction, but the reservoirs themselves belong to the City of Edinburgh Council. The whole of the Water of Leith walkway lies within the City of Edinburgh Council area.

Numerous statutory and non-statutory designations are in place for parts of the Water of Leith. The river itself has been identified as a Local Biodiversity Site (LBS) and several protected species live along its banks. Sections of the river lie within an Area of Great Landscape Value (AGLV). Part of the river is within the Edinburgh World Heritage site. Scheduled Monuments, historic gardens and numerous listed buildings are also present along its banks. Further details of these designations can be found in the relevant topic papers, and the location of some of these environmental assets is shown on a Figure bound separately.

The river has a rich history dating back to pre-Roman times. There are numerous remains of the many mills that once worked the river. Today the river is used for recreation and access, providing a welcome open space through the heart of Scotland's capital city.

A number of organisations, agencies and individuals are involved in the river's management. The action of a number of these is co-ordinated through the Water of Leith Action Group.

2.2 Issues

Current issues for management of the river that have been identified during consultations for this project are:

Flood management: A major flood prevention scheme for the City of Edinburgh is being implemented. This has required purchase of, and modifications to Harlaw, Threipmuir and Harperrig Reservoirs, and will involve the construction of walls and other flood defence measures along lengths of the Water of Leith, and lowering of water levels in the reservoirs to increase storage capacity. The work has been subject to detailed environmental appraisal, and an Environmental Action Plan has been developed to mitigate likely adverse impacts. The main issues are related to the implementation of the works with the minimum environmental impact, the application of actions included in the Environmental Action Plan, and ongoing management of flows to reduce future flood risk.

Litter and debris: Litter and debris accumulate quickly at various locations along the river. The Water of Leith Conservation Trust organises around 50 clean-up operations annually along the river between Balerno to Great Junction Street, which reduces the amount of material that is swept down river. A collection boom has been installed at the entrance to Leith Docks to prevent it from entering the docks and creating a shipping hazard. Voluntary partnerships between the Council and private landowners have been established to remove the litter around Commercial Street and at a boom at the entrance to the docks. These appear to work well, but could be altered if there were changes in personnel or land ownership. There is a proposal to install a new boom at Commercial Street. The issue for the management plan is to continue to manage and remove the vast amounts of litter and debris that enter the river, in order to retain the aesthetic and water quality.

Micro hydro generation: The potential to introduce micro hydro schemes along the Water of Leith has been investigated. From a long list of 33 possible sites, 15 sites were considered to have the technical potential for hydro schemes. Five of these were considered to have the potential to be developed in the short or medium term: Harperrig, Harlaw, Balerno Bank, Mossy Mill and Dean Weir 2. Feasibility studies to implement schemes at Harlaw, Harperrig, Balerno Bank and Dean Weir 2 have been proposed. Such schemes have benefits in terms of promoting renewable energy, and in providing links with the river's past, but there are also issues relating to impacts on biodiversity, fish populations, and measures to "re-naturalise" the river to achieve good ecological potential under the Water Framework Directive.

Water Framework Directive: This Directive, which is implemented in Scotland through the Water Environment and Water Services (Scotland) Act 2003, requires the creation of a river basin planning system that will promote sustainable water use while protecting and improving the water environment, which is being co-ordinated by SEPA. An Area Management Plan for the Forth Area Advisory Group area which includes the Water of Leith catchment will be produced in 2010. This will include a range of local measures to drive improvements. These measures will be delivered by a range of responsible authorities and through working in partnership with local groups and individuals e.g. landowners. Actions for the Water of Leith will be included within these plans.

EU Floods Directive: This is implemented through the Flood Risk Management (Scotland) Act 2009, which states that Scottish Ministers, SEPA and responsible authorities (i.e. Councils) must "exercise their flood risk related functions with a view to reducing overall flood risk". It also says that they must

- "act in the way best calculated to manage flood risk in a sustainable way";
- "promote sustainable flood risk management";
- "act with a view to raising public awareness of flood risk; and"
- "act in the way best calculated to contribute to the achievement of sustainable development".

The main influences of the Council's functions on the management of the Water of Leith are:

- carrying out clearance and repair works where they would substantially reduce the risk of flooding;
- managing Harlaw, Threipmuir and Harperrig reservoirs in order to reduce peak flows in the river during a flood; and

- constructing flood defences under the confirmed Water of Leith Flood Prevention Scheme

Public involvement: Over 4000 hours of practical work are carried out by volunteers on the Water of Leith on an annual basis. This is in addition to volunteer hours provided in association with the City of Edinburgh Council Countryside Ranger Service, and volunteer hours spent in staffing the Water of Leith Visitor Centre. The issue for the management plan is to ensure that this resource is maintained and used effectively.

Access, recreation & interpretation: The walkway is used by local residents and visitors. The condition of the walkway is monitored frequently, and measures to maintain it in a safe condition are implemented. However, it is now some time since the walkway was completed, and some of the signs are missing, meaning that there can be confusion about access points. New street furniture and signs have been installed at various times, and this has led to a lack of consistency in features. For example, different styles of seat can be found within a few metres of each other. A Visitor Centre was constructed as part of the walkway Millennium project. This acts as a hub for education, recreation and information related to the river and the walkway. The issue for the management plan is to enhance the image of the Water of Leith through improved and consistent signage and interpretation, maintenance of a physical focal point from which education and information can be provided; and increasing opportunities for residents and visitors to learn about the river.

Invasive species: Invasive plant species are present at a number of locations along the river. A four-year project, funded by the Millennium Commission targeted Giant Hogweed (*Heracleum mantegazzianum*) along the river from 2000. The flood defence works have acted as a catalyst for action to eradicate invasive species in some areas, but action is required on lengths of river not affected by the flood defence works. Also, there is a need to ensure that the invasive species do not recolonise the river from other sites in the City and to ensure that there is a long-term strategy for the control of these species. Alien animal species are also present in and along the river. This includes bullhead (*Cottus gobio*), which is thought to be interacting with native fish populations, and mink (*Neovision vision*), which may be impacting on wildfowl populations. A better understanding of the impacts of these alien animal species is required.

Installation of a major new artwork: The National Galleries of Scotland has commissioned a major new artwork by Antony Gormley entitled "Six Times". The installation comprises 6 life-size statues, 4 of which will be located in the river itself. There are opportunities for working with the Galleries to attract new visitors to the walkway and in collaborative management of litter issues.

3 MANAGEMENT PLAN

3.1 Vision

Our vision is of a river that we can all be proud of, now and for the future: a river that is healthy, which flows through a green corridor from the hills to the sea, is a haven for wildlife, is enjoyed and managed by the public, and is valued for its built and cultural heritage.

3.2 Aims & Objectives

The overall aims and objectives for the river (across all interests) are:

1. To maintain and create a river that is as clean and natural as possible and reaches good ecological potential within the confines of an urban setting, whilst protecting homes and businesses from flooding.
2. Increase the level of co-ordinated action between all stakeholders who hold management interests in the Water of Leith.
3. To create a planning framework that will safeguard the special qualities of the Water of Leith including its integrity, tranquillity, amenity, historical, landscape and natural heritage value.
4. To promote awareness and understanding of all aspects of the Water of Leith's natural¹, built, cultural and historical heritage.
5. To safeguard and enhance the landscape character and visual amenity of the setting of the Water of Leith.
6. To safeguard and enhance the biodiversity quality of the Water of Leith, including management of invasive species.
7. To identify, safeguard and promote features of archaeological and cultural importance.
8. To improve the water and aesthetic quality of the Water of Leith.
9. To safeguard and enhance the Water of Leith as an urban game fishery.
10. To provide opportunities for people to use, enjoy, understand, and participate in the management of, the Water of Leith
11. To provide a walkway of high quality and promote its responsible use.

These 11 objectives have been developed by combining similar objectives for each of the individual sectoral interests that have been considered by this plan (See Sections 4 – 13). Further details of how a specific objective relates to a particular topic can be obtained by referring to the individual topic papers.

3.3 Actions

Actions required to meet these aims have been identified within individual topic papers prepared for this study (Sections 4 – 13). Some actions are common to more than one topic (e.g. actions relating to interpretation). Tables containing consolidated lists of all the actions are provided below. The actions have been sub-divided into six tables depending on the urgency with which they should be implemented. The categories are:

Current management actions – these are things that are already happening, and which it is anticipated will continue during the lifespan of the plan.

¹ Includes biodiversity, geodiversity and landscape

Actions already agreed for implementation 2010- 2011, or which can readily be introduced – there is already a commitment for these actions to happen. It also includes actions that could readily be introduced with current resources.

Short term – these are actions that should be implemented as soon as resources allow, and certainly by 2013.

Medium term – these are actions, which whilst important, are not the most pressing priority for action, but should be completed by 2017.

Long term – these are actions which may take more time to implement, or are of lower priority.

Actions to be implemented as opportunities or circumstances arise – this includes a number of actions which could be implemented at any time but require to be triggered by external factors.

Within each table the actions have been grouped to distinguish those items that are related to policy and planning from those that are practical in nature. The actions have been developed from the actions identified for each topic. Numbers in brackets after each action provide a cross-reference to the topic paper that has acted as a source for that action. For example W3 means that the action is listed as action W3 in the water topic paper. The original topic paper should be consulted for more information about the background to each action.

The agencies and organisations involved in the implementation of each action are also shown, with the lead agency identified in **bold** type. Targets for each action are shown in a separate column. The success of each action should be recorded against these targets on an annual basis.

The locations for particular actions are shown on the Figure entitled Site Management Initiatives.

3.3.1 Ongoing actions

It is important to recognise that there are many good management actions already in place for the Water of Leith. Table 1 highlights existing good management and the organisations involved in its implementation. It is anticipated that these actions will continue throughout the life of this plan.

Table 1: Current management actions, which it is anticipated will continue during the lifespan of this plan. (The Lead Agency is shown in bold type. Codes in brackets provide a link to the relevant topic paper (s) from which the action originates).

Action	Organisations involved (lead body shown in bold) ²	Milestones & targets
Actions relating to policy and planning (Codes in brackets indicate source of action)		
A1: Ensure that there is liaison between the WoLCT and CEC Countryside Ranger Service, & CEC Countryside Ranger Service and other Council Departments, concerning immediate management/maintenance concerns (See M4).	WoLCT, CEC CRS (Will require liaison with other Council Departments)	Weekly contact.
A2: Monitor the implementation of relevant policies in existing local plans (specifically those relating to Waterside development as applied to the Water of Leith). Monitoring should focus on how policies have been applied to decisions, and how these have been implemented on the ground. (See P1)	CEC City Development - Planning	Completed and approved development to be monitored in terms of relevant policies.
A3: Policy initiatives that promote and safeguard the Water of Leith as an important landscape, amenity, historical and natural heritage asset should be supported (e.g. Central Scotland Green Network). (See P2)	CEC City Development - Planning	a) Identification of all wider policy initiatives relevant to the Water of Leith. b) Participation in at least 2 policy initiatives.
A4: Continue to work in partnership and provide support for the Water of Leith Conservation Trust, Edinburgh World Heritage Trust & the Honorary Bailiffs (See P4).	CEC (various Departments)	Ongoing.
A5: Implement actions required under the Water Framework Directive as set out in the River Baseline Management Plan Water Body Information Sheets (See W7).	SEPA	See targets set in River Baseline Management Plan Water Body Information Sheets.
A6: Implement actions specific to the Water of Leith that are included in the Edinburgh LBAP, 2010 – 2015 (B2).	Various organisations	Targets included in LBAP.
Actions relating to practical projects		
A7: Monitor the physical condition of the walkway to ensure that it is safe and fit for purpose & complete actions in Water of Leith Maintenance Plan, including improvements to access points (R1 , R2 , R4).	CEC WoLCT, CRS,	a) Minimum of monthly checks. b) Completion of actions listed as priority 1 – 3. c) Completion of actions listed as priority 4. d) Completion of

² Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

Action	Organisations involved (lead body shown in bold) ²	Milestones & targets
		improvements to 2 – 3 access points.
A8: Implement a programme of events for volunteers including litter clean-ups, habitat management projects, assessments of condition & use etc. (See M3 , B9 , W13)	WoLCT, CEC CRS, PHRPRS	a) Targets to be set on annual basis through WoLCT Business Plan & CEC CRS work plan b) Annual habitat management project c) c. 50 litter collections per year.
A9: Provide visits and support to community groups (E1 , E4).	WoLCT, CEC CRS	Targets to be set annually in WoLCT business plan and CEC CRS work programme.
A10: Provide guided walks along the river on a variety of themes e.g. geology, biodiversity, cultural history (See B7 , H12 , E2 , G5).	WoLCT, CEC CRS , (Will require liaison with RIGS, CEC Archaeologist)	a) For specific initial targets for individual topics see individual action points (B7, H12, E2 & G5). b) Targets to be reviewed annually in WoLCT business plan and CEC CRS work programme.
A11: Provide education programmes linked to curriculum for excellence to school groups. To cover all topics e.g. cultural heritage, biodiversity (See B7 , H13 , E3).	WoLCT, CEC CRS	a) For specific initial targets for individual topics see individual action points (B7, H13, E3). b) Targets to be reviewed annually in WoLCT business plan and CEC CRS work programme.
A12: Undertake monitoring of fish populations (F1).	Honorary Bailiffs CEC Services for Communities. Potential for Student projects	a) Annual assessments. b) Maintain populations throughout river. c) Mixed age class fish. d) Catch per unit effort to be maintained.
A13: Undertake an annual programme of stocking	Honorary Bailiffs	Numbers to be

Action	Organisations involved (lead body shown in bold) ²	Milestones & targets
with brown trout. (F2).		determined on annual basis depending on monitoring data and fishing effort.
A14: Maintain programme of raking spawning beds. (F6).	Honorary Bailiffs	Major beds to be raked.
A15: Publicise the fishing on the Water of Leith through articles, notices etc. (F13)	Honorary Bailiffs, WoLCT, CEC CRS	a) Install 12No. notices per year at various locations. b) One article per year in the press.
A16: Continue to make the RIGS leaflet available at the Water of Leith Visitor Centre and CEC CRS Visitor Centre at Hermitage of Braid & monitor the number issued. (See G2)	WoLCT, CEC CRS,	Paper copies of the leaflet should always be on display and available to visitors.
A17: Implement programme of chemical and biological monitoring and assess against current standards (See W10).	SEPA	Meeting WFD targets.
A18: Manage river flows to minimise flood risk to homes and properties. (W6)	CEC City Development (will also require liaison with Forth Ports)	a) Flows meet other targets. b) Flood risk reduced from current levels.
A19: Litter and debris should be removed from the river (See W13, W14).	WoLCT, CEC Neighbourhood teams, CEC structures & flooding, Forth Ports, Water of Leith 2000	Targets are set for individual Action Points: a) Maintain programme of around 50 clean-ups per year organised by WoLCT. b) Discuss litter collection at stakeholder meetings. c) Collection methods agreed and implemented at booms.
A20: Remove, monitor and prevent the spread of invasive plant species (includes control measures implemented under the flood defence scheme and use of volunteers for hand pulling of Himalayan balsam). (B10, B11)	CEC City Development – Structures & flooding (until end of implementation of flood works only), WoLCT, Honorary Bailiffs, CEC CRS	Survey and undertake control work annually on both watercourses.

3.3.2 New Actions that are a priority for implementation

Table 2 lists actions that are already agreed and about to be introduced (e.g. in association with the flood defence works), or which could be introduced relatively quickly and easily with existing resources.

Table 2: Actions already agreed for implementation 2010 – 2011, or which can readily be introduced with current resource allocations. (The Lead Agency is shown in bold type. Codes in brackets provide a link to the relevant topic paper (s) from which the action originates).

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ³	Milestone & Targets
Actions related to policy and planning		
A21: Increase representation of different interests within the Water of Leith Action Group (WoLAG). A priority should be including archaeological/ cultural heritage expertise (See M1 , H8).	WoLAG Organisations who might be invited include CEC Archaeologist, HS	At least one cultural heritage representative on WoLAG.
A22: Expand stakeholder involvement in the sustainable management of the Water of Leith by instigating a Water of Leith stakeholders meeting ⁴ . (See M2 , H9)	WoLAG, WoLCT, Organisations who might be invited include CEC Archaeologist, HS, EWHT, Land owners & Managers, Pentland Hills Ranger Service)	a) Hold initial meeting (e.g. to discuss this management plan). b) Hold meetings on regular basis (either annually, or every two years – to be decided at first meeting).
A23: Develop a flow chart that clearly explains the different responsibilities with respect to the Water of Leith of each Council Department & circulate this within the Council and the Water of Leith Action Group (M6).	CEC City Development, CEC All Departments	Creation & distribution of chart.
A24: Seek funding to support the development of new interpretation materials and refresh of interpretation in the Water of Leith Visitor Centre. (See E6 , E13 , E14)	WoLCT	a) Achieve funding for (at least) one interpretation project. b) Refresh of interpretative displays in Visitor Centre.

³ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage

⁴ The meeting should be open to all organisations and groups who have a significant management role for the Water of Leith and would include (but may not be limited to), Pentland Hills Regional Park Ranger Service, Historic Scotland, National Galleries of Scotland, Rosebery Estates, Water of Leith 2000, CEC Services for Communities Neighbourhood Management Team leaders, CEC Forest Service, CEC Archaeologist, CEC Museums Service

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold)³	Milestone & Targets
A25: Participate in the development and implementation of the management plan for the Edinburgh World Heritage Site. (see H6)	CEC City Development - Planning , WoLCT, CEC Archaeologist, CEC Museums Service	Provision of comments relating to Water of Leith.
A26: Agree compensation flows post construction of flood defence scheme, which allow for ecological (including fish) requirements in the river and the reservoirs, and ensure that flows at Colinton are achieved by discharges along both the Bavelaw Burn and Water of Leith (See F10 , W5).	SEPA, CEC City Development - Structures & Flooding , Honorary Bailiffs	a) Flows are adequate to retain trout populations in the river. b) No adverse impacts on fish populations in reservoirs. c) Flow safeguarded in both river channels. d) Assessment of flow rates on levels in the reservoirs.
A27: Identify causes of water quality downgrading through actions identified by SEPA in Water Body information sheets (See W11).	SEPA , Scottish Water	Meeting WFD targets.
A28: Litter and debris should be collected at the boom near the Victoria Swing Bridge and near Commercial Street, through appropriate mechanisms including voluntary agreements between the council and private landowners. (See W14)	CEC Neighbourhood Teams, Structures & Flooding , CEC Forth Ports plc, Water of Leith 2000	a) Discuss litter collection at stakeholder meetings. b) Collection methods agreed and implemented.
Actions relating to practical projects		
A29: The implementation of mitigation, landscape and habitat restoration works associated with the Water of Leith flood prevention schemes should be monitored (See the Environmental Action Plan for the scheme). This includes monitoring of fish and invertebrates on the Water of Leith, water quality, and landscape (See B3 , B4 , F7 , L3 , W16).	CEC City Development - Structures & Flooding & Natural Heritage , SEPA, WoLCT, Honorary Bailiffs, Flood defence contractors	a) Two surveys of invertebrates and fish. b) Achievement of targets and actions in the Environmental Action Plan for the flood defence project.
A30: Identify opportunities to include details about the Water of Leith in interpretation material produced for other purposes e.g. information about public parks, in interpretation commissioned for “Six Times”, the Anthony Gormley statues. (See B5 , E12 , E16 , G6)	CEC Services for Communities (Parks & Green Spaces) , WoLCT, National Galleries	a) Information to be included as boards are updated in the Parks (e.g.

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ³	Milestone & Targets
	of Scotland , RIGS, PHRPRS	Saughton Park). b) Inclusion of information about the walkway in the “Six Times” information. c) Inclusion in material produced by the Pentland Hills Regional Park. d) Inclusion of information about geological features.
A31: Publicise the Water of Leith in the media (See E11).	WoLCT	To be set on an annual basis as per WoLCT business plan.
A32: Make copies of the brass rubbing trail available through the Water of Leith website (E19).	WoLCT	Trail available on website.
A33: Make copies of interpretation maps & materials available through relevant websites. E.g. RIGS geology leaflet (See E20 , G3).	WoLCT	Information to be available to download/ purchase via the website.
A34: To encourage the involvement by Saughton Prison in supporting biodiversity initiatives along the river e.g. construction of bird and bat boxes. (See B14)	CEC CRS, WoLCT, Saughton Prison Authorities	Construction and installation of bat and bird boxes.

3.3.3 Short Term

Table 3 lists actions for implementation during the short term, which has been defined as by 2013 for the purposes of this plan. They may be introduced earlier than this if opportunities arise.

Table 3: Actions to be implemented in the short term (by 2013). (The Lead Agency is shown in bold type. Codes in brackets provide a link to the relevant topic paper (s) from which the action originates).

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ⁵	Milestones & Targets
Actions related to policy and planning		
A35: Develop a system of collaborative working to enable sharing of digital data between different agencies and Council Departments involved in managing the Water of Leith (e.g. through the creation of a single GIS system or use of the Parks Asset Database Management System (ADMS) (See M5 , B8).	CEC – all relevant departments , WoLCT, SEPA, SNH, HS	a) Creation of data sharing protocol. b) Discussion of data sharing issues at stakeholder meetings.
A36: Identify new “outreach” centres, which will provide information about the river. e.g. RIGS geology leaflet. This should include existing Council resources and visitor centres (e.g. notice boards, Winter Gardens), facilities in the Pentland Hills, and new locations (e.g. National Galleries, cafés, libraries and new premises). (See M7 , E7 , E12 , G4 , G6)	WoLCT, CEC Parks and Green Space, CEC CRS, PHRPRS, National Galleries of Scotland, Lothian & Borders RIGS (Discussion will be required with potential “outreach” centres e.g. Forth Ports, cafés, private businesses etc.)	a) Distribution of walkway maps & RIGS leaflets through Saughton Winter Gardens. b) Installation of interpretation material in Saughton Park (as boards are updated). c) Installation of interpretation material in Roseburn Park (as boards are updated). d) Installation of materials in relevant libraries (e.g. Stockbridge, Leith). e) Establish two outreach centres.
A37: Revise the 1995 Water of Leith Landscape Resource Study to provide an updated base line with which to monitor landscape change and provide information to inform consultation response. (See L1 , P3)	CEC City Development - Planning , WoLCT	Completion of survey.
A38: Progress detailed surveys of gardens and designed landscapes of regional and local importance,	CEC City Development -	Completion of surveys.

⁵ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ⁵	Milestones & Targets
which lie on the Water of Leith corridor or within its immediate visual envelope. (see L2)	Planning	
A39: Develop and implement a strategy for weir retention/removal, which addresses weirs as barriers to fish passage and as potentially important cultural resources. This will require an audit of weirs along the river to identify their condition, cultural significance and impact on fish passage; a review of existing data on fish habitats to identify benefits of removing individual weirs; and stakeholder meetings. (N.B. the assessment of benefits to fish passage will need to be assessed within the context of barriers to fish passage presented by the lock gates at Leith) (See F9 , H2 W3).	SEPA, CEC City Development, CEC Archaeologist, Honorary Bailiffs, WoLCT, (May require liaison with Forth District Salmon Fishery Board/ River Forth Fishery Trust)	a) Conduct analysis of existing data relating to fish spawning habitat and barriers to fish passage. b) Conduct audit of weirs. c) Hold meeting to discuss strategy. d) Agree strategy.
Actions relating to practical projects		
A40: Prepare an audio trail(s) for the river, which can be downloaded from the internet. (B6 , H17 , E8 , G7)	WoLCT, CEC CRS. (Discussion will be required with CEC Archaeologist, HS) (Possible student media project?)	a) Completion of single trail covering all topics that can be downloaded from website. b) Preparation of trails for individual topics.
A41: Identify opportunities to deliver joint education programmes with other groups to provide “added value” (E5).	WoLCT, CEC CRS, PHRPRS, National Galleries of Scotland	One project per year.
A42: Refresh the interpretation material within the Water of Leith Visitor Centre. Include a panel/interactive display about geology and cultural heritage, litter, water quality and quality of biodiversity (See B5 , H15 , E14 , G1 , W15).	WoLCT, CEC CRS, CEC Archaeologist, CEC Museums Service, Lothian & Borders RIGS	a) Secure funding for refresh of materials. b) Implementation of new display on target topics.
A43: Monitor the location of spawning beds and trout habitat. (F8)	Honorary Bailiffs	a) Assessments at completion of flood defence works. b) Repeat assessment on 5-year cycle. c) No reduction in number of spawning beds
A44: To work with community police to encourage young people to take up fishing. (F12)	Honorary Bailiffs, Community	Seek funding to hold one event every

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ⁵	Milestones & Targets
<p>A45: Conduct an audit of cultural heritage resources associated with the river channel, including weirs & identify structures/ features of cultural importance that are in poor state of repair/ are at risk e.g. from erosion, self-sown trees etc. (see H1, and H3, H4)</p>	<p>Police</p> <p>CEC Development Department, CEC Archaeologist, EWHT, WoLCT, CEC Structures & Flooding, CEC CRS, CRC Forest Service.</p> <p>(Historic Scotland may be involved in relation to designated features) (SEPA may assist with assessment of weirs in relation to fish passage) (Will require liaison with Royal Commission for Ancient and Historic Monuments) (Discussion may be required with Scottish Civic Trust who compile the Risk Register for Historic Scotland) Scope for student project</p>	<p>two years.</p> <p>a) Seek funding for audit. b) Completion of audit. c) Produce schedule of features at risk. d) Produce work programme for addressing features at high risk.</p>
<p>A46: Introduce woodland management programme to safeguard cultural features at risk. (See H4, H5)</p>	<p>CEC Forest Service, CEC Archaeologist with support from, CEC Services for Communities, CEC CRS</p>	<p>Production of work programme to address trees of concern.</p>
<p>A47: Hold an exhibition of artefacts associated with the Water of Leith (H16).</p>	<p>WoLCT, CEC Archaeologist, CEC Museums Service</p>	<p>Hold exhibition</p>

3.3.4 Medium term

Table 4 lists actions for the medium term, which has been defined as by 2017, or before if opportunities arise.

Table 4: Actions for the medium term (to be implemented by 2017 at the latest).
(The Lead Agency is shown in bold type. Codes in brackets provide a link to the relevant topic paper (s) from which the action originates).

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ⁶	Milestones & Targets
Actions relating to policy and planning		
A48: Develop and implement an ecological management plan, which should include: <ul style="list-style-type: none"> • Identification of ecological management compartments along the river valley (to be conducted in conjunction with the survey of woodland along the river that has been conducted); • Identification of areas where there is the potential for habitat enhancement/creation or the restoration of habitat links; • Production of detailed ecological objectives and prescriptions for each management compartment⁷. The principle of establishing continuous riparian vegetation is likely to underlie these objectives (See B1). 	WoLCT, CEC Forestry Service, CEC CRS, CEC City Development	a) Identification of management compartments. b) Identification of areas with potential for habitat enhancement. c) Production of ecological objectives and prescriptions.
Actions relating to practical projects		
A49: Install orientation boards at key locations (E9 , G6).	CEC Services for Communities (Parks & Green Spaces), Lothian & Borders RIGS (Discussion will be required with CEC Archaeologist) Scope for private sponsorship.	Installation of five boards (Balerno, Saughton Park, National Gallery of Scotland, Stockbridge, Leith).
A50: Installation of additional signs (using the “brown waterwheel” logo (See R3 , E18).	CEC WoLCT	Installation of three new signs ⁸ .
A51: Establish a funding group to review options to	Honorary	a) Establish

⁶ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

⁷ This would need to interact with the Edinburgh Woodland Strategy, and the Environmental Action Plan for the flood defence works. It would provide the context for planning community based projects e.g. locations for wildflower planting, removal of invasive species, placing of bat boxes etc. It would also act as a mechanism to identify areas of land adjacent to the river, which are not in Council ownership, but where management arrangements with adjacent land owners should be established as a matter of priority. It should include details of locations suitable for habitat enhancement and provide detailed prescriptions to achieve this e.g. species mixes to use, methods of establishment, cutting frequency etc.

⁸ There are a number of locations where improved signage is required. Of these locations priority should be given to: (1) signage of the walkway in Leith (there are no signs north of Sandport Place), (2) within Saughton Park (3) off Balgreen Road, (4) Redbraes Weir. These are shown on the Site Management Issues Figure.

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ⁶	Milestones & Targets
obtain funding for additional activities beyond core functions of the Bailiffs (e.g. work with local Police). Possibilities to investigate include (a) weekend/evening classes in fishing (b) publication of a fishing guide (c) sponsorship by private companies (d) corporate hospitality events (See F5).	Bailiffs, CEC Services for Communities, WoLCT	funding group. b) Identify one new source of funding for additional activities.
A52: To establish links with landowners upstream of Balerno to work together on habitat improvements. (F11).	WoLCT, CEC Forest Service	a) Identify landowners. b) Hold meeting.
A53: Undertake a community archaeology project: (See H14).	CEC Archaeologist, WoLCT, CEC CRS, Volunteers & community groups. Scope for student involvement.	a) Establish steering group. b) Scope work. c) Secure funding. d) Completion of field investigations. e) Publication of results.
A54: Introduce system of monitoring usage of key sections (R8).	CEC CRS, WoLCT	Report identifying the nature and level of current use of the walkway.
A55: Conduct a review of improvements required to enhance accessibility of the walkway (R10).	CEC CRS	Production of report.

3.3.5 Long term

Table 5 lists actions, which whilst important, are not considered to be as high priority as those listed in the preceding tables. They should be implemented by 2020, and earlier if opportunities arise.

Table 5: Actions to be implemented in the long term (by 2020). (The Lead Agency is shown in bold type. Codes in brackets provide a link to the relevant topic paper (s) from which the action originates).

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ⁹	Milestones & Targets
Actions relating to policy and planning		
A56: Improve rate of angling returns. Options to investigate include: (a) establishing an on-line record system through the Water of Leith Conservation Trust website; (b) Twitter account (c) “returns” boxes in angling shops and visitor centre (d) Bailiffs keeping a record of catches made during their bank inspections. (See F4)	Honorary Bailiffs, WoLCT	Increase current rate of returns (c. 4 – 5%) by 5% per year.
A57: To assess the scale and impact of mink populations along the Water of Leith (B15).	WoLCT, CEC CRS, CEC City Development Opportunity for volunteer involvement/ student project.	Complete survey and assessment of mink populations.

3.3.6 Actions to be implemented as opportunities or relevant circumstances arise

There are a number of actions which, whilst they would achieve improved management of the Water of Leith, are not time-limited in terms of their implementation, or only require implementation under certain circumstances. These actions can be fitted into annual work programmes as opportunities arise. A number of these projects would be suitable for implementation by volunteers or through student projects. These are identified in Table 6.

Table 6: Actions to be implemented as opportunities or relevant circumstances arise. (The Lead Agency is shown in bold type. Codes in brackets provide a link to the relevant topic paper (s) from which the action originates).

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ¹⁰	Milestones & Targets
Actions linked to policy and planning		
A58: Support restoration programmes for notable buildings e.g. grottos in Craiglockhart and Colinton Dell, St Bernard’s Well, St George’s Well (See H7).	CEC Archaeologist, CEC Museums Service, CEC	a) Inclusion of St Bernard’s Well in the “Twelve Monuments”

⁹ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

¹⁰ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ¹⁰	Milestones & Targets
	City Development - Planning, Private groups & organisations (e.g. Dean Village Association) (HS may be involved for designated sites/grant applications).	project. b) Identification and support for one project.
A59: Ensure that heritage features associated with the docks e.g. bollards, mooring rings, cobbles, are incorporated within development proposals as set out in Leith Docks Development Framework. (See H10)	CEC City Development, CEC Archaeologist, developers	Review of all development proposals against design principles for Leith Docks Development Framework; explicitly those relating to incorporation of heritage features.
A60: Improve public access to historic buildings in public ownership (See H18).	CEC Archaeologist, CEC CRS, private and community groups	a) Facilitate access to St Bernard's Well at least 6 times per year. b) Facilitate access to one new location e.g. St George's Well.
A61: Oppose any further culverting and seek to remove existing culverting where possible including on tributary burns (See W1).	CEC City Development - Planning, SEPA	No increase in the number of culverts.
A62: Support the implementation of objectives in the Scotland River Basin Management Plan prepared by SEPA, particularly with respect to reducing pressure on beds and banks of rivers and bank vegetation. E.g. ensure that development and use does not encroach on areas required by the river for natural processes e.g. near Saughton Prison (subject to the requirements of the flood defence scheme) (See W2).	CEC City Development - Planning, SEPA	a) Undertake survey to identify areas (some Geomorphological data already exists). b) Produce maps showing key areas. c) Use maps to inform planning process. d) Monitor success via WFD process.
A63: Undertake ecological checks prior to all maintenance dredging in the river channel (excludes dredging within docks area, which is consented via a separate process) (See W4).	CEC Structures & Flooding, Private landowners	Maintain register of checks.
A64: Opportunities to upgrade CSOs should be identified and implemented as part of other development initiatives, where possible (See W12).	SEPA, Scottish Water, CEC City Development - Planning	Meeting WFD targets.
A65: Safeguard water quality through reporting all	All organisations	Number of

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ¹⁰	Milestones & Targets
suspected pollution incidents to SEPA (See W8).	and individuals	incidents recorded.
A66: Raise public awareness of procedure for reporting suspected pollution incidents (See W9)	SEPA , WoLCT, Honorary Bailiffs	Production of awareness-raising materials
A67: All new and novel uses of the river should be fully assessed for their impacts on natural, cultural and amenity use of the river. (See W17)	CEC City Development , WoLCT, SEPA	All new proposals to be checked against planning objectives and the objectives in this plan.
Actions relating to practical projects		
A68: Digitise biodiversity data collected by the Water of Leith Conservation Trust. Digitisation should enable easy sharing of data by relevant bodies (e.g. CEC CRS are using Recorder 6, and data should be shared with Lothian Wildlife Information Centre & NBN Gateway) (See B13).	WoLCT Opportunity for volunteer involvement	All data sets digitised.
A69: Expand the range of information leaflets produced (e.g. a leaflet that focuses on historical and cultural aspects and how these relate to the development of the City of Edinburgh such as the parallel development of paper mills with printing presses in the City) (See B5 , H11 , E15).	WoLCT, CEC Archaeologist, CEC museums service	Production of 2 leaflets during lifespan of this plan.
A70: Provide free walkway maps to B&B and hotels near the route. (R11 , E10).	WoLCT , VisitScotland Opportunity for volunteer involvement	Distribution of 100 maps to tourism businesses adjacent to the river.
A71: Promote a project to explore the impact of bullhead and/or grayling on trout populations (requires the development of a brief, & possibly seeking funding) (See F3).	Honorary Bailiffs , Opportunity for student project	Understanding of relationship between bullheads and trout in the

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ¹⁰	Milestones & Targets
A72: Replacement of existing signs that do not fit the “brown waterwheel” brand ^{11,12} (See R13 , E17).	CEC CRS , WoLCT	Water of Leith. Any new or replacement signs along the route should bear the “brown waterwheel”. This does not mean the wholesale replacement of all existing signs. All new signs that are introduced (either in new locations or as replacements for existing signs), then these should be of a consistent style. The historic cast iron signs should be maintained.
A73: Analyse data concerning use of the Walkway that is collected by WoLCT volunteers. (M8 , R9)	WoLCT Opportunity for student project.	Production of report detailing uses.
A74: Identify potential new access points and circular routes (including upgrading existing routes such as Poet’s Glen) to provide links between different footpaths. (R5 , R6 , R7)	WoLCT , CEC City Development , CEC CRS , PHRPRS	a) Identification of 2 new access points. b) Identification and publication of one route. c) Upgrade Poet’s Glen route.
A75: Restrict approval for increased lighting on the walkway to avoid adverse impacts on bat feeding and to maintain rural character of parts of walkway (to be informed by landscape character assessment (see Action L1) and ecological management plan (see Action B1) (See R12).	CEC City Development , CEC CRS , WoLCT	No increase in lit areas in a) areas important for bat feeding; b) areas identified as of rural character in landscape character assessment.
A76: Create a unified “feel” for infrastructure linked to the Water of Leith (R13).	CEC CRS	a) Removal of signs that do not fit with the “brown waterwheel” logo. b) All seats within sight of each other

¹¹ This does not mean the wholesale replacement of all existing signs. All new signs that are introduced (either in new locations or as replacements for existing signs), then these should be of a consistent style. The historic cast iron signs should be maintained.

¹² Signage in Colinton & Craiglockhart Dell is a different style to that used along the walkway (wood signs), blue waymarker signs are used at other locations e.g. near Sandport Place. As a minimum, the Water of Leith logo could be added to these existing signs to retain continuity of the brand. A good example of this is the use of the national cycle route markers on existing signs.

Action (Codes in brackets indicate source of action)	Organisations involved (lead body shown in bold) ¹⁰	Milestones & Targets
		to be in the same style. N.B. refers to new and replacement features only; does not require the replacement of existing furniture that remains in good condition and fit for purpose.
A77: Establish a co-ordinated framework for the management of invasive species (part of LBAP) (B12).	CEC City Development	a) Formation of steering group. b) Development of strategy.

3.4 Implementation and Monitoring

This plan will be implemented over the next ten years (2010 – 2020) by the Water of Leith Action Group Members, with assistance from other agencies as necessary. Responsibility for individual actions within the plan has been assigned to specific agencies, but it is anticipated that many of the actions will require collaborative working.

The Action Group members will agree which actions are to be implemented each year. Monitoring success against each individual action will be the responsibility of the names lead organisations. Progress will be reported annually, either at one of the meetings of the Water of Leith Action Group, or in a wider stakeholder meeting.

A master list of progress against each action will be maintained by the Water of Leith Conservation Trust.

TOPIC PAPERS

4. MANAGEMENT

This topic paper provides an overview of some of the different organisations that are involved with managing the Water of Leith, and focuses on issues relating to how these agencies interact. It is not a comprehensive review of all organisations involved in the river's management, but focuses on those currently involved in the Water of Leith Action Group, and highlights additional organisations most likely to be involved in the implementation of this management plan.

4.1 Current situation

Water of Leith Action Group Members

The Water of Leith Action Group was formed in the 1980s. It was established to discuss issues relating to the management of the Water of Leith. The group meets twice a year. Membership involves The Water of Leith Conservation Trust, Scottish Environment Protection Agency, Scottish Natural Heritage, Forth Ports, Water of Leith Honorary Bailiffs, Scottish Wildlife Trust, City of Edinburgh Council Departments of City Development – Planning (Natural Heritage), Bridges and Structures, Flood Prevention Team, and Services for Communities – Environment (Countryside Ranger Service) and the Edinburgh Flood Prevention Group.

The Water of Leith Conservation Trust

The Water of Leith Conservation Trust was established in 1988 as Scotland's first river Charity. It works to conserve and enhance the river, its heritage and wildlife. The Trust's mission is to conserve and enhance the Water of Leith as a haven for biodiversity and be an educational and recreational resource for all.

The Trust's main areas of operation are promotion of education and recreation through the Visitor Centre, and delivery of practical management, principally litter clean-ups and habitat improvement. It also acts as a consultee on planning applications and projects that affect the river.

One of the most visible areas of work of the Trust is in removing litter from the river. In 2008/09, 700 cubic metres of rubbish were removed from the river during 50 river clean-ups, equating to around 4000 hours of volunteer help¹³. The work is undertaken by community groups and members of the public, co-ordinated by Trust Staff. The work receives some financial support from the City of Edinburgh Council and Scottish Natural Heritage.

The Trust has organised volunteer projects to remove Himalayan Balsam by hand.

The Water of Leith Conservation Trust also carries out inspections of the watercourse. These are conducted by volunteers, and in the order of 600 inspections are completed per year. Volunteers complete a pro-forma to record details of condition of the infrastructure, uses and activities of the walkway, and wildlife seen. A large amount of data exists, but now requires to be analysed.

¹³ WoLCT Business Plan

Scottish Environment Protection Agency

The Scottish Environment Protection Agency (SEPA) is Scotland's environmental regulator, with a role of protecting and improving the environment. It is a non-departmental public body, accountable through Scottish Ministers to the Scottish Parliament. It operates by regulating activities that can cause harmful pollution and by monitoring the quality of Scotland's air, land and water.

In relation to the Water of Leith, SEPA's main management functions include monitoring the quality of the river through various sampling programmes, authorizing discharges to the river, and for implementing the Water Framework Directive. Further details of the Water Framework Directive and its implications for the river are contained in the [Water](#) Topic paper.

Scottish Natural Heritage

Scottish Natural Heritage (SNH) is a Government body responsible to Scottish Government Ministers and through them to the Scottish Parliament. It was established in 1992 through the Natural Heritage (Scotland) Act 1991. Its main functions are to look after the natural heritage, help people to enjoy and value it, and encourage people to use it sustainably. Its responsibilities encompass flora, fauna, habitats, landforms, soil and geological features and landscapes. SNH operates at a policy level, acting as an advisory body to Ministers. It also designates sites for their natural heritage value, for example, as Sites of Special Scientific Interest and ensures that protected species are maintained. SNH also supports delivery on the ground through practical action and influencing land management.

Forth Ports PLC

Forth Ports PLC ("Forth Ports") is a private company that operates Leith Docks. The property division is involved in the long-term development and regeneration of waterfront sites within its ownership to promote a series of integrated communities.

Forth Ports is a major landowner and is instrumental in development in the Dock Area. With respect to the Water of Leith it has two important roles: assistance with collection of litter at the Victoria Swing Bridge and regulation of water flow at the dock gates.

Water levels in the harbour are maintained through regulating loss of water from the Water of Leith through sluices in the retaining dam and lock gates. Forth Ports constantly monitors telemetry data collected by the City of Edinburgh Council in order to determine peak flows. The harbour is able to store large quantities of water, and prior to anticipated flood events in the City, the water levels in the docks can be lowered to provide storage capacity. This system has operated since the 1960s.

Forth Ports operate a boom to trap litter and debris before it enters the harbour, where it would create a hazard to shipping.

Forth Ports also own much property in the Dock area. This includes a suite at Rennie's Isle, which might have potential as an outreach centre (see [Section 9.2](#)).

Water of Leith Honorary Bailiffs

The Honorary Bailiffs manage the brown trout fishery on the Water of Leith, on behalf of the City of Edinburgh Council. Further details are contained in the [Fisheries](#) Topic paper (Section 6).

Scottish Wildlife Trust

The Scottish Wildlife Trust is a membership-based registered charity with the objective to “*advance the conservation of Scotland’s biodiversity for the benefit of present and future generations.*” Its work is underpinned by a 25-Year Vision to re-establish: “*a network of healthy and resilient ecosystems supporting expanding communities of native species across large areas of Scotland’s land, water and seas.*”

The Trust was instrumental in establishing co-ordinated management of the Water of Leith and produced the first Integrated Environmental Action Plan¹⁴ for the River in 1993.

City of Edinburgh Council

The Council has a significant role to play in managing the Walkway, areas of land and aspects of the river. Council services are divided into a number of divisions and departments.

City Development

City Development is responsible for a range of services relevant to the Water of Leith including development planning, economic and property development, emergency planning and public safety, planning applications, property conservation, road design and tourism development. It is the department that is responsible for guiding and regulating development along the river corridor, for implementing the flood prevention scheme and taking the lead on biodiversity action planning for the City.

The flood prevention works are a major area of works for the structures & flooding section. Management of invasive species (principally Giant Hogweed) along the river are forming part of the works.

Services for Communities

This Department delivers at a Neighbourhood level, a range of frontline services to maintain areas in a clean and safe condition. These services include: street cleaning, street lighting, road repairs and park management. It is divided into four divisions: Housing and Regeneration, Environment, Community Safety and Performance and Community Engagement.

City wide services such as Allotments, Forestry and the Countryside Ranger Services are managed centrally by the Parks and Greenspace Section.

The Countryside Ranger Service is responsible for the conservation and management of the city's wildlife and natural resources and Natural Heritage Parks according to the Parks and Greenspace strategy. It undertakes environmental education, interpretation of the sites, conservation and habitat management, community involvement through the creation of opportunities for volunteers to participate in practical conservation, and estate management. It also operates visitor centres at the Hermitage of Braid and the Cammo Estate. The Countryside Rangers undertake monthly inspections of the Walkway to check for safety, litter and maintenance issues. Small scale maintenance can be undertaken directly by the Countryside Rangers, but larger scale work (e.g. removal of large trees) is carried out by the relevant Council departments. Management of the resource is also limited by the extent of the Council’s land ownership. If safety works or other management is required on sections not in Council ownership, the Council will liaise with the relevant land owner.

¹⁴ Edwards-Jones, 1993

Collection of litter and debris from the river is a responsibility of different elements of this department. In practice, most litter from the river channel is collected by the Water of Leith Trust during river clean-ups, but the Council also assists in removing large items that accumulate at Leith, and there is a proposal to install a new litter boom by the bridge at Commercial Street. Other managers of the river, notably Water of Leith 2000 and Forth Ports also undertake a litter collection role.

Community Parks Officers undertake the management of adjacent parks to the Water of Leith, with the exception of Colinton and Craiglockhart Dells, there work includes assessments of tree safety and condition, and the condition of pathways. Their work is complemented by that of the Open Space Maintenance Team, who look after the grass cutting, shrub pruning, flower bed planting and maintenance, hedge cutting and sport pitch markings in the City's parks and open spaces. Several of the parks are being managed with the aim of obtaining Green Flag status, which recognise and rewards the best green spaces in the country.

Litter, encroachment of vegetation over the walkway, and the quality of the footpath are the three most common issues that the public contact the park managers about. Gullies along the walkway are not adopted, and do not receive routine maintenance.

The Council's Forest Service is currently preparing a Forestry Strategy for the City. The Council owns the brown trout fishery.

In practical terms this means that the Council utilises a number of professional departments and specialists in ensuring the appropriate management of the Water of Leith. For example:

- Countryside Rangers are responsible for the walkway and sections not contained within a formal park;
- Community Park Officers (various Neighbourhoods) are responsible for parks that are adjacent or next to the Water of Leith
- Forestry are responsible for trees that do not constitute a flood risk
- Task Force (Various Neighbourhoods) are responsible for the emptying of bins
- Flood Prevention are responsible for the removal of trees and obstacles that constitute a flood risk
- Bridges and Structures are responsible for bridges and structures that cross the river at various points.

Edinburgh Flood Prevention Group

This group was set up soon after the April 2000 floods along the river. Its aim is to press for flood prevention measures. It has held many meetings with CEC officials and other bodies to reduce flood risk and has appeared at the public inquiry into the flood prevention scheme.

Other organisations with a key influence on management

Historic Scotland

Historic Scotland is an executive agency of the Scottish Government, which is charged with safeguarding the nation's historic environment and promoting its understanding and enjoyment on behalf of Scottish Ministers. It delivers policy and advises on all aspects of the historic environment. It schedules sites of national importance (Scheduled Ancient Monuments), and structures of architectural or historical significance. It also has responsibility for historic gardens and designed landscapes.

Its role in relation to this management plan is to review any applications that would affect scheduled monuments or listed buildings near the route, and to comment on applications that would impact on historic gardens and designed landscapes.

World Heritage Trust

Edinburgh World Heritage was created in 1999 by a merger of the Old Town Renewal Trust and the New Town Conservation Committee. The organisation is a charitable company limited by guarantee. It is governed by a Board of Directors, and is funded by Historic Scotland and the City of Edinburgh Council. Its primary purpose is the management, protection, enhancement and promotion of the Site. The aims of Edinburgh World Heritage are to champion and represent the World Heritage Site and to monitor its state of conservation as required by UNESCO; co-ordinate action, through the Management Plan, to protect and enhance the outstanding universal values of the World Heritage Site and to promote its harmonious adaptation to the needs of contemporary life; and to conserve and enhance the historic fabric and historic environment of the World Heritage Site through a programme of financial assistance.

A new management plan is currently in preparation; more details can be found in the topic paper.

City of Edinburgh Council Archaeology and Museum Services

Based at the Museum of Edinburgh in the Canongate, the City of Edinburgh's Archaeological Service is responsible for investigating and preserving local sites of interest.

Land owners

Whilst the Council owns some of the land adjacent to the river and walkway, it is not the only owner. The scale of land ownership varies from individual garden plots, to larger lengths of river bank and associated fields. Those owners, who may have a particularly important role to play in the management of the river are Rosebery Estates, Water of Leith 2000 and Forth Ports (who are members of the Water of Leith Action Group).

Rosebery Estates own significant parcels of land around Harlaw Reservoir and along the upper reaches of the Water of Leith. Substantial parts of this land are wooded, and add to the biodiversity value of the walkway and river channel.

Water of Leith 2000 owns part of the river, extending from the weir near West Bowling Green Street to the Victoria Swing Bridge. The company has introduced boat-based offices into the lower basin of the river, and has plans to extend these. It also fulfils an important role in litter and debris control. It carries out weekly inspections and collections of small debris, and liaises with the Council for removal of larger items.

4.2 Objectives and actions

Aims & objectives: To achieve co-ordinated action between all stakeholders who hold management interests in the Water of Leith.

Specific objectives for management are:

- Expand stakeholder involvement in the sustainable management of the Water of Leith.
- Improve current systems for collaborative working within and between agencies involved in managing the Water of Leith.
- Improve knowledge about the way in which the Water of Leith is used.

Rationale: Various organisations have an interest in, and responsibility for, the management of the Water of Leith. Systems that allow collaborative working between these organisations to achieve mutually beneficial aims are in place and have led to the development of this management plan. This plan has identified additional organisations with which links could be created.

Actions to achieve co-ordinated action between all stakeholders who hold management interests in the Water of Leith (Lead agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A21).

Action	Lead Agency & partners ¹⁵	Targets
M1: Increase stakeholder involvement in the sustainable management of the Water of Leith by including archaeological/ cultural heritage expertise within the Water of Leith Action Group. (A21)	Water of Leith Action Group Members (Organisations to invite could include: CEC Archaeologist, Historic Scotland).	At least one cultural heritage representative on WoLAG.
M2: Expand stakeholder involvement in the sustainable management of the Water of Leith by instigating a Water of Leith stakeholders meeting ¹⁶ . (A22)	WoLAG, WoLCT Organisations who might be invited include CEC Archaeologist, HS, EWHT, Land owners & Managers, Pentland Hills Ranger Service)	a) Hold initial meeting (e.g. to discuss this management plan). b) Hold meetings on regular basis (either annually, or every two years – to be decided at first meeting).
M3: Maintain the current programme of events for volunteers including litter clean-ups, habitat management projects etc. (A8).	WoLCT, CEC CRS, PHRPRS	Refer to targets for volunteer activities and events in the WoLCT Business Plan & CEC CRS work plan.
M4: Maintain the current regular contact between the WoLCT and CEC Countryside Ranger Service to discuss immediate management/maintenance concerns. Also ensure contact between CEC CRS and other Council Departments (Included as A1 in combined list).	WoLCT, CEC CRS (Will require liaison with other Council Departments)	Weekly contact.
M5: Develop a system of collaborative working to enable sharing of digital data between different agencies and Council Departments involved in managing the Water of Leith (e.g. through the creation of a single GIS system or use of the	CEC (various departments), WoLCT, SEPA	a) Creation of data sharing protocol. b) Discussion of data sharing issues at stakeholder meetings.

¹⁵ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

¹⁶ The meeting should be open to all organisations and groups who have a significant management role for the Water of Leith and would include (but may not be limited to), Pentland Hills Regional Park Ranger Service, Historic Scotland, National Galleries of Scotland, Rosebery Estates, Water of Leith 2000, CEC Services for Communities Neighbourhood Management Team leaders, CEC Forest Service, CEC Archaeologist, CEC Museums Service.

Action	Lead Agency & partners ¹⁵	Targets
Parks Asset Database Management System (ADMS) (A35).		
M6: Develop a flow chart that clearly explains the different responsibilities with respect to the Water of Leith of each Council Department & circulate this within the Council and the Water of Leith Action Group (A23).	CEC Development Department, CEC All Departments	Creation & distribution of flow chart.
M7: Use existing Council resources and visitor centres to better promote the Water of Leith walkway ¹⁷ (A36).	WoLCT, CEC Parks & Green Space,	<ul style="list-style-type: none"> a) Distribution of walkway maps through Saughton Winter Gardens. b) Installation of interpretation material in Saughton Park. c) Installation of interpretation material in Roseburn Park. d) Installation of materials in relevant libraries (e.g. Stockbridge, Leith).
M8: Analyse data collected by WoLCT during routine river inspections (A73).	WoLCT Possible student project	Production of report detailing uses.

¹⁷ For example, make copies of the Water of Leith map available through the Winter Gardens in Saughton, introduce interpretation boards in the major parks (Saughton, Roseburn, St Marks) that highlight how that park fits into the Water of Leith walkway.

REFERENCES

Edwards-Jones, E. 1993. The Water of Leith Integrated Environmental Action Plan. Scottish Wildlife Trust

Water of Leith Conservation Trust. 2009. Business Plan 2010 – 2013. Draft

5 BIODIVERSITY, HABITAT AND SPECIES MANAGEMENT

This topic paper reviews issues related to biodiversity resources along the Water of Leith Corridor. It does not attempt to provide a full description of all the wildlife present, but focuses upon key species and habitats, and issues for the management plan. Issues related to fish stocks are dealt with in the [fisheries](#) topic paper.

5.1 Historical Context/Current situation

There have been numerous surveys and assessments of wildlife present along the Water of Leith. Descriptions of the plants, fungi, birds, mammals, fish and invertebrates associated with the whole river were provided in “*The Water of Leith*”¹⁸. Surveys of the habitats, river corridor, birds, water vole, otter, badger, bats and aquatic invertebrates were conducted of sections likely to be impacted by the flood defence works¹⁹. Several surveys have been undertaken by the Water of Leith Conservation Trust, including details of water plants, plants along the walkway and records of animal sightings²⁰. These sources have been used, supplemented with observations made during site visits for this study, to produce the following summary.

Habitats

Above the reservoirs the river flows through areas of upland grassland and heathland²¹. The vegetation around Harperrig is neutral grassland, which is heavily grazed, with large areas of marshy grassland²². An area immediately to the west of the reservoir has been identified as a Local Nature Reserve (see below) and supports a range of habitats including marsh and swamp, plantation woodland and shelterbelts. Between Harperrig Reservoir and Balerno the river flows through areas of agricultural grassland. Downstream from Balerno the main habitat type is woodland, and there is almost continuous tree cover from here to near Leith. The river flows through a number of the City’s parks, including Saughton, Roseburn, Rocheid, and St Mark’s, which are managed by the City Council’s relevant Neighbourhood Community Parks Officers, and include areas of mown amenity grassland and formal planting. Few other habitats are supported through the City²³, apart from the river channel itself.

Woodland

Woodland and individual trees close to the water course were assessed as the habitat of greatest value to wildlife during the environmental assessment for the flood defence works⁶. The woodland comprises areas of broadleaved semi-natural and broadleaved plantation and coniferous woodland. Some of the planted areas are policy woodlands associated with historic estates. There are also areas of self-seeded trees. The Integrated Environmental Action Plan (IEAP)²⁴ for the Water of Leith notes that stretches of the woodland between Blinkbonny and Woodhall Mains are listed in the NCC ancient woodland survey as long-established or semi natural origin or ancient. Parts of Colinton Dell are also listed in the ancient woodland inventory as being ancient woodland (since 1600 but may be older) or long established²⁴.

¹⁸ Ed. S. Jamieson, 1984

¹⁹ Heritage Environmental, 2001 & JDC Ecology, 2002a

²⁰ Water of Leith Conservation Trust, unpublished data, various dates

²¹ Scott, 1984

²² West Lothian Council *et al*, 2009

²³ Arup, 2003a

²⁴ Edwards – Jones, 1993

The planted origin of many of the trees means that a wide range of species may be encountered. At the time that the last management plan was prepared for the river, the main species recorded were sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*) and elm (*Ulmus* spp.) with willows (*Salix* spp.) and alder (*Alnus glutinosa*). Thirty four tree and shrub species were recorded by the Water of Leith Trust in 2008-09. This includes native species (such as silver birch, *Betula pendula*), garden escapes (e.g. lilac, *Syringa* spp.), and introduced species (e.g. horse chestnut, *Aesculus hippocastanum*). Hornbeam (*Carpinus betulus*), which produces a very hard wood, and can be used to make wooden parts for mills, is present at a number of locations. New areas of woodland were planted in 1992 upstream and downstream of Bonnington Bridge⁷ and there has been new woodland planting in Colinton and Craighlockhart Dells.

A management plan for woodland in Colinton and Craighlochart Dells has been prepared²⁵. There is also a habitat management plan for Poet's Glen, which is mainly wooded²⁶.

There has been an ongoing programme to remove diseased elms from Edinburgh's woodlands. The IEAP⁷ noted that sycamore is likely to invade those areas where elms had been removed.

In some locations (e.g. adjacent to Saunders Street), trees have grown within the edge of the river channel and at the base of retaining walls.

River Channel

River corridor surveys of the channel have been carried out as part of the flood defence works²⁷. Emergent and aquatic vegetation occurs at several locations throughout the urban area.²⁸

Species

Aquatic invertebrates

Invertebrate populations are sampled by the Scottish Environment Protection Agency (SEPA) as part of their monitoring programmes for the river. More details of this can be found in the [Water](#) topic paper. A summary of invertebrate populations in the river is provided in "*The Water of Leith*"²⁹. The upper reaches of the river, between Harperrig and Balerno supported 60 species of invertebrate, including stoneflies (*Plecoptera*) and mayflies (*Ephemeroptera*) which are indicators of good water quality. The numbers of invertebrate species drops to 46 for the stretch between Balerno and Juniper Green, due to changes in water quality. The numbers of species decrease further downstream, and indicators of clean waters are replaced by more pollution-tolerant species such as worms (*Annelidae*)¹⁰. The ecological appraisal for the flood defence works reports that *Octhebius exsculptus*, a notable B aquatic invertebrate species that lives in river banks was recorded by SEPA from the river in 1994⁹.

Fish

Details of the fish species recorded from the river are contained in the [fisheries](#) topic paper.

²⁵ Mark Hamilton Landscape Services, 2005

²⁶ Edinburgh & Lothians Green Space Trust, 2007

²⁷ JDC Ecology, 2002a & JDC Ecology. 2002b.

²⁸ Arup, 2003a

²⁹ da Prato, 1984

Amphibians & Reptiles

There are occasional records for toad (*Bufo bufo*), and a single record for a “newt” in 2008 (no species mentioned), which are held by the Water of Leith Conservation Trust.

Birds

A description of the bird populations along the Water of Leith was provided in “*The Water of Leith*”³⁰, and surveys of non-breeding birds were conducted as part of the flood defence works³¹. The Water of Leith Conservation Trust also holds bird data collected over a number of years.

Species such as dipper (*Cinclus cinclus*) and grey wagtail (*Motacilla cinerea*) are associated with shallow areas of clear water with pebble substrates and have been recorded from various locations along the length of the river. A number of species of waterfowl are also present including Mallard (*Anas platyrhynchos*). The Young Ornithologists Club undertook waterfowl surveys of the river in 1973, 1978, and 1983 and reported a decline in moorhen numbers, which was thought to be due to an increase in mink (*Neovision vision*) populations³², although they are still present along the river³³.

Mute swans (*Cygnus olor*) nest on the river, and grey heron (*Ardea cinerea*) use particular stretches for feeding (e.g. upstream of St. Mark’s Bridge). The kingfisher (*Alcedo atthis*) is one of the most notable species found on the river, which is believed to nest at a number of locations.

The presence of trees and woodland along most of the length of the river means that a variety of woodland birds may be seen including blue tit (*Cyanistes caeruleus*), long-tailed tit (*Aegithalos caudatus*), blackbird (*Turdus merula*), and wren (*Troglodytes troglodytes*) and these areas are considered important for birds³⁴.

Several bird of prey species are also seen along the river including Common buzzard (*Buteo buteo*), sparrowhawk (*Accipiter nisus*) and kestrel (*Falco tinnunculus*).

Mammals

Whilst there has been no comprehensive survey of mammals along the river, there are records for a number of species.

Otter (*Lutra lutra*) were surveyed as part of the ecological works to inform the flood defence scheme³¹. Signs of otter were recorded from most sections of the river between Balerno and Leith. No holts or couches were found, although suitable habitat to support them was identified. The Water of Leith Conservation Trust also keeps records of otter sightings and there are records from various locations along the river since at least 2005.

Mink are also found throughout the length of the river, and have been recorded in every year except 2008³³. The surveys undertaken to inform the flood defence works assessed signs of mink to be present at a similar level as those of otter³¹. Mink are known to have adverse interactions with native species, and there is anecdotal information that they may be impacting on waterfowl populations, but there is no empirical evidence to justify this for the Water of Leith.

³⁰ Porteous, 1984

³¹ JDC, 2002a

³² Edwards-Jones, 1993

³³ Water of Leith Conservation Trust, unpublished data

³⁴ Arup, 2003a

Badgers (*Meles meles*) have been recorded along the Balerno to Currie stretch³⁵, near the by-pass³⁶, Colinton, Redhall Braes and the Visitor Centre¹⁴ and there are also possible records of badgers further downstream near the Gallery of Modern Art¹⁶. However, the surveys undertaken to inform the flood defence works concluded that there was limited opportunity for badger given the highly urbanised character of the Water of Leith in the areas to be affected by the works, and although signs of badger activity were looked for, none were recorded³⁷.

Roe deer (*Capreolus capreolus*) are recorded regularly from Lanark Road upstream³⁸.

Grey squirrels (*Sciurus carolinensis*) are present along the river, and there are records for at least one albino grey squirrel from Colinton & Criaglockhart Dell¹⁹.

Stoats (*Mustela erminea*) have been recorded from around the Visitor Centre area¹⁹.

Brown rats (*Rattus norvegicus*) and foxes (*Vulpes vulpes*) are likely to be present along the full length of the river³⁹.

Common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Daubenton's bats (*Myotis daubentoni*) were located foraging along the watercourse during survey work to inform the flood defence works. No roosts were found at any stretch either in trees, bridges or buildings, although suitable habitat exists⁴⁰. A number of bat boxes have also been installed at various locations.

Vascular plants, fungi and bryophytes

Scott⁴¹ notes that the flora of the river valley was under-recorded in the early 1980s. Several introduced species are present, many of which have escaped from gardens. Some of these species are considered nuisance species (e.g. Giant Hogweed, *Heracleum mantegazzianum*) (see [below](#)). A greater number of alien species can be found closer to the Docks, which have been brought into the docks with grain shipments²².

Above the reservoirs, Bavelaw Marsh, part of Bavelaw Common SSSI, supports three nationally vulnerable or endangered bryophyte (moss) species and one red data book bryophyte species⁴². There are also records for a further 7 bryophyte species that are nationally scarce. The site is ecologically diverse and supports bryophyte communities typical of heath, raised bog, mire, fen and carr. The most significant community occurs in an area that is flooded most years and only periodically exposed²³.

The Water of Leith Conservation Trust has recorded around 250 vascular plant species and a further 34 tree and shrub species associated with the river.

There are relatively few "true" river plants, but three species of water crowfoot have been recorded, including stream water crowfoot (*Ranunculus penicillatus* subsp. *Pseudofluitans*), a local Biodiversity Action Plan (BAP) listed species. Owing to the difficulty in identification of

³⁵ S. Sweetman, SNH *pers comm*

³⁶ J. Hargreaves, CEC Ranger Service *pers comm*

³⁷ JDC, 2002a

³⁸ Water of Leith Conservation Trust, unpublished data

³⁹ Farquharson, 1984

⁴⁰ JDC, 2002a

⁴¹ Scott, 1984

⁴² Chamberlain, 2003

water crowfoot subspecies, the presence of either subspecies is considered to be of local BAP status.⁴³

The fungi of the river valley were described in “*The Water of Leith*”⁴⁴.

Invasive species

Japanese knotweed (*Reynoutria japonica*), Giant Hogweed and Himalayan Balsam (*Impatiens glandulifera*) all occur along the Water of Leith. The location of these species was noted in the ecological work undertaken for the flood defence works⁴⁵, and a special survey for Japanese knotweed was also conducted⁴⁶.

Management of invasive species has been summarised by the Edinburgh LBAP⁴⁷. In Edinburgh, control of invasive species has mainly focused on giant hogweed, Japanese knotweed and Himalayan balsam. Treatment has mainly been on land owned by the City of Edinburgh Council, or carried out as part of preparations for the flood prevention scheme. Millennium funding was secured for treatment of the Water of Leith corridor, which was carried out over a four year period. Some work has been carried out by volunteers on the Water of Leith to remove Himalayan balsam by hand.

Monitoring work conducted in 2008, as part of the flood prevention works⁴⁸, identified Himalayan balsam as the main invasive species along the river. The only locations for giant hogweed were near Warriston Viaduct, although it was noted that it was present on the Murrayburn. Japanese knotweed was present at more locations. The prevalence of Himalayan balsam is confirmed by surveys of invasive species co-ordinated on behalf of the Water of Leith Conservation Trust.⁴⁹ Giant hogweed was recorded at 30 locations, and Japanese knotweed at 6 locations.

The IEAP⁵⁰ identified another introduced species, rhododendron (*Rhododendron ponticum*), as beginning to colonise woodlands along the river, and an action to monitor and remove the species was included. Whilst the species is still present along the river (together with other terrestrial invasive species such as salmonberry, *Rubus spectabilis*), its current status and the threat that it poses to semi-natural habitats is unclear.

Designations

Balerno Common Site of Special Scientific Interest (SSSI) lies adjacent to Harlaw Reservoir, which is the source of the Bavelaw Burn. It has been selected for its assemblage of bryophytes, standing water, bog and fen and marsh communities.

Part of the western shore of Harperrig reservoir is a proposed Local Nature Reserve, principally due to the use of the reservoir margins by over-wintering wildfowl and waders. A small island (Gull Island) provides nesting areas for gulls and ducks. The freshwater habitat is scarce in the Lothians, with this being one of only 4 sites to record the Stonefly species *Leuctra nigra*. Otter are also present in the marshy grassland area where the Water of Leith enters the reservoir⁵¹.

⁴³ Arup, 2003a

⁴⁴ Watling, 1984

⁴⁵ JDC, 2002a

⁴⁶ Arup, 2002

⁴⁷ CEC, 2010

⁴⁸ Carroll, 2008

⁴⁹ Sommerville, 2009

⁵⁰ Edwards- Jones, 1993

⁵¹ West Lothian Council, *et al*, 2009

Areas considered of local importance for biodiversity have been designated as Local Biodiversity Sites (LBS). These form a network of semi-natural habitats spanning the city and rural areas and replaced Sites of Nature Conservation Importance (SINCs) within the City. Local Biodiversity Sites are grouped together with Local Geodiversity Sites under the umbrella term: Local Nature Conservation Sites (LNCS).

There are three LBS designated along, or adjacent to, the river: the Water of Leith as it runs through the City, Colinton Dell, and the rural Water of Leith. Other sites, such as Warriston Cemetery also occur in close proximity to the River (See Environmental Assets Figure).

The Water of Leith LBS extends for a total length of 11.4 kilometres from the crossing of the Union Canal to the Firth of Forth at Leith Docks. The site includes the river, fringing woodland, waste ground and grassland with a few locally rare plants, insects, mammals and birds. The most extensive habitat is woodland, mostly semi-natural native woodland but with areas of plantation which fringe parts of the river particularly when the valley is deep and steep. The Notable Plant species include the woodland Hart's-tongue fern (*Phyllitis scolopendrium*) and Aspen (*Populus tremula*), the ruderal Squirrel-tail Fescue grass (*Vulpia bromoides*) and Common Mallow (*Malva sylvestris*), and the wetland Water-cress (*Rorippa nasturtium-aquaticum*). Notable Animal species include a wetland water beetle (*Ochthebius exsculptus*), a woodland micro-moth (*Psychoides exsculptus*), Kingfisher, Song Thrush (*Turdus philomelos*), Bullfinch (*Pyrrhula pyrrhula*) and Otter. The site continues to the south-west as The Dells LBS and adjoins the Disused Railway Network LBS, Warriston Cemetery LBS and the Union Canal LBS.

The Dells LBS covers a length of the Water of Leith and continues to the south-west as Water of Leith and Tributaries (Rural) LBS and to the north-east as The Water of Leith LBS. The site comprises the river, native woodland and patches of amenity grassland with a few locally rare plants, insects and mammals. The most extensive habitat is woodland, mostly semi-natural broadleaved but with small plantation areas and scrub in places, but there are three extensive areas of ancient woodland. There are scattered areas of grassland along the site the majority of it managed as amenity grassland. The Notable Species recorded to date include a wetland moss (*Fissidens pusillus*), woodland Hart's-tongue Fern (*Phyllitis scolopendrium*), a fungus beetle (*Leiodes rugosa*) and several active badger setts.

Otter and all species of bat are listed on Annexes II and IV of the Habitats Directive, which give the species protection at a European level. Otters and bats are priority species in the UK Biodiversity Action Plan (UKBAP), and are listed on the Scottish Biodiversity List of priority species.

The ecological appraisal for the flood defence works recorded three species listed at that time in the Edinburgh Local Biodiversity Action Plan: floating water crowfoot, meadow crane's-bill and bluebell.⁵² Since that assessment was undertaken, the Local Biodiversity Action Plan has been updated (see below).

Edinburgh Local Biodiversity Action Plan (LBAP)

Edinburgh's first LBAP was published in 2000 (see below), with a second document published in 2004. The LBAPs are produced by the Edinburgh Biodiversity Partnership (EBP), which is a working group of organisations drawn from public bodies, the commercial and voluntary sectors, research, education and amenity groups.

⁵² Arup, 2003a

The LBAP has acted as the focus for habitat and species management in the City. Achievements along the Water of Leith include: habitat and river improvement work at Bonnington; creation of a wildlife garden at the start of the walkway at Balerno; access improvements and wildflower planting on the Slateford section; and confirmed record of breeding female otter and capturing footage of an otter near the Water of Leith Visitor Centre⁵³.

5.2 Current management initiatives

Local Biodiversity Action Plan

The Edinburgh Local Biodiversity Action Plan (LBAP) was first published in 2000, as an initiative to conserve and enhance Edinburgh's natural heritage. Since then the Edinburgh Biodiversity Partnership, lead by the City of Edinburgh Council, have worked to protect species and habitats in Edinburgh.

The third Edinburgh Biodiversity Action Plan (2010-2015) was launched on March 19th 2010. The new plan continues with a focus on habitat maintenance, restoration and enhancement, delivered by six broad Habitat Action Plans. These plans aim to improve existing habitats and create new links to form green networks across the city. There are also twelve Species Action Plans, including a new plan for bees. Work is ongoing to identify other species which may require attention, based on the long list of priority 'notable' species for Edinburgh⁵⁴.

A separate action plan to address issues related to invasive non native species has also been produced. (see [below](#)).

Habitats

The organisation of habitats within Habitat Action Plans (HAPs) has been re-organised to reflect the working groups of the Scottish Biodiversity Group. The Water of Leith is covered by the freshwater and wetland HAP, although the remaining plans also have relevance to habitats through which the river flows⁵⁵.

The freshwater and wetland HAP aims to maintain the biological diversity of Edinburgh's rivers, canals, lochs, ponds and other freshwater habitat; and to help deliver the requirements of the Water Framework Directive by helping to achieve good ecological status of Edinburgh's wetland habitats³². Further details of the Water Framework Directive are provided in the [Water](#) Topic paper. The plan is also seen as a mechanism for ensuring that mitigation and restoration work required as part of the flood defence scheme is carried out.

The plan identifies habitat features that should be maintained or created to maximise the ecological value of watercourses. These are the retention of a buffer of uncut vegetation (at least 2m wide) next to the watercourse, ensuring continuous bank side habitat, riparian strips and aquatic vegetation³². Some of these features are currently present along the Water of Leith (e.g. extensive riparian strips), and need to be retained. Other features, such as aquatic vegetation, could be enhanced.

Nineteen activities that form core duties of Edinburgh Biodiversity Partnership organisations are identified by the HAP. Some of these apply to all freshwater and wetland sites (e.g.

⁵³ CEC, 2010

⁵⁴ CEC, 2010

⁵⁵ The other HAPs cover woodland, farmland, lowland & urban, uplands, marine & coastal

monitor ecological status of Edinburgh's main watercourses; monitor known kingfisher breeding sites and record all sightings), whilst some are specific to particular locations or water courses. Three ongoing actions are specific to the Water of Leith:

- Hold awareness raising events relating to the Water of Leith.
- Provide a focus for the encouragement of community and volunteer participant in the practical improvement of the Water of Leith.
- Promote the effective management of the Water of Leith river valley.

New actions, for which funding has been approved, are:

- FW01 Ensure monitoring of habitat restoration works associated with the Water of Leith and Braid Burn flood prevention schemes is carried out.
- FW02 Once flood prevention scheme is complete undertake monitoring of fish and invertebrates on the Water of Leith and repeat the following year to chart species recovery.
- FW03 Continue with programme of control and monitoring of target invasive plant species along Water of Leith and Braid Burn, associated with flood prevention works.
- FW04 Produce a management plan for the Water of Leith.
- FW05 Encourage volunteer teams to survey the locations of non-native plant species and undertake control work as required, in areas upstream of Slateford not covered by flood prevention works.
- FW07 Annual community habitat project to be carried out on Water of Leith.

Seven additional actions are also identified by the plan, but funding has not been secured for these. Whilst some of these would apply to the Water of Leith (e.g. identify opportunities for riparian woodland creation or enhancement), none of them are specific to the river.

One action specific to the Water of Leith is included in the woodland HAP:

- WD09 Ensure monitoring of the impact of the Water of Leith and Braid Burn flood prevention works on bank side trees and other wetland vegetation is implemented.

Species

Actions for species are generally included within the relevant HAP. For example, there are ongoing actions to assess the distribution of fish species on watercourses at regular intervals and to monitor known kingfisher breeding sites. Separate Species Action Plans (SAPs) have been prepared for those species that require special attention, which are not covered by the HAPs. Badgers, bats (common pipistrelle, soprano pipistrelle and Daubenton's) and otter are covered by these plans. Many of the specified actions relate to implementation of existing protective legislation, awareness raising and habitat management.

One action that has particular relevance to the Water of Leith is the aspiration to carry out a survey of waterways for the presence of Daubenton's bat, although funding has not yet been secured for this.

All actions relating to otter are also relevant to the Water of Leith. Six ongoing actions are included in the SAP, which relate to information gathering, habitat management, training and raising awareness.

Invasive species

The Edinburgh LBAP includes a separate action plan to address invasive species. Actions are linked to identifying the location of species, and controlling them and there is a commitment to continue survey and treatment of giant hogweed, Japanese knotweed and Himalayan balsam in association with flood prevention schemes on the Water of Leith. The use of chemical control methods is to be reviewed, particularly where this may cause conflict with other wildlife. The plan notes that there is no single co-ordinated approach to managing invasive species, and this is included as an aspiration for funding.

Flood defence works

Background information about the flood defence works is provided in the [Water](#) Topic paper. Detailed ecological appraisals of the impacts of the scheme at different locations have been prepared⁵⁶. The main issues for biodiversity are to maintain water quality, minimise disturbance to the channel and bank sides where these retain or are forming more natural features, and minimise vegetation removal along the watercourse⁵⁷. Mitigation measures include minimising the footprint of construction works; reinstating habitats through planting; planting water-loving, indigenous species of plants along the riverbanks; providing additional bat and bird roosts in appropriate areas; and sensitive programming of construction operations. These mitigation measures have been explained in more detail, for each location affected by the works, in Environmental Action Plans for the main stem of the river⁵⁸ and the reservoirs⁵⁹.

The main issue at Harlaw and Threipmuir Reservoirs is to maintain adequate water levels at Bavelaw Common SSSI, which has been achieved through construction of new weirs. At Harperrig, mitigation was required to ensure that the island used for bird-breeding remained separated from the main shore to prevent predator access, which has been achieved through dredging the channel.

Water Framework Directive

Under the terms of this Directive, there is a requirement to manage rivers to achieve either Good ecological status or Good ecological potential. Programmes of work to ensure that the Water of Leith meets these targets are being developed by the Scottish Environment Protection Agency. Further details of the requirements of the Directive and how it will influence the management of the Water of Leith are provided in the [Water](#) topic paper.

Other management plans

Pentland Hills Regional Park

The upper reaches of the Water of Leith, including Harperrig, Harlaw and Threipmuir Reservoirs lie within the Pentland Hills Regional Park. A ten-year management plan for the park was introduced in 2007⁶⁰. The plan has a number of themes. Theme C considers conservation and enhancement of the landscape, natural and cultural heritage of the hills. The plan includes actions to safeguard the special character of the area, to promote responsible recreational use of water resources, and to investigate hydro-electric generation options. Harlaw and Threipmuir reservoirs are key sites within the Park and the Park Authority facilitates the Bavelaw Common SSSI management group.

⁵⁶ Arup, 2003a

⁵⁷ Arup, 2003b

⁵⁸ Arup, 2006a

⁵⁹ Arup, 2006b

⁶⁰ Scott Wilson, 2007

Harperrig LNR Management Plan

A management plan has recently been completed for this site⁶¹. It has six aims related to increasing woodland cover, to enhance habitats and species, to provide habitats for birds, to improve access and interpretation and to monitor the success of the plan.

Poet's Glen management plan

Poets Glen is a locally derived name for the Kinleith Burn and the valley formed by the burn, which lies in Currie. It comprises an area of valley woodland, which forms a narrow strip along the valley of the Kinleith Burn. The southern edge of the woodland meets with Kinleith Road, and to the north the woodland extends to the Blinkbonny Road. The woodland sits on the edge of the Pentland Hills Regional Park, with Blinkbonny Road forming the Park's northern boundary.

A five-year Management Plan was developed in 2007 and 2012⁶². This divides the woodland into a number of management compartments, and detailed prescriptions (e.g. relating to thinning, re-planting etc.) are produced for each.

Craiglockhart and Colinton Dells management plan

A five-year management plan for the woodland was produced in 2005, to cover the period to 2010⁶³.

Wildflower planting

The Water of Leith Conservation Trust, funded by Scottish Natural Heritage, organised wildflower planting near Bells' Mill in 2009. Over 500 wildflower plugs were planted, and over a kilo of seed was scattered. Species planted include; Giant Bellflower (*Campanula latifolia*), Oxeye Daisy (*Leucanthemum vulgare*), Purple Loosestrife (*Lythrum salicaria*), St Johns Wort (*Hypericum perforatum*), Hawkweed (*Hieracium* sp.), and Cowslip (*Primula veris*). Within the seed mix were; poppy (*Papaver somniferum*), cornflower (*Centaurea cyanus*), corn marigold (*Chrysanthemum segetum*), yellow rattle (*Rhinanthus minor*), yarrow (*Achillea millefolium*), Knapweed (*Centaurea nigra*), Birds Foot trefoil (*Lotus corniculatus*), buttercup (*Ranunculus* sp.), and scabious (unknown species) among others. The aim of the planting programme was to improve the habitat of the grassland in that area, and provide a focus for volunteer action. More projects are being planned for the future.

Edinburgh Woodland Strategy & woodland survey

The City of Edinburgh Council Forest Service was established in June 2009. A survey of trees and woodlands on Council-owned land was undertaken the same year. The survey was commissioned on a department by department basis, which means that not all Council land was covered by the survey. For example, land belonging to the City Development Department has not yet been assessed. The survey collected various data, and made an assessment of the need to carry out essential maintenance for health and safety reasons. These data are stored on the Ezytreev database, which now holds information for 35,000 trees in Edinburgh, including substantial numbers along the Water of Leith⁶⁴.

Work is underway to prepare a new Woodland Strategy for Edinburgh to replace the earlier 'Urban Forestry Strategy', which was completed in December 1991. The vision is that Edinburgh's woodlands and trees resource should be diverse in structure, be able to meet the

⁶¹ West Lothian Council, *et al.*, 2009

⁶² Edinburgh & Lothians Green Space Trust, 2007

⁶³ Mark Hamilton Landscape Services, 2005

⁶⁴ City of Edinburgh Forest Service *pers comm*

changing conditions of our environment, and are protected and managed to deliver multiple benefits⁶⁵. Six themes are proposed to deliver the strategy: climate change; access and health; supporting the community; environment and biodiversity; business development; and woodland and tree management. Actions to implement the strategy are still in preparation, but may include control programmes for grey squirrel and roe deer.

The Edinburgh and Lothians Forest Habitat Network Partnership is a joint initiative between Forestry Commission Scotland, Scottish Natural Heritage, City of Edinburgh Council, Midlothian Council, East Lothian Council, West Lothian Council, Edinburgh and Lothians Greenspace Trust, Central Scotland Forest Trust, and Woodland Trust Scotland. The Partnership was established in 2008 to provide a more co-ordinated approach to the development of forestry throughout the Region, to embrace the concept of habitat networks and to promote the associated social and ecological benefits that these can provide. The strategic objectives of the Partnership will be set out in a regional forestry framework which will determine the direction for Forestry policy within the Edinburgh and the Lothians Region over the next 40 years⁶⁶. An audit of woodland has been completed, and habitats along the Water of Leith have been included within this⁶⁷.

Saughton Prison

There is a proposed scheme for the inmates at the prison to construct bird and bat boxes, which would be distributed to the CEC Countryside Ranger Service and Water of Leith Conservation Trust to be placed in the Water of Leith Valley.

5.3 Objectives and actions

Aims and objectives: *To safeguard and enhance the biodiversity associated with the Water of Leith.*

Specific objectives for biodiversity are:

- Maintain and enhance the biodiversity quality of the Water of Leith.
- To implement actions specific to the Water of Leith that are included in the Edinburgh LBAP, 2010 – 2015.
- To raise awareness of the biodiversity quality of the river.
- To involve the public in monitoring and managing the biodiversity interest of the river.
- To limit the spread (and remove where possible) invasive plant species.

Rationale: The existing biodiversity value of the river corridor has been recognised through its designation as a LBS. Although it is an urban river, there are lengths that are relatively unmodified, and in addition to supporting protected species, the river corridor enables passage of wildlife through the city from the hills to the sea, and between other open spaces in the City. Protected and iconic species such as kingfisher and otter can be seen in the middle of Scotland's Capital City, although many people may be unaware of this fact.

Much of the value of the riparian corridor is linked to woodland and single trees. This value could be enhanced through appropriate management. There are also large areas of amenity grassland, which have the potential for habitat enhancement measures. Whilst there are a number of habitat management initiatives under way, these are focussed either at the city level (e.g. management of woodlands through the Edinburgh Woodland Strategy), or at the site level (e.g. management of land in Saughton Park). There have been community-based

⁶⁵ City of Edinburgh Forest Service, *in prep.*

⁶⁶ http://www.elfhnp.org.uk/publications/elfhnp_introductory_leaflet.pdf

⁶⁷ Hamilton & McPhillimy, 2008

projects for habitat enhancement organised between the Water of Leith Conservation Trust and the Countryside Ranger Service (e.g. planting of wildflowers at Belford Weir), which, whilst valuable, are *ad hoc* projects rather than part of a clear programme of habitat improvement works along the river. What is missing is a clear, detailed, ecological management plan, that identifies objectives and detailed management prescriptions for each length of the river.

Water quality is already fairly good, and likely to improve further as a result of actions under the Water Framework Directive. This Directive will also act as a driver for other ecological improvements in the river (see [Water](#) Topic paper).

The river faces some major challenges over the next few years. The installation of flood defence works at various locations will create short-term disturbances to habitats and species and a comprehensive Environmental Action Plan has been prepared, which will need to be implemented in full to minimise the long-term effects of the scheme. There could be other major changes too, such as the introduction of micro-hydro schemes.

The Edinburgh LBAP includes an action (FW04) to produce a management plan for the Water of Leith. This document fulfils that action.

Actions to maintain and enhance the biodiversity associated with the Water of Leith. (Lead Agencies are shown in bold) Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A48).

Action	Lead Agency & partners ⁶⁸	Targets
B1: Develop and implement an ecological management plan, which should include: <ul style="list-style-type: none"> • Identification of ecological management compartments along the river valley (to be conducted in conjunction with the survey of woodland along the river that has been conducted); • Identification of areas where there is the potential for habitat enhancement/creation or the restoration of habitat links; • Production of detailed ecological objectives and prescriptions for each management compartment⁶⁹. 	WoLCT, CEC CRS, CEC Forestry Service CEC City Development	a) Identification of management compartments. b) Identification of areas with potential for habitat enhancement. c) Production of ecological objectives and prescriptions.

⁶⁸ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage

⁶⁹ This would need to interact with the Edinburgh Woodland Strategy, and the Environmental Action Plan for the flood defence works. It would provide the context for planning community based projects e.g. locations for wildflower planting, removal of invasive species, placing of bat boxes etc. It would also act as a mechanism to identify areas of land adjacent to the river, which are not in Council ownership, but where management arrangements with adjacent land owners should be established as a matter of priority. It should include details of locations suitable for habitat enhancement and provide detailed prescriptions to achieve this e.g. species mixes to use, methods of establishment, cutting frequency etc.

Action	Lead Agency & partners ⁶⁸	Targets
The principle of establishing continuous riparian vegetation is likely to underpin all objectives and prescriptions (A48).		
B2: Implement actions specific to the Water of Leith that are included in the Edinburgh LBAP, 2010 - 2015 ⁷⁰ (A6)	Various organisations	Targets included in LBAP.
B3: Ensure monitoring of habitat restoration works associated with the Water of Leith flood prevention schemes is carried out (A29).	CEC City Development - Structures and Flooding & Natural Heritage , SEPA, WoLCT	Once the flood prevention works are complete ensure the Environmental Action Plan is implemented.
B4: Once flood prevention scheme is complete undertake monitoring of fish and invertebrates on the Water of Leith and repeat the following year to chart species recovery (A29).	CEC City Development – Structures and Flooding . Honorary Bailiffs.	Carry out 2 surveys of invertebrates and fish, following flood prevention works.
B5: To include details of the biodiversity quality of the river in written interpretive material produced for the river (A30, A42, A69).	WoLCT , CEC CRS, CEC Parks & Green Space, PHRPRS	Inclusion of information on biodiversity in all new interpretation materials produced.
B6: Prepare an audio wildlife trail for the river. (A40)	WoLCT , Possible student project	Production of audio trail that can be downloaded from website.
B7: To continue a programme of educational events linked to the biodiversity interest of the river. (A10, A11)	WoLCT, CEC CRS	Targets to be set annually in WoLCT business plan and CEC CRS work programme.
B8: Develop a system of collaborative working to enable sharing of digital data between different agencies and Council Departments involved in managing the Water of Leith (e.g. through the creation of a single GIS system or use of the Parks Asset Database Management System (ADMS)) (A35).	CEC all relevant departments, WoLCT , SEPA, SNH	a) Creation of data sharing protocol. b) Discussion of data sharing issues at stakeholder meetings.
B9: Annual community habitat project to be carried out on Water of Leith (A8).	WoLCT	Targets to be set on annual basis through WoLCT Business Plan & CEC CRS work plan, but aim for annual project.
B10: Continue with programme of control and monitoring of target invasive plant species along Water of Leith associated with flood prevention works (A20).	CEC Structures & Flooding , CEC CRS (N.B. Structures & Flooding will only have an involvement with this action up to and during implementation of the flood defence works)	Survey and undertake control work annually on both watercourses.
B11: Use volunteers to undertake control of Himalayan Balsam (A20).	WoLCT, CEC CRS , Honorary Bailiffs	a) Survey locations of non native invasive plant species,

⁷⁰ Only those actions specific to the Water of Leith are included in this table. Actions have been amended to exclude references to other water courses. The numbers in brackets refer to the Action number in the Edinburgh LBAP. Actions relating to invasive species have been included under objective B5.

Action	Lead Agency & partners ⁶⁸	Targets
		using volunteers. b) Co-ordinate practical action to tackle the spread of non native invasive plants.
B12: Establish a co-ordinated framework for the management of invasive species (A77).	CEC (Various Departments)	a) Formation of steering group. b) Development of strategy.
B13: Digitise biodiversity data collected by the Water of Leith Conservation Trust. Digitisation should enable easy sharing of data by relevant bodies (e.g. CEC CRS are using Recorder 6, and data should be shared with Lothian Wildlife Information Centre & NBN Gateway) (A68).	WoLCT Opportunity for volunteer involvement	All data sets digitised.
B14: To encourage the involvement by Saughton Prison in supporting biodiversity initiatives along the river e.g. construction of bird and bat boxes. (A34)	CEC CRS, WoLCT, Saughton Prison Authorities	Construction and installation of bat and bird boxes.
B15: To assess the scale and impact of mink populations along the Water of Leith. (A57)	WoLCT, CEC CRS, CEC City Development Opportunity for volunteer involvement/ student project.	Complete survey and assessment of mink populations.

REFERENCES

Arup, 2002. Japanese knotweed survey findings and management options report. Report to City of Edinburgh Council

Arup, 2003a. Water of Leith Flood Prevention Scheme: Environmental Statement, Volumes 1 – 3. Report to City of Edinburgh Council

Arup, 2003b. Water of Leith Flood prevention scheme, Environmental Statement, Non-Technical Summary, City of Edinburgh Council

Arup, 2006a. Water of Leith Flood Prevention Scheme, Environmental Action Plan. City of Edinburgh Council.

Arup, 2006b. Water of Leith Flood Prevention Scheme, West Lothian Council Environmental Action Plan. City of Edinburgh Council

Carroll, S. 2008. Reports of Invasive Species Control on the Water of Leith. Various Dates. Included with letters to City of Edinburgh Council, City Development (Bridges and Structures).

Chamberlain, D. F. 2003. Bavelaw and Balerno Common SSSI – A Bryophyte Assessment. Produced for Water of Leith Flood Defence Scheme, City of Edinburgh Council

City of Edinburgh Council. 2010. Edinburgh Local Biodiversity Action Plan Phase 3.

City of Edinburgh Forest Service, *in prep*. Draft Woodland strategy Feb 10

da Prato, S. 1984. Fish and Invertebrates in the Water of Leith. Chapter in *The Water of Leith* Ed S Jamieson, Water of Leith Project Group.

Edinburgh & Lothians Green Space Trust. 2007. Poets Glen Wood Currie Woodland Management Plan May 2007

Edwards – Jones, E. 1993. The Water of Leith Integrated Environmental Action Plan. Scottish Wildlife Trust, Edinburgh

Farquharson, E. 1984. Water of Leith Mammals. Chapter in *The Water of Leith*. Ed. S. Jamieson. The Water of Leith Project Group, Edinburgh

Mark Hamilton Landscape Services. 2005. Colinton Dell Final Draft Woodland Management Plan. Prepared for CEC Department of Culture and Leisure.

Mark Hamilton Landscape Services & Donald McPhillimy Associates. 2008. Edinburgh & the Lothians Forest Habitat Network Partnership Forestry Framework Status Report. For Edinburgh and Lothians Forest Habitat Network Partnership

Heritage Environmental. 2001. Phase 1 Habitat Survey of the Water of Leith and Braid Burn. A report for City of Edinburgh Council. CEC Edinburgh

Jamieson, S. 1984. The Water of Leith. The Water of Leith Project Group, Edinburgh.

JDC Ecology. 2002a. Water of Leith Flood Alleviation Scheme Baseline Ecological Survey. Unpublished report to City of Edinburgh Council

JDC Ecology. 2002b. Water of Leith Rural, Harperrigg to Slateford River Habitat Survey

Porteus, M. 1984. The Birds of the Water of Leith. Chapter in *The Water of Leith*. Ed. S. Jamieson. The Water of Leith Project Group, Edinburgh

Scott, M. M. 1984. The Flora of the Water of Leith Valley. Chapter in *The Water of Leith*. Ed. S. Jamieson. The Water of Leith Project Group, Edinburgh

Scott Wilson. 2007. Pentland Hills Regional Park Plan (2007-2017) Draft Executive Summary - September 2007

Sommerville, F. 2009. Invasive Plant Species Report for the Water of Leith 2008 – 2009.

Watling, R. 1984. Fungi. Chapter in *The Water of Leith*. Ed. S. Jamieson. The Water of Leith Project Group, Edinburgh

West Lothian Council, SNH, Pentland Hills Ranger Service, 2009. Harperrigg local nature reserve management plan. West Lothian Council.

6 FISHERIES

This topic paper reviews issues related to fish populations in the Water of Leith and focuses upon recreational fish stocks. Ecological aspects of river management are dealt with in more detail in the [biodiversity](#), habitats and species management topic paper.

6.1 Historical Context/Current situation

Fish Fauna

Up to fourteen species have been recorded as present along the Water of Leith. The Environmental Statement produced to support the flood defence works summarised the distribution of each species⁷¹ along the river, and an abbreviated version of this table is presented as Table 6.1. Nine of these species (species groups) were recorded during surveys in 2009: brown trout (*Salmo trutta*), Atlantic salmon (*Salmon salar*), bullhead (*Cottus gobio*), European eel (*Anguilla anguilla*), lampreys (various species), minnow (*Phoxinus phoxinus*), three-spined stickleback (*Gasterosteus aculeatus*), grayling (*Thymallus thymallus*) and stone loach (*Nemacheilus barbatus*). Sea trout have also been recorded near Redbraes Weir⁷².

Brown trout are the most widespread species; they were recorded from all 12 sampling sites⁷³ assessed by the Clyde River Foundation in 2009; and were recorded from all ten sampling sites assessed by the Forth Fisheries Foundation (FFF) in 2003⁷⁴. The FFF survey recorded trout fry and parr, indicating that natural spawning occurs, and this was confirmed by the 2009 survey work which found young fry along the length of the river⁷⁵. Trout spawning in the Water of Leith commences in September until October, with hatching occurring from the start of February until end of March⁷⁶.

The identity of the lamprey species is unclear as most surveys have recorded mainly juvenile lampreys (ammocoetes), which are difficult to identify to species and have different habitat requirements to those of the adult lamprey. The species most likely to occur on the Water of Leith are River and Brook lamprey⁷⁷.

Bullhead and grayling are both species that are thought to be recent introductions to the Water of Leith. Bullhead was introduced to Scotland in the early 20th Century⁷⁸, whilst grayling were also introduced in the last approx. 150 years. Grayling stocks in the Water of Leith are thought to have been introduced from the Esk⁷⁹.

Although bullhead is a recent introduction to the river, it has colonised significant lengths of the river and is present at high numbers. By 2003 the Forth Fisheries Foundation⁸⁰

⁷¹ Arup, 2003

⁷² Priestly, 1996

⁷³ 240m downstream of Bonnington Bridge; Bonnington; Tanfield footbridge; Edinburgh Sports Club; Murrayfield; Balgreen; Fords Road; Stenhouse Industrial Estate; upstream of Stenhouse Industrial Estate; upstream of Bogs Bridge; Spylaw Park Colinton; Juniper Green.

⁷⁴ Forth Fisheries Foundation, 2003

⁷⁵ Honorary Bailiffs report 2010

⁷⁶ J. Adams quoted in Arup, 2008

⁷⁷ Napier University, 2006

⁷⁸ Maitland, 1994

⁷⁹ F. Sommerville *pers comm*

⁸⁰ Forth Fisheries Foundation, 2003

considered that bullhead was expanding its range and was the most numerically dominant species recorded from four sites near Kinleith Mill in 2008⁸¹. It may also be displacing the native stone loach⁸², which was found at 12 locations along the river sampled in 2009⁸³.

The status of Atlantic salmon is unclear. Napier University (2006) stated that there is no evidence of salmon spawning in the Water of Leith, but the presence of salmon parr in some surveys⁸⁴ shows that some spawning takes place.

Table 6.1: Summary of fish species records and distribution along the Water of Leith (extracted from Arup, 2003)

Species	Comment on distribution
Eel	Moderate population numbers present throughout the river
Bullhead	Large numbers present in all parts of the river.
Pike	Occasional catch reports, possibly entering the watercourse from the Union Canal via Slateford sluice.
Three-spined stickleback	Whole length of river
River lamprey	Lower reaches of the river
Brook lamprey	Whole length of river top end
Stone loach	Whole length of river. Arup (2003) Suggested that bullhead may be displacing this species. Now thought to be extinct due to Bullhead (F. Sommerville & J. Hargreaves, <i>pers comm</i>).
Perch	Occasional catch reports, possibly entering the watercourse from the Union Canal via sluices at Slateford and near Wester Hailes
Minnow	Whole length of river
Flounder ⁸⁵	Migrate from the Forth. Upstream migration is halted by Dean weir.
Rainbow trout ⁸⁶	Occasional catches reported, possibly entering the watercourse from Harlaw reservoir via Bavelaw Burn
Brown trout	Whole length of river. Includes native populations and stocked fish. Sea trout also been recorded at Redbraes.
Salmon	Small numbers enter from the Forth. Upstream migration is halted by Dean weir.
Grayling	Large numbers present below Slateford, and a small number above.

The fish fauna includes several species that are migratory: European eel is a catadromous fish, that is, the adults spend their time in fresh water but return to the sea (the Sargasso Sea) to breed. The young or “glass” eels then return to fresh water. By contrast, Atlantic salmon are anadromous fish, which breed in fresh water but travel to the sea to grow and mature. Movement into and out of the Water of Leith is impeded by the dock gates at Leith, which act to impound the river. Passage through the gates is only possible when they are opened to allow ships through. Movement along the Water of Leith is also hampered by a series of weirs, relicts of the river’s industrial past. These act to divide the river into a number of compartments, and any salmon and sea trout that enter the river can only progress upstream as far as the Dean weir. Eel dispersal is less affected by weirs than salmon and trout, as they are able to migrate over land for short distances.

⁸¹ CRF, 2009

⁸² Arup, 2003

⁸³ Honorary Bailiffs report 2010

⁸⁴ CRF, 2009

⁸⁵ *Platichthys flesus*

⁸⁶ *Salmo gairdneri* / *Oncorhynchus mykiss*

Angling – Water of Leith

There is an active brown trout fishery on the Water of Leith, which is managed by a team of voluntary Honorary Bailiffs on behalf of the City of Edinburgh Council (Services for Communities). Currently there are 15 Bailiffs, who operate under the direction of the High Bailiff. The Bailiffs maintain a presence on the river bank, check and issue permits and assist with stocking and managing the fishery. Fishing is by permit only, which are available free of charge from a number of locations⁸⁷. It is a condition of the permit that catch returns are submitted at the end of the year. Annual reports of catches are published.

The season opens on 1st April and runs until 30th September. Fishing is permitted 7 days per week between Balerno and West Bowling Green Street, excluding private stretches. A bag limit of 2 trout is set, and all fish caught must be over 10” in size. Fishing is restricted to one rod per person, which must be hand held. Spinning and fixed line fishing is prohibited. Between Balerno to Bogs Bridge fly fishing only is permitted and only barbless hooks may be used. Fly or bait fishing is permitted between Bogs Bridge and Leith. Grayling can also be caught during the brown trout season. Salmon and sea trout fishing is not allowed.

The native brown trout are supplemented by an annual stocking programme (see below), and it is not clear the extent to which the two populations inter-breed.

Between 1990 and 2000 an average of 554 trout per year were caught (based on catch returns), although the catch increased in 2001 to 720 fish⁸⁸. 1265 permits were issued in 2009, from which 70 returns were received. The largest fish recorded in 2009 was 4lb, caught at Murrayfield⁸⁹.

Angling – Reservoirs

Angling occurs on Harperrig, Threipmuir and Harlaw Reservoirs.

Harperrig reservoir is one of the Lothian’s longest-established brown trout fisheries. It supports a wild brown trout fishery, which is supplemented by stocked fish in the range 1lb-1.5lb⁹⁰ and is managed by a Private Consortium. The City of Edinburgh Council also has fishing rights on the Reservoir, but does not exercise these⁹¹.

Fishing on Threipmuir and Harlaw Reservoirs is managed by the Mallyen Angling Association under a lease from Rosebery Estates and the Threipmuir Angling Association. Threipmuir supports a wild brown trout fishery and is also stocked throughout the year by the club with brown trout 12” to 14” in size by Mallyen Angling Club and fish of a similar size by the Threipmuir Angling Club. By contrast, Harlaw is stocked with rainbow trout of 1.5lb size during the season⁹².

The Forth Fisheries Foundation undertook a survey of the spawning and fish interest of Bavelaw Burn in 2003 to inform the Flood prevention works⁹³. This focussed on the burn upstream of Threipmuir Reservoir. It was concluded that the Burn exhibits the necessary

⁸⁷ Council offices at Waverley Court and Cockburn Street; Post Offices at Juniper Green, Currie, Balerno, Colinton; City of Edinburgh Council Countryside Ranger Service at the Hermitage of Braid; fishing tackle shops throughout the City; Water of Leith Conservation Trust Visitor Centre; River Bailiffs

⁸⁸ Arup, 2003

⁸⁹ Water of Leith Bailiff newsletter Winter 2010

⁹⁰ Harperrig Fisheries website

⁹¹ A. MacGregor *pers comm*

⁹² Mallyen Angling Club website

⁹³ Forth Fisheries Foundation, 2003

physical features to support spawning and nursery areas for trout and that adult fish can enter the burn from the Reservoir. The middle stretches were considered most suitable.

Surveys

Several surveys of fish populations in the Water of Leith have been undertaken over at least the last 16 years, some of which have been prompted by the need to inform the flood defence works (see [section 13.2](#)).

The Freshwater Fisheries Laboratory undertook fish surveys on the Water of Leith between 1994 and 2001. These surveys, which were instigated as an action arising from the IEAP⁹⁴, assessed the numbers and sizes of trout present up and down the river; the fate of stocked trout; the presence of grayling; and the presence of migratory fish in the lower river. An initial scoping survey was carried out in 1994 at two locations (Saughton and Balerno). Subsequent surveys assessed fish populations at these two locations and a third site downstream at Redbraes. The surveys confirmed the presence of a large population of trout, including individuals of impressive size for anglers. Stocked trout could represent up to 50% of the fish of takeable size (defined as 8 inches at that time), and so were important to anglers. However, stocked fish appeared to disappear rapidly from the stocking sites, and it was not known whether this was due to capture and removal by anglers, increased predation, death, or migration. Sea trout and finnock (sea trout making a first return to freshwater) were recorded at Redbraes. Grayling were also recorded as far upstream as Saughton, but were not considered to pose a threat to grayling. There was concern about the high incidence of cataracts on trout and grayling.⁹⁵

The Forth Fisheries Foundation surveyed the Water of Leith as part of a larger assessment of fish distribution in the Forth Catchment.⁹⁶ Eight species⁹⁷ were recorded including salmon, which were found at Leith and Stockbridge. Although the numbers of salmon caught were small (7), the surveyors found salmon parr and concluded that there is some natural salmon spawning activity in the Water of Leith and that adult fish are able to access the river in spite of the Leith dock gates.

Napier University have undertaken surveys at Balerno (2005, & 2006) and Saughton (2005, 2006 & 2009). Bullheads and brook lamprey were recorded at Saughton and Balerno in 2005 & 2006⁹⁸

The Clyde River Foundation undertook an assessment of the fish community near Kinleith Mill, Juniper Green in 2008⁹⁹, to inform a planning application. The survey focussed particularly on the presence of lampreys and bullhead. They recorded six species of fish from four locations: brown trout, bullhead, lampreys¹⁰⁰, eel, minnow and three-spined-stickleback. Trout and brook lamprey had been spawning in the vicinity of all the sampling sites. Trout densities were considered to be low, although the survey method may have underestimated true numbers. Barriers to upstream migration were noted at both ends of the sample reach, meaning that the maintenance of fish populations is reliant on new

⁹⁴ Edwards – Jones, 1993

⁹⁵ Priestly, 1996

⁹⁶ Forth Fisheries Foundation, 2003

⁹⁷ Salmon, trout, grayling, stone loach, bullhead, eel, minnow and 3-spined stickleback

⁹⁸ F. Sommerville, pers comm., unpublished data provided by Napier University, School of Life Sciences

⁹⁹ Yeomans *et al* 2008

¹⁰⁰ There are three species of lamprey that can occur: brook lamprey, river lamprey and sea lamprey. Immature brook and river lamprey (known as ammocoete) are difficult to differentiate

recruits being swept in from upstream, and use of the limited spawning habitat within the reach.

The Clyde River Foundation has undertaken surveys in 2009 prior to the commencement of the flood defence works. The numbers of individuals of salmon and trout were recorded at 12 locations¹⁰¹, and this included details of the age class of each individual. Young trout (0+ young-of-the-year) were the most common at all locations and in the river over-all, and numbers were highest at the downstream end of the river, which is what would be expected. Salmon were recorded in the river from Tanfield footbridge downstream. A total of 10 individuals were recorded on 24th June 2009, of which 5 were young-of-the-year (0+) fish, and five were older.

Surveys for the location of spawning sites have also been undertaken. The Honorary River Bailiffs undertook a survey in 2006 with the aim of identifying gravel beds in order to carry out management of them (removal of silt) to improve spawning habitat for brown trout, and to inform the flood prevention works. The area between the Bridge at Lanark Road and Bridge at Powderhall was surveyed. A total of 26 spawning beds were identified, mainly situated in the Longstone to Belford Bridge areas with little spawning activity between Stockbridge to Bonnington. The report also noted that the numbers of brown trout in the lower river were declining, due to a number of pressures, and measures to address this were suggested. This included the introduction of a programme of “raking” spawning beds in late August and early September to remove silt. A further survey was carried out in September/October 2008 to inform the flood defence works.¹⁰² This found changes to the size and location of spawning beds, which were considered to have disintegrated into many pockets of gravel spread over a wider area. These were thought to have formed as a result of high flows in August 2008.

Arup¹⁰³ plotted known locations of spawning beds in relation to works required under the flood defence works. Most spawning is thought to occur upstream of Balerno, but as juvenile fish are caught lower down e.g. at Stockbridge, this suggests that spawning may occur in the lower reaches.

6.2 Current management initiatives

Angling & Stocking

Brown Trout

The Honorary Bailiffs will continue to manage the brown trout fishery on the river. There are plans to stock 1250 brown trout in the coming season (2010). Equal numbers (625) will be stocked in March and June, of fish which are 6-8” and 10-13”. The fish are sourced from the Bellhaven fishery, and are released under licence. The costs of stocking in 2009-10 are £3800, and are expected to rise to £4000 in 2010 – 11. A minimum size limit of 10” has been set for captured fish.

It is a condition of permits that catch returns are sent in each year. However, the rate of return is currently low (around 5% for 2009), and appears to have been low for many years (averages of around 4 – 5% are included in the Integrated Environment Action Plan¹⁰⁴). This

¹⁰¹ 240m downstream of Bonnington Bridge; Bonnington; Tanfield footbridge; Edinburgh Sports Club; Murrayfield; Balgreen; Fords Road; Stenhouse Industrial Estate; upstream of Stenhouse Industrial Estate; upstream of Bogs Bridge; Spylaw Park Colinton; Juniper Green.

¹⁰² Adams, J. Water of Leith Fish spawning areas field work study. 10/10/08

¹⁰³ Arup, 2008

¹⁰⁴ Edwards-Jones, 1993

limits the availability of data on which to assess the effectiveness of the stocking programme. Further information is required in order to determine the success of the stocking programme, and how the numbers of stocked fish need to be modified with likely fishing effort. Various initiatives have been tried to increase returns. This includes increasing the value of the prize draw for catch returns.

Current activities are limited by funding. There is a policy to maintain a free fishery, and volunteers would be reluctant to collect fees for fishing.

Other species

Grayling and other coarse fish may be caught during the trout season only. This is to avoid the risk of illegal capture of brown trout.

There is no fishery for salmon on the river, principally due to the low numbers of fish present. In their consultation comments on the flood defence scheme the Forth District Salmon Fishery stated that they don't consider that the Water of Leith supports salmon due to the physical obstructions to entry, but would be responsible for administering the fishery should access improve. Under The Salmon (Fish Passes and Screens) (Scotland) Regulations 1994 safe passage must be provided for migrating salmon.

Fisheries Management Plan

Publications by the Honorary Bailiffs have identified the following issues for fisheries management:

- Siltation of spawning beds and loss of habitat of species of aquatic invertebrates.
- An increase in the bullhead population – which compete with trout for food and predate trout eggs.
- The introduction of grayling, which compete for food.
- An increase in eels, which predate eggs; and
- Low water levels – which lead to a loss of invertebrate habitat¹⁰⁵.

To help address these issues the Honorary Bailiffs are developing a fisheries management plan, which addresses the following issues:

- River flows – the Bailiffs will work to ensure that mitigation measures are included within the flood defence works to avoid impacts on fish stocks from reduced flows.
- Surveys of fish and invertebrate populations (see below).
- Habitat improvements – for example, improving pools and managing spawning beds. Spawning beds are currently raked in September between Currie and Canonmills to remove the fines.
- Stocking (see above).
- Access to the fishery. Permits will continue to be issued, and checks on poaching (mainly fishing outside the prescribed season) will continue.
- Funding. Sources of funding to will be secured.
- Protection. The presence of protected species and the implications of this for the trout fishery will be considered. For example, all species of lamprey are listed on Annex II of the Habitats Directive.
- Publicity – the fishery will be promoted through the installation of notices, publication of pamphlets, articles in magazines, newspapers etc. Twelve notices are to be installed along the river in 2010.

¹⁰⁵ Water of Leith Bailiff Report 2006

- Education – The Bailiffs have worked with Community police officers to encourage 12 – 14yrs olds to become interested in fishing. The scope for running future programmes will be considered.
- Fishing code of practice – this is publicised through the permits.
- Support for national and government organisations – all pollution incidents will be reported to SEPA.

Surveys

The Honorary Bailiffs are currently managing a project funded through the Flood Prevention Scheme to monitor the fish and invertebrate populations of the river before, during and after the flood works. The Clyde River Foundation is carrying out the surveys. It is hoped that survey works will take place between Bonnington and Coltbridge in 2010. Control sites beyond the influence of the flood works will also be selected for survey. The work will include both electro fishing and sampling of invertebrate populations.

Construction projects

Two construction projects are planned commencing in 2010: the installation of statues in the Water of Leith by the National Galleries of Scotland and flood defence works.

The National Galleries of Scotland has commissioned Antony Gormley to create six life-size human statues that will be installed at locations along the Water of Leith between the Galleries at Belford to the Docks at Leith. The statues will be installed during 2010 and the installation period has been timed to avoid trout spawning. Method statements that will avoid pollution of the river will also be produced and approved by Scottish Natural Heritage prior to installation.

Details of the flood defence scheme have been provided in the Water topic paper (see section [13.2](#)). Certain aspects of the scheme could impact on fish populations including the effects of construction works on spawning beds and the effect changes in base flow on the availability of invertebrate habitat and hence food for trout. The new compensation flows predicted from the reservoirs are lower than current levels, but are above the Q95 limit often used to set compensation flows¹⁰⁶. Also, the construction of notches in the spillway weirs of the feeder reservoirs will mean that flow rates will vary in the river in a more natural way than is currently experienced.

Water Framework Directive (WFD)

The presence of weirs, which inhibit fish migration on the Water of Leith, is one of the factors that has led SEPA to classifying this river as a Heavily Modified Water Body (HMWB) under the Water Framework Directive (see [section 13.2](#)).

Energy generation

The feasibility of generating hydro-electric power from the Water of Leith has been considered¹⁰⁷ with further work going on at some sites (see [section 13.2](#)) and there is also interest in establishing sites near to Harperrig and Threipmuir Reservoirs. The construction of new weirs could act to further limit fish migration within the river.

¹⁰⁶ Arup, 2003a

¹⁰⁷ Renewable Devices Energy Systems Ltd, 2006

6.3 Objectives and actions

Aims & objectives: *To safeguard and enhance the Water of Leith as an urban game fishery.*

Specific objectives for fisheries management are:

- To maintain an adequate stock of brown trout in the river to support game angling.
- To increase the rate of catch returns.
- To identify ways of increasing revenue returns from angling to provide security of funding and assist with long-term planning.
- To maintain and improve the habitat for brown trout (and other fish species, such as lamprey and Atlantic salmon).
- To promote the Water of Leith as an educational and amenity resource for angling.

A number of the Objectives relating to water quality and flow will also benefit fish populations, for example objective [W5](#) relating to compensation flows, and objective W3, which considers barriers to fish passage. See [section 13.3](#) for a full list of these objectives.

Rationale: The Water of Leith is unusual in that it provides an opportunity for free trout fishing. This is an amenity to visitors and residents alike. The focus is on game fishing as good coarse fishing opportunities are available elsewhere on the Union Canal, and it avoids potential conflicts of interest between seasons for game and coarse fish. The fishery is currently free, and there is a strong aspiration to maintain this. However, this means that alternative sources of funding need to be sought in order to provide a secure footing for planning future management. In addition to Council core funds, there are opportunities for alternative funding sources that should be explored. The Bailiffs currently provide assistance for survey work associated with the flood defence works, and are likely to have a role in the implementation of the scheme, but this is a relatively short-term requirement and other options need to be explored.

Actions to safeguard and enhance the Water of Leith as an urban game fishery (Lead agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A12).

Action	Lead Agency & partners ¹⁰⁸	Targets
F1: Undertake monitoring of fish populations (A12).	Honorary Bailiffs , CEC Services for Communities Potential to involve University students in projects e.g. Napier.	a) Trout populations should remain distributed throughout the river. b) There should be evidence of natural spawning and maintenance of a mixed age-class of fish. c) The number of fish caught each season per unit effort should remain constant or increase.
F2: Undertake an annual programme of	Honorary Bailiffs ,	Numbers to be stocked to

¹⁰⁸ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage

Action	Lead Agency & partners ¹⁰⁸	Targets
stocking with brown trout. (A13)		be based on monitoring data and may need to be increased if fishing effort increases, or reduced if natural recruitment improves.
F3: Promote a project to explore the impact of bullhead and/or grayling on trout populations (requires the development of a brief, possibly seeking funding or there is the potential to make this into a student project – discuss with Napier University) (A71).	Honorary Bailiffs, Opportunity for student project	Understanding of relationship between bullheads and trout in the Water of Leith.
F4: Improve rate of angling returns. Options to investigate include: (a) establishing an on-line record system through the Water of Leith Conservation Trust website; (b) Twitter account (c) “returns” boxes in angling shops and visitor centre (d) Bailiffs keeping a record of catches made during their bank inspections. (A56)	Honorary Bailiffs, WoLCT	Increase the current rate of returns (which appears to be fairly constant at around 4 - 5%), by 5% each year.
F5: Establish a funding group to review options to obtain funding for additional activities beyond core functions of the Bailiffs (e.g. work with local Police). Possibilities to investigate include (a) weekend/evening classes in fishing (b) publication of a fishing guide (c) sponsorship by private companies (d) corporate hospitality events (A51).	Honorary Bailiffs, CEC Services for Communities, WoLCT	a) Establish funding group. b) Identify one new source of funding for additional activities.
F6: Maintain programme of raking spawning beds. (A14)	Honorary Bailiffs	Major beds to be raked.
F7: Ensure that the mitigation measures included in the Environmental Action Plan for the flood defence scheme are implemented. (A29)	CEC City Development – Structures & Flooding Honorary Bailiffs	Implementation of each of mitigation measures.
F8: Monitor the location of spawning beds and trout habitat. (A43)	Honorary Bailiffs	a) Assessments at completion of flood defence works. b) Repeat assessment on 5-year cycle. c) No reduction in number of spawning beds.
F9: Review existing data on fish habitat to identify benefits in removing individual weirs to contribute to audit on weirs. (N.B. the assessment of benefits to fish passage will need to be assessed within the context of barriers to fish passage presented by the lock gates at Leith) (A39).	SEPA, Honorary Bailiffs	Conduct analysis of existing data.
F10: Agree compensation flows post construction of flood defence works that	SEPA, CEC City Development –	a) Flows are adequate to retain trout populations in

Action	Lead Agency & partners ¹⁰⁸	Targets
allow for fish requirements in the river (and in the reservoirs). (A26)	Structures & Flooding, Honorary Bailiffs	the Water of Leith. b) No adverse impacts on fish populations in the reservoirs.
F11: To establish links with landowners upstream of Balerno to work together on habitat improvements. (A52)	WoLCT, CEC Forest Service	Identify landowners and hold exploratory meeting with fisheries interests upstream of Balerno.
F12: To work with community police to encourage young people to take up fishing. (A44)	Honorary Bailiffs, Community Police	Seek funding to hold one event every other year.
F13: Publicise the fishing on the Water of Leith through articles, notices etc. (A15)	Honorary Bailiffs, WoLCT, CEC CRS	a) Install 12No. notices per year at various locations. b) One article per year in the press.

REFERENCES

- Adams, J. Water of Leith Fish spawning areas field work study. 10/10/08
- Arup, 2003. Water of Leith Flood Prevention Scheme: Environmental Statement Volume 1: Text. November 2003 for City of Edinburgh Council
- Arup. 2008. Water of Leith Flood Prevention Scheme, Ecological Review, Revision 2, Jan 2008 for City of Edinburgh Council.
- Clyde River Foundation. 2009. Unpublished data provided to Water of Leith Bailiffs.
- Edwards – Jones, E. 1993. The Water of Leith Integrated Environmental Action Plan. Scottish Wildlife Trust.
- Forth Fisheries Foundation. 2003. Spawning and Fish Interest Survey of Bavelaw Burn. Prepared for City of Edinburgh Council Water of Leith Flood Prevention Scheme.
- Forth Fisheries Foundation. 2003? Annual electric fishing monitoring of juvenile fish in main stems of all Foundation rivers, 2002. Report 2002/6
- Gardiner, R. 1994. Survey results from 1994. Letter from R. Gardiner to A. D. Jamieson, Lothian Regional Council 19 October 1994
- Gardiner, R. 1995a. Survey results from 1995. Letter from R. Gardiner to A. D. Jamieson, Lothian Regional Council 21 June 1995
- Gardiner, R. 1995b. Survey results from 1995. Letter from R. Gardiner to A. D. Jamieson, Lothian Regional Council 19 October 1995
- Gardiner, R. 1996. Survey results from 1996. Letter from R. Gardiner to A. D. Jamieson, Lothian Regional Council 17 October 1996
- Maitland, P. S. 1994. Fish. Chapter 11 in The Fresh waters of Scotland Ed. P. S. Maitland, P. J. Boon & D. S. McLusky, Wiley.
- Napier University. 2006. Water of Leith Fish Spawning Desk Study Report on Impacts of Flood Defence Scheme Teresa F Fernandes Rob Briers John Kinross Dominic Welsh
Based on a desk study.
- Priestly, G. 1996. Electro-fishing surveys of Water of Leith trout populations 1995-6. Unpublished summary based on data provided by Freshwater Fisheries Laboratory
- Renewable Devices Energy Systems Ltd, 2006. Water of Leith Micro Hydro Technical Feasibility Study. City of Edinburgh Council Sustainable Development Unit.
- Water of Leith Bailiff Bulletin. 2010. Issue 8. Winter 2010
- Yeomans, W. E., McGillivray, C., McColl, D. & Murray, D. S. 2008. The Fish community of the Water of Leith at Kinleith Mill, Juniper Green. Clyde River Foundation, University of Glasgow Report ref: CRF2008/07

<http://www.edinburghoutlook.co.uk/2008-06/news/1716.aspx>

<http://harperrigfisheries.com/Harperrig>

<http://www.mallenyangling.co.uk/>

<http://www.threipmuir.co.uk>

<http://www.scotland.gov.uk/Publications/2008/06/26110733/0>
fisheries strategy

Scottish freshwater

7 ARCHAEOLOGY, CULTURAL AND BUILT HERITAGE

This topic paper reviews issues related to the historic environment of the Water of Leith. It covers archaeological features, and aspects of the cultural and built heritage. There are links between this and other topic papers including [landscape](#) and [education and interpretation](#).

7.1 Historical Context/Current situation

Sources of information

The main sources of information are the on-line databases maintained by Historic Scotland and the Royal Commission on Ancient and Historic Monuments (RCAHMS) (e.g. Pastmap). An overview of cultural heritage remains around the reservoirs and along the Water of Leith was prepared as part of Environmental Assessment work to support the flood alleviation works¹⁰⁹. The mill heritage of the river valley has been documented by Graham Priestly¹¹⁰.

Although there has been no comprehensive survey of the whole of the Water of Leith valley, it is likely that the area has been settled since the last ice age. This means that the whole river has archaeological and cultural interest, and archaeological remains may be encountered at any location.

The following description seeks to highlight some of the cultural heritage features that are best well-known along the river, and is not intended as a comprehensive account of the archaeological interest of the area.

Pre-historic features

The first known signs of settlement date back to the 2nd millennium BC¹¹¹. Prehistoric remains have been recorded from the Dean Village, Saughton Hall and Roseburn Court, and include late Bronze Age axes, and prehistoric burial sites. Prehistoric remains have also been recorded around the reservoirs. For example, a struck flint flake of Neolithic or Bronze Age was found on the north-western bank of Harlaw Reservoir in 1993¹¹².

Castles, manor houses and estates

There are several manor houses, castles and mill sites with associated settlements, many of which date back to medieval times. For example, Redhall Castle dates back to at least the 12th Century¹¹³. Some of these sites have been recognised as of National importance for their historical value (e.g. Cairns Castle – see [Assessment of Value](#) below).

Mill heritage

The mill history of the river has been documented by Graham Priestly¹¹¹. Some of the mill sites date back to medieval times. For example, Bonnington Mills were first recorded in 1143.

¹⁰⁹ e.g. CFA, 2001; CFA, 2002; CFA, 2008

¹¹⁰ Priestly, 2001

¹¹¹ CFA, 2001

¹¹² CFA, 2002

¹¹³ J. Lawson *pers comm*

Priestly¹¹⁴ quotes that, based on the statistical account of Scotland, there were 76 mills along the 23 miles of the Water of Leith in 1791. This had reduced to 37 mills on the main stem (excluding Bavelaw Burn) by 1850. The cultural heritage assessment for the flood defence scheme identified nine mills and four weirs in the areas to be affected by the works¹¹⁰, although this assessment did not consider the whole length of the river.

The mills undertook a variety of tasks including grinding corn, flour, snuff, spices and bark, paper-making, washing and waulking (fulling) cloth, and pumping water for tanning, cutting and polishing ornamental stone and sawing timber. The mills had an important effect on the appearance of the river and settlement along its banks. Harlaw, Threipmuir and Harperrig Reservoirs were constructed to secure flows along the river during the summer months once the headwaters were tapped for water supply in the 1850s.

Many of the mill buildings and associated features (e.g. lades) have been demolished. A number of weirs remain, although none currently receive protection. An assessment of the location of weirs and mills was undertaken by City of Edinburgh Council some years ago, but now needs updating¹¹⁵.

Other features

The Water of Leith flows through the Georgian New Town of the City, which has been designated as a World Heritage Site. Further details are provided below (see [World Heritage Site](#)).

Notable features from the Victorian period are the Colony Houses near Stockbridge, which were built in 1861 and lie within a Conservation Area (see below).

Saughton Park contains the area used for the Scottish National Exhibition in 1908.

Leith Harbour and Docks has a varied and rich history. It has had strategic importance in battle, and in trade. Several features in the docks are protected as [Scheduled Monuments](#) (see below).

Other features are discussed within the designations section below.

Designations

A range of national, regional and local designations exist. The following summary focuses upon those found along close to the Water of Leith between the reservoirs and the sea, although some mention is made of sites near the reservoirs.

Scheduled Monuments

These are monuments of national importance which are identified by Historic Scotland and are protected under the Ancient Monuments and Archaeological Areas Act 1979. Six scheduled monuments occur close to the Water of Leith (see Figure showing Environmental Assets), of which three are associated with the industrial history of Leith Docks (Victoria Swing Bridge, the Swing Bridge and lock at Dock Place, and a dry dock off Sandport Place). The Union Canal, Colinton Castle and Lennox Tower are the other sites.

Two additional sites, Bavelaw farmstead and Cairns Castle, are present adjacent to the reservoirs.

¹¹⁴ Priestly, 2001

¹¹⁵ J. Lawson *pers comm*

Listed Buildings

These are structures of special architectural or historic interest that are identified by Historic Scotland and are protected under the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997. Three categories of listing are used to distinguish between different levels of interest. Category A buildings are those considered to be of national or international importance; Category B buildings are of regional interest, and those of local importance are listed Category C(S).

Numerous listed buildings are present along and adjacent to the Water of Leith. The Figure showing environmental assets contains only a selection of the total number of listed buildings in the area, but focuses upon those whose interest is linked to their proximity and history of the river (e.g. mill buildings, buildings associated with the docks). It includes industrial structures and buildings, as well as aesthetic features such as St Bernard's Well. Reference should be made to the full register, which can be accessed by the Pastmap website (www.pastmap.org.uk).

An additional listed building, Bavelaw Castle, dating from the sixteenth century, is situated close to Threipmuir Reservoir¹¹⁶.

National Monuments Record of Scotland (NMRS)

This is the national collection of material relating to the archaeological and architectural heritage of Scotland. It includes listings of locations considered to be of historical interest, or locations from which archaeological material has been collected. A selection of features included on the Register are shown on the Figure of environmental assets. This focuses upon features whose interest is linked to their proximity of the Water of Leith, such as bridges, locations of mills etc.

Additional sites listed on the register are present within 500m of Harperrig, Harlaw and Threipmuir Reservoirs. These include rig and furrow field systems, old farms, walls, sheepfolds, quarries and the reservoir structures themselves¹¹⁷.

Conservation Areas

These are defined by Section 61 of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997, as "...areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance". These are distinct from individual buildings protection. Areas are identified by the local authority. Edinburgh City Council has identified several settlements along the Water of Leith as Conservation Areas: Balerno, Colinton, Coltbridge and Wester Coates, Currie, Dean, Inverleith, Juniper Green, Leith, New Town. Character appraisals for each of these areas have been prepared, that set out the features that are of special value¹¹⁸.

Historic Gardens and Designed Landscapes

Gardens and designed landscapes that are considered to be of national value are included in an *Inventory of Gardens and Designed Landscapes in Scotland*, which is maintained by Historic Scotland. The Inventory includes private gardens, parks, policies in country estates and botanical gardens. Sites are selected on the basis of their value as an individual work of art, historical value, architectural value, horticultural, arboricultural or silvicultural value, scenic value, nature conservation value, and (more recently), archaeological value.

¹¹⁶ CFA, 2002

¹¹⁷ CFA 2002 & CFA. 2008

¹¹⁸ CEC, 2002

Historic Gardens and Designed Landscapes were considered in the [landscape](#) topic paper of this management plan.

World Heritage Site

The Old and New Towns of Edinburgh were inscribed by UNESCO (United Nations Educational, Scientific and Cultural Organisation) as a World Heritage Site (WHS) in December 1995. Inclusion is recognition of a site's "outstanding universal value".

The designation is based on the juxtaposition of the contrasting styles of the medieval Old Town and the planned Georgian New Town. The presence of some of the finest public and commercial monuments of the New-classical revival in Europe is seen as an important feature, as is the dramatic topography of the Old Town combined with the planned alignments of key buildings in both the Old and the New Town, which results in spectacular views and panoramas and an iconic skyline. The condition of significant buildings and spaces is also important¹¹⁹. The site also includes the ancient milling settlements on the Water of Leith where it cuts through high ground in the north-west of its boundary¹²⁰. There are numerous built heritage and natural environment designations within the WHS boundary.

Recognition as a World Heritage Site does not confer any formal protection upon the built and cultural heritage features, but it is recognised through local plans and is a material consideration in planning decisions.

The Edinburgh World Heritage Trust was established in 1999, and is responsible for preparing a management plan for the site (see current management initiatives, below).

The Water of Leith Valley is an integral part of the WHS. It contributes a number of features to the outstanding universal value of the site, including the fact that it was deliberately left undeveloped in the 18th and 19th century as a part of a carefully planned landscape; the presence of significant monuments along its length, including St Bernard's Well and the Telford designed Dean Bridge; the historic and current amenity value for residents of the WHS and visitors; and its beauty¹²¹.

Assessment of value

The Environmental Statement for the flood defence works assessed the importance of cultural heritage features¹²². Five sites of National Importance were identified, which included a number of listed buildings: The Colonies; Dean Bridge; the Cathedral Mission; Dean Village; and Murrayfield Stadium (a sports venue). One site of Regional Importance, Lady Haig's Poppy Factory, was identified because of its links with World War One. Thirty-four sites are considered to be of Local Importance. These include several bridges, buildings, mills and weirs, cemeteries, gardens, sporting venues, two telephone boxes and a commemorative plaque.

¹¹⁹ <http://whc.unesco.org/en/list/728>

¹²⁰ CEC, 2009a

¹²¹ A. Wilkinson, Director, Edinburgh World Heritage Trust *pers comm*

¹²² Importance was assessed according to thresholds of archaeological significance proposed in NPPG5. *Sites of National Importance* are those protected by scheduling under the 1979 Act, and sites of "schedulable quality". *Sites of Regional and Local Importance* do not merit scheduling, but have significance in a regional or local context. *Sites of lesser importance*, may comprise component parts of a landscape rich in archaeological monuments, and thereby gain greater significance.

Of those features identified within 500m of the reservoirs, three sites were considered to be of national importance (Bavelaw farmstead, Cairns Castle and Bavelaw Castle). Four sites were considered to be of regional importance, which includes the three reservoirs and a drove road. A further 36 sites were considered to be of local importance, and included farmsteads, cultivation remains and findspots. Ten sites were considered of lesser importance¹²³.

Public access and information

Features such as the weirs are easy to view from the Water of Leith walkway. Access to built structures and buildings is more limited. St Bernard's Well is open to the public on certain dates. Access is permitted by the City of Edinburgh Council, with assistance from the Dean Village Association.

7.2 Current management initiatives

Gardens and Designed Landscapes

Edinburgh Council is consulting on a series of gardens and designed landscapes that are of regional and local importance¹²⁴ to complement those that are listed on the Inventory of gardens and designed landscapes. This is discussed further in the [landscape](#) topic paper.

Management Plan for World Heritage Site

UNESCO requires management plans to be prepared for all World Heritage Sites. A new plan, which will cover the period 2010 – 2015, is being prepared by the Edinburgh World Heritage Trust, in association with the City of Edinburgh Council and Historic Scotland.

The plan specifies how the outstanding universal value of the WHS will be protected and maintained. It will include principles to guide, co-ordinate and augment planning guidance included in the Central Edinburgh Local Plan and the Edinburgh City Local Plan. It will follow UNESCO Operational Guidelines and will include an executive summary and purpose, site description and brief history, statement of significance, interests in the World Heritage Site, current issues, vision and long term aims (2010 – 2040), short term objectives (2010 – 2015), and a monitoring strategy¹²⁵.

The Twelve Monuments Project is joint three-year collaboration between the Edinburgh World Heritage Trust and the City of Edinburgh Council. The project aims to restore some of Edinburgh's most famous statues and monuments. There is an aspiration to include St Bernard's Well within the scheme, subject to funding.

Flood defence works

Details of the flood defence works are provided in the [Water](#) topic paper. The proposals will have major adverse impacts on 16 cultural heritage sites, four of which are recent and considered to be of lesser importance. A programme of pre-construction recording has been implemented to offset the predicted impacts on the remaining twelve sites, in the event that the sites cannot be preserved untouched by the proposed development.¹²⁶

¹²³ CFA, 2002

¹²⁴ CEC, 2009b

¹²⁵ CEC 2009a

¹²⁶ CFA, 2001.

A series of photographs were undertaken of key sites in Spring 2009. This included nine bridges, three weirs, Longstone Inn and Longstone Village, Coltbridge mill lade, and the Colonies.¹²⁷

7.3 Objectives and actions

Aims & objectives: *To identify, safeguard and promote features of archaeological and cultural importance.*

Specific objectives for archaeology and cultural heritage are:

- To understand and manage the location, condition and value of archaeological and cultural heritage resources along the Water of Leith.
- To promote active management of cultural heritage resources.
- To raise awareness and knowledge of, and public support for, the rich cultural heritage associated with the Water of Leith.

Rationale: There is a long history of settlement within the Water of Leith Valley. This means that features of archaeological importance can be encountered anywhere along its length. Some features, such as weirs and mill lades, are gradually deteriorating over time, and many walls and other built structures only receive repair to avoid risk to human health and safety, rather than in response to maintaining the quality of the structure. Much of the river is wooded, and large parts of this are in need of management. Trees and vegetation can pose a significant threat to archaeological remains. Roots can break apart built structures, and falling boughs and trees may create physical damage to built structures. For example, railings around St. Bernard’s Well were damaged when trees fell on them, and there are other trees in the vicinity, which could cause damage to the structure if they were to fall¹²⁸. There is a risk that an important part of the river’s cultural heritage could be lost through neglect. The urban setting of much of the river means that it is under pressure for development. Changes in management of water resources, driven by the European Water Framework Directive, will also place emphasis on removing artificial structures and features in the river – many of which have cultural significance. There are good existing mechanisms for different agencies to work together in managing the Water of Leith, but these have a heavy reliance upon biodiversity expertise, and cultural heritage interests may be under-represented.

Actions to identify, safeguard and promote features of archaeological and cultural importance (Lead agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A45).

Action	Lead Agency & partners ¹²⁹	Targets
H1: Conduct an audit (including production of map) of archaeological and cultural heritage resources associated with the river channel, including weirs, and assess their importance ¹³⁰ . (A45)	CEC City Development, CEC Archaeologist. (Historic Scotland may be involved in relation to	a) Seek funding for audit. b) Completion of Audit.

¹²⁷ CFA, 2009.

¹²⁸ P. McAuley, *Pers comm*

¹²⁹ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

¹³⁰ This was an action in the Integrated Environmental Action Plan for the Water of Leith that was produced in 1993 (Edwards-Jones, 1993). A preliminary audit of features associated with the mills exists, as part of survey

Action	Lead Agency & partners ¹²⁹	Targets
	designated features) (SEPA may assist with assessment of weirs in relation to fish passage) (Will require liaison with Royal Commission for Ancient and Historic Monuments) Scope for student project	
H2: Agree (in consultation with other interests) which weirs are priorities for retention, which ones can be allowed to degenerate, and which ones may be suitable for removal for biodiversity gain (A39).	SEPA, CEC City Development, CEC Archaeologist, Honorary Bailiffs, WoLCT (May require liaison with Forth District Salmon Fishery Board/ River Forth Fishery Trust & Royal Commission on Ancient and Historic Monuments)	Hold meeting.
H3: Identify structures/ features that are in poor state of repair/ are at risk e.g. from erosion, self-sown trees etc. (A45)	CEC Archaeologist, EWHT WoLCT, CEC Structures & Flooding, CEC CRS¹³¹. (Historic Scotland may be involved in relation to designated features & discussion may be required with Scottish Civic Trust who compile the Risk Register for Historic Scotland)	a) Produce a schedule showing risk for each feature. b) Produce a work programme for addressing aspects of high risk.
H4: Identify cultural heritage features at risk from trees. (A46)	CEC Archaeologist, CEC Forest Service, CEC CRS (Discussion may be required with Scottish Civic Trust who compile the Risk Register for Historic Scotland)	Production of schedule of structures at risk & action required.
H5: Introduce a phased maintenance programme for features at greatest risk from trees. (A46)	CEC Forest Service, CEC Archaeologist with support from, CEC	Implementation of maintenance programme.

work undertaken by J. Lawson, but needs to be updated in the light of recent changes and developments. Also, some audit information was collected as part of the environmental assessment work for the flood protection works. These surveys need to be brought together and updated.

¹³¹ The Water of Leith Conservation Trust, CEC Structures and Flooding Department and CEC Ranger Service carry out condition assessments of various aspects of the river and walkway. These data could be used to help in assess risk for features of cultural interest.

Action	Lead Agency & partners ¹²⁹	Targets
	Services for Communities, CEC CRS	
H6: Participate in the development and implementation of the management plan for the Edinburgh World Heritage Site. (A25)	CEC Development Department, WoLCT, CEC Archaeologist, CEC Museums Service	Provision of comments relevant to Water of Leith.
H7: Support restoration programmes for notable buildings e.g. grottos in Craiglockhart and Colinton Dell, St Bernard's Well, St George's Well (A58).	CEC Archaeologist, CEC Museums Service, CEC City Development – Planning, Private groups & organisations (e.g. Dean Village Association) (Historic Scotland may be involved for designated sites/grant applications)	a) Inclusion of St Bernard's Well in the "Twelve Monuments" Project. b) Identification and support for at least one project.
H8: Include archaeological/ cultural heritage expertise within the Water of Leith Action Group (A21).	WoLAG Organisations who might be invited include CEC Archaeologist	Inclusion of cultural heritage representative on the Water of Leith Action Group.
H9: Include cultural heritage representatives in annual management meetings. (A22)	WoLAG, WoLCT, CEC archaeologist, EWHT, HS	Attendance at meetings.
H10: Ensure that heritage features associated with the docks e.g. bollards, mooring rings, cobbles, are incorporated within development proposals as set out in Leith Docks Development Framework. (A59)	CEC Development Department, CEC Archaeologist, developers	Review of all development proposals against design principles for Leith Docks Development Framework; explicitly those relating to incorporation of heritage features.
H11: Produce a leaflet that provides information about the historical and cultural aspects of the river and how these relate to the development of the City of Edinburgh (e.g. parallel development of paper mills with printing presses in the City) ¹³² . (A69)	WoLCT, CEC Archaeologist, CEC museums service, CEC CRS.	Production of leaflet via website (and in paper form).
H12: Continue to include details of the cultural heritage of the river in guided walks. (A10)	WoLCT (may require liaison with CEC Archaeologist)	a) Targets to be set annually in WoLCT business plan. b) Include details in all 4 walks per annum currently projected by the WoLCT.
H13: Continue to include details of the cultural heritage of the river in education programmes. (A11)	WoLCT, CEC CRS	a) Targets to be set annually in WoLCT business plan & CEC CRS work programme. b) Use cultural heritage as the focus for 10 of the projected 60 community

¹³² This is additional to the current Water of Leith map, which does include details of features of historical interest and importance

Action	Lead Agency & partners ¹²⁹	Targets
		group visits, and 10 of the projected 125 school visits.
H14: Undertake a community archaeology project ¹³³ (A53).	CEC Archaeologist , WoLCT, CEC CRS, Volunteers & community groups. Scope for student involvement.	a) Establish steering group. b) Scope work. c) Secure funding. d) Completion of field investigations. e) Publication of results.
H15: Include information about the cultural history of the river in the Water of Leith Visitor Centre (A42).	WoLCT , CEC Archaeologist, CEC Museums Service	Inclusion of at least one panel relating to cultural history in re-vamped visitor information.
H16: Hold an exhibition of artefacts associated with the Water of Leith (A47).	WoLCT , CEC Archaeologist, CEC Museums Service	Hold at least one exhibition using artefacts found along the Water of Leith.
H17: Develop an audio trail along the river e.g. through creating a downloadable podcast from the Water of Leith Trust website. (A40)	WoLCT , CEC Archaeologist, HS	Production of downloadable podcast.
H18: Improve public access to historic buildings in public ownership (A60).	CEC Archaeologist , CEC Museums Service, CEC CRS, Private and community groups.	a) Facilitate access to St Bernard's Well at least 6 times per year. b) Facilitate access to one new location e.g. St George's Well.

¹³³ There is a precedent for organising such projects in Edinburgh e.g. work to explore roman remains at Cramond.

REFERENCES

City of Edinburgh Council. 2002. The Leith Conservation Area Character appraisal. Approved by the Planning Committee on 18 April 2002

City of Edinburgh Council. 2009a. SEA Screening decision, Edinburgh World Heritage Site Management Plan. December 2009

City of Edinburgh Council. 2009b. Edinburgh Planning Guidance: Gardens and Designed Landscape – Draft for Consultation. Report for Planning Committee 6 August 2009

CFA, 2001. Water of Leith Edinburgh Environmental Statement – Cultural Heritage and Archaeology CFA Report No. 685 *Commissioned by City of Edinburgh Council*

CFA. 2002. Harperrig, Threipmuir and Harlaw Reservoirs Flood Alleviation Scheme Environmental Statement Cultural Heritage and Archaeology CFA Report No. 702 *Commissioned by City of Edinburgh Council*

CFA. 2008. Water of Leith Flood Prevention Scheme, Harperrig Reservoir, West Lothian. Watching Brief and Walkover Survey. Report No. 1486

CFA. 2009. Water of Leith Flood Prevention Scheme Photographic Survey Report No. 1640

Edwards – Jones, E. 1993. The Water of Leith Integrated Environmental Action Plan. Scottish Wildlife Trust.

Peter McGowan Associates & Christopher Dingwall. 2009. Edinburgh Survey of Gardens and Designed Landscapes. April 2009

Priestly, G. 2001. The Water Mills of the Water of Leith. Water of Leith Conservation Trust, Edinburgh

8 RECREATION AND ACCESS

This topic paper reviews how people use the river and walkway for recreation. Specific uses of the river e.g. fisheries, are dealt with in other topic papers. There are also links with actions for [education and interpretation](#), and [management](#).

8.1 Historical Context/current situation

Access is focussed on the Water of Leith Walkway and around the Reservoirs of Threipmuir, Harlaw and Harperrig. There is no formal access route along the Water of Leith between Harlaw Reservoir and Balerno.

The Water of Leith Walkway was completed in 2002 following receipt of Millennium Project Funding. The walkway extends from Balerno to the Leith Docks. The route is suitable for walking and cycling, and is partially accessible by wheelchairs and by horseback¹³⁴. The Walkway has been identified within Edinburgh's [Core Paths Plan](#)¹³⁵ (see below).

The walkway passes through a number of the City's parks, which are managed by City of Edinburgh Council Services for Communities. Management is divided between three neighbourhood teams and the Countryside Ranger Service. Management issues which were raised by these teams include the interaction between different users who travel at varying speed on the walkways (cyclists, pedestrians, horse riders), drainage and maintenance of gullies, access points to the walkway, and wild camping in Craiglockhart and Colinton Dell.

Harlaw and Threipmuir Reservoirs are popular sites within the Pentland Hills Regional Park. There is a visitor centre and car park at Harlaw. Harperrig receives less usage¹³⁶.

Edinburgh Public Parks and Gardens strategy¹³⁷

The Edinburgh Public Parks and Gardens Strategy was produced in 2006. It sets out aspirations for parks and gardens and includes guidance on how to achieve them. The strategy is a means of matching the availability, function and role of parks and gardens with the changing requirements as identified by user surveys. The vision is to create "*A quality parks system worthy of international comparison; accessible, diverse and environmentally rich; which fulfils the cultural, social and recreational needs of the people.*" One of the goals is to conserve the natural habitat and wildlife in the parks.

The Strategy maps sections of the Water of Leith as including Parks, but does not recognise the whole of the river as an open space for policy purposes. This may be due to the fact that the walkway passes through land not in Council ownership.

Access Strategy

The Access Strategy was developed in 2003. It sets out a framework for developing opportunities for walking, cycling and horse riding in Edinburgh. Its vision is to create:

¹³⁴ A report was produced that demonstrated that the walkway project had taken all reasonable steps to accommodate disabled people and wheelchair users. Hardies, 2000

¹³⁵ ERM & Natural Capital, 2008

¹³⁶ Pentland Hills Regional Park Ranger Service, *pers comm*

¹³⁷ W J Cairns & Associates, 2006

'An integrated and inclusive network of routes for walking, cycling and horse riding which contributes to Edinburgh's status as a world class city by ensuring that everyone who lives in, works in and visits the city can move around it easily and in a sustainable way'.¹³⁸

This has formed the policy framework for the development of the Public Parks and Gardens Strategy and the Core Paths Plan.

Core Paths Plan

The Core Paths Plan identifies a system of key routes for non-motorised access through the City, and has been produced in accordance with the requirements of the Land Reform (Scotland) Act 2003.

The aspiration for management of core paths is to work towards a situation where each core path is: safer; appropriately signposted; accessible; and well maintained¹³⁹.

The plan is to be monitored and formally reviewed at an appropriate frequency.

The Water of Leith Walkway and the paths around Threipmuir and Harlaw are included within the Core Path Plan.

Edinburgh Outdoor Access Strategy

An open space strategy is being developed¹⁴⁰. The strategy will ensure that a coordinated approach is taken to protecting and developing the city's network of open space. It will be accompanied by 12 action plans, one for each Neighbourhood Partnership area, setting out site-specific proposals for change in open spaces. The strategy and plans will be used to inform plan development, to make decisions on the loss of open space and to inform investment and site management decisions. The strategy and plans are due to be completed later in 2010.

Water of Leith Walkway Maintenance Plan 2008

A comprehensive review of the condition of all features present along the Walkway was made in 2008. The report lists defects and recommended remedial actions on all paths, facilities, furniture and infrastructure on the Water of Leith Walkway. The report excludes all waymarking, signage and interpretation as these aspects had been previously reviewed. Defects were graded on a seven point scale in terms of the priority of action, ranging from immediate to being addressed more than five years from the date of the plan. The plan also identifies all the infrastructure features along the route, and the frequency with which they need to be assessed.

The CEC Countryside Ranger Service carries out weekly inspections within Craiglockhart and Colinton Dells and monthly inspections of the walkway¹⁴¹. The Water of Leith Conservation Trust uses volunteers to carry out inspections of the walkway (see [Management](#) topic paper), who record activities as well as the condition of features.

¹³⁸ CEC, 2003

¹³⁹ ERM & Natural Capital, 2003

¹⁴⁰ City of Edinburgh Council, 2009

¹⁴¹ CEC Ranger Service *pers comm*

Infrastructure

The main components of the walkway are the path itself, steps, ramps and boardwalks, seats, signs, lighting and litter bins. The location of seating and lighting is shown on the Figure showing management issues.

The condition of footpaths is the main reason that members of the public contact the Council¹⁴². Drainage across the footpath is also a problem in some areas. Gullies along the walkway are not adopted, which means that there is little current maintenance (see [Management](#) topic paper).

Seats

Seating is mainly confined to key viewpoints e.g. near Currie Kirk, in public parks, near the National Gallery and around the “public promenade” areas in Leith. There is no consistent style in the choice of seating style. This is particularly pronounced at Bell’s Weir, near the National Gallery, where three different styles of seat are used. This detracts from the consistent branding of the Walkway as a single entity. Seats provide the opportunity for people to rest and enjoy the views, but also detract from the rural feel of a path. There is no statutory guidance on the spacing of seats along paths. Guidance from SNH¹⁴³ comments on the types of location where seating is valuable¹⁴⁴, but does not suggest the minimum distance between seats.

Signs

Issues linked to signage of the Water of Leith are discussed in the [Education and Interpretation](#) Topic paper.

Lights

Street lights are mainly confined to sections of the walkway which also form part of other path networks e.g. through Roseburn Park, near new housing development by the by-pass, and near Murrayfield. Whilst an absence of lighting will limit the use of the walkway at night, it has significant benefits for wildlife, particularly bat species.

Litter bins

There are relatively few litter bins along the route. They are limited to areas that have vehicle access so that they can be emptied.

8.2 Objectives and actions

Aims & objectives: *To provide a walkway of high quality and promote its responsible use.*

Specific objectives for access and recreation are:

- Maintain the Walkway in a state of good repair.
- Identify opportunities to create new routes associated with the Walkway.
- Promote responsible recreational use of the Walkway.
- Promote the Water of Leith using consistent “high quality” branding.

Rationale: Whilst the usage of the walkway has not been quantified recently, it is clear that it is used by people for a variety of reasons. It is used as a pleasant means of moving between places and as a recreational destination in its own right. The nature of the route,

¹⁴² D. Cruickshank, *pers comm*

¹⁴³ SNH, 2002

¹⁴⁴ Seats or resting points are most useful at the top and bottom of slopes and at intervals along more difficult or arduous sections of path.

including adjacent habitats, means that regular checks are necessary to ensure that the footpath is in a state of good repair. Street furniture is relatively limited along the route, which adds to the semi-rural nature of much of the walkway. However, there is no consistency in the style of furniture that is present, even at particular locations, which detracts from the visual quality of the route. Street lighting is very limited, which adds to the value of the habitat for wildlife.

Actions to provide a walkway of high quality and promote its responsible use (Lead Agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A7).

Action	Lead Agency & partners ¹⁴⁵	Targets
R1: Continue to monitor the condition of the walkway ¹⁴⁶ (A7)	CEC CRS, WoLCT	Completion of (at least) monthly visits.
R2: Implement outstanding actions contained in “Water of Leith Maintenance Plan”. (A7)	CEC CRS, WoLCT	a) Completion of actions listed as priority 1 – 3. b) Completion of actions listed as priority 4.
R3: Install new signs (A50).	CEC CRS, WoLCT,	Installation of three new signs ¹⁴⁷ .
R4: Carry out improvements to access points that have already been identified. (A7)	CEC CRS	Completion of improvements to 2 – 3 access points.
R5: Identify potential new access points to provide links between different footpaths. (A74)	WoLCT, CEC City Development, PHRPRS	Identification of 2 new access points.
R6: Investigate circular routes between the Walkway and Pentland Hills Regional Park to create a “hills to the sea” route. (A74)	CEC City Development, CEC CRS, WoLCT, Pentland Hills Regional Park Ranger Service	Identification and publication of one route.
R7: Upgrade the footpath in Poet’s Glen (A74).	CEC CRS, PHRPRS	Upgrade of route.
R8: Introduce system of monitoring usage of key sections (A54).	CEC CRS, WoLCT	Production of annual records of usage of the walkway.
R9: Analyse existing usage data collected by WoLCT volunteers. (A73)	WoLCT Possible student project	Report identifying the nature and level of current use of the walkway.
R10: Conduct a review of improvements required to enhance accessibility for all groups (A55).	CEC CRS	Production of accessibility report.
R11: Publicise the walkway to visitors to the City. (A46, A70).	WoLCT, VisitScotland.	Distribution of 100 maps to tourism businesses adjacent to

¹⁴⁵ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage

¹⁴⁶ The Maintenance plan lists the frequency with which certain features should be monitored. Whilst weekly visits are required not all features may need to be assessed during each visit.

¹⁴⁷ A Figure showing site management issues marks a number of locations where improved signage is required. Of these locations priority should be given to: (1) signage of the walkway in Leith (there are no signs north of Sandport Place), (2) within Saughton Park (3) off Balgreen Road, (4) Redbraes Weir.

Action	Lead Agency & partners ¹⁴⁵	Targets
	Opportunity for volunteer involvement.	the river.
R12: Restrict approval for increased lighting on the walkway to avoid adverse impacts on bat feeding and to maintain rural character of parts of walkway (to be informed by landscape character assessment see Action L1 and requirements of ecological management plan (see Action B1) (A75).	CEC Development, CRS, WoLCT City CEC	No increase in lit areas in a) areas important for bat feeding; b) areas identified as of rural character in landscape character assessment.
R13: Create a unified “feel” for infrastructure linked to the Water of Leith (A72 , A76).	CEC CRS	All new seats to be in one style. N.B. refers to new and replacement features only; does not require the replacement of existing furniture that remains in good condition and fit for purpose.

REFERENCES

City of Edinburgh Council. 2003. Capitalising on Access – An Access Strategy for the City of Edinburgh 2003

City of Edinburgh Council. 2009. Edinburgh Open Space Strategy – Consultation Findings Transport, Infrastructure and Environment Committee 24 November 2009 http://cpol.edinburgh.gov.uk/getdoc_ext.asp?DocID=133362

ERM & Natural Capital. 2008. Core Paths Plan Produced for City of Edinburgh Council

Hardies, 2000. Water of Leith Millennium Project. Disabled Access Report. Produced for Water of Leith Conservation Trust.

SNH. 2002. Countryside access design guide. Developed by Scottish Natural Heritage with assistance and support from the Paths for All Partnership, the Scottish Countryside Access Network and The Fieldfare Trust. 2002 <http://www.snh.org.uk/publications/on-line/accessguide/index.asp>

W J Cairns & Associates. 2006. Edinburgh Public parks and Gardens Strategy. Prepared for City of Edinburgh Council.

9 EDUCATION AND INTERPRETATION

This topic paper reviews issues related to how information about the river is disseminated to members of the public and the use of the river for educational purposes.

9.1 Historical Context/current situation

Water of Leith Conservation Trust (WoLCT)

Three of the eight objectives of the Water of Leith Conservation Trust are directly linked to education and interpretation:

- Raising awareness of the river;
- Providing teaching and learning services for all age groups;
- Operating the Water of Leith Visitor Centre as an educational visitor attraction and community resource.

The Trust has developed a business plan for 2010 – 2013¹⁴⁸. A priority for the plan is to refresh the facilities and resources in the Visitor Centre, which are now ten-years old. It is the Trust's intention to assess the Visitor Centre interpretation using SNH and Scottish Interpretation Networks guidelines, and to seek funding in 2010-11 to upgrade this.

Education forms an important component of the Trust's work. The education services provided by the WoLCT are supported by the City of Edinburgh Children & Families Department through a seconded Environmental Education officer, 4 days a week. A curriculum-based Environmental Education and Expressive Arts programme is delivered to over 3500 children annually¹⁴⁸. The programme also looks at the importance of the industrial, built and social heritage of the Water of Leith. The diversity of the programme means that it can support "Curriculum for excellence" and community education units.

The Visitor Centre is used for individuals and a variety of groups. It is used as a meeting place, and has hosted cultural events such as art and photography exhibitions. Targets for 2010 – 13 are:

- to attract around 13,000 visitors to the centre, with 6000 of these visiting the exhibition;
- to deliver 7 river or walkway visits to community groups;
- to deliver a programme of 60 visits to community groups (30 youth, 10 OAP, 10 adult, 10 misc);
- to deliver 125 school group visits through the formal environmental education programmes reaching over 3000 children;
- to deliver 14 public events;
- to promote "biodiversity matters" education programme and fulfil awareness raising actions;
- to distribute 10,000 walkway leaflets and sell 1000 maps;
- support 4 community groups or projects to use the walkway (e.g. health walking groups, sponsored walks);
- to undertake 2 projects with the local media to promote use of the walkway.

¹⁴⁸ WoLCT, 2009

In addition the Centre organises a number of events for members of the Trust. This includes publication of a newsletter (*‘Under the Bridge’*), three times a year, and holding around 10 walks/talks for members.

A free leaflet describing the geological history of the river valley has been produced by the Trust, in association with Lothians & Borders RIGS group. A detailed map of the walkway from Balerno to Leith is available at a cost of 50p. This can be purchased from the WoLCT website. A basic map of the route can also be downloaded for free.

Interpretation Strategy

An interpretation plan was produced as part of the Millennium project¹⁴⁹. This included proposals for the Visitor Centre, and wider ranging initiatives. Some of the recommendations contained in that strategy have not been implemented. For example, it included a recommendation to label the Water of Leith where it crosses, or is crossed by, roads in the City. This recommendation has not been retained in this management plan as it is not considered to be a priority within the lifespan of this plan.

9.2 Objectives and actions

Aims & objectives: *To promote awareness and understanding of all aspects of the Water of Leith’s natural, built, cultural and historical heritage.*

Specific aims for education and interpretation are:

- To increase the number of ways and locations in which the public can obtain information about the Water of Leith.
- To provide high quality interpretation for the Water of Leith.
- To implement consistent branding on all materials linked to the Water of Leith walkway.
- To publicise existing information materials.

Rationale: The river provides many opportunities to contribute to the formal education curriculum, providing an accessible resource for experiencing wildlife, important landscapes, and cultural history. Greater knowledge and understanding of the river will aid in improved management of the walkway and river.

Actions to promote awareness and understanding of all aspects of the Water of Leith’s natural, built, cultural and historical heritage (Lead Agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A9).

Action	Lead Agency & partners¹⁵⁰	Targets
E1: Provide visits to community groups (A9).	WoLCT, CEC CRS	Targets to be set annually in WoLCT business plan & CEC CRS work programme.
E2: Provide guided walks along the	WoLCT, CEC CRS	Targets to be set annually

¹⁴⁹ James Carter and The Loft, 1999

¹⁵⁰ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

Action	Lead Agency & partners ¹⁵⁰	Targets
river (A10).		in WoLCT business plan and CEC CRS work programme.
E3: Provide education programmes linked to curriculum for excellence to school groups (A11).	WoLCT, CEC CRS	Targets to be set annually in WoLCT business plan and CEC CRS work programme.
E4: Provide support to community groups (A9).	WoLCT, CEC CRS	Targets to be set annually in WoLCT business plan & CEC CRS work programme.
E5: Identify opportunities to deliver joint education programmes with other groups to provide “added value” ¹⁵¹ (A41).	WoLCT, CEC CRS, PHRPRS, National Galleries of Scotland	One project per year.
E6: Seek funding to support the development of new interpretation materials. (A24)	WoLCT	Achieve funding for (at least) one interpretation project.
E7: Identify new “outreach” centres, which will provide information about the river ¹⁵² . (A36)	WoLCT, CEC Parks & Green Space, PHRPRS, National Galleries of Scotland. Links may be required with Forth Ports and private businesses along the river	Establish two outreach centres.
E8: Create an audio trail which can be downloaded from the internet. (A40)	WoLCT, CEC CRS (Discussion will be required with CEC Archaeologist)	Creation of trail that can be downloaded from website.
E9: Install orientation boards at key points ¹⁵³ (A49).	CEC CRS, WoLCT (Discussion will be required with CEC Archaeologist and other special interest groups to inform the information e.g. RIGS) Scope for private sponsorship	Installation of five boards (Balerno, Saughton Park, National Gallery of Scotland, Stockbridge, Leith).
E10: Provide free walkway maps to B&B and hotels near the route. (A70)	WoLCT, VisitScotland	Distribution of 100 leaflets.
E11: Publicise the Water of Leith in the	WoLCT	To be set on an annual

¹⁵¹ The Pentland Hills Regional Park Ranger Service also runs an educational programme. There is scope to create a collaborative programme on the theme of river catchments, or rivers from hills to the sea.

¹⁵² Possible locations are marked on the Site Management Issues Figure and include Saughton Winter Gardens, Gallery of Modern Art, and a site at Leith Docks

¹⁵³ Possible locations are marked on the Site Management Issues Figure and include: at start of walkway in Balerno, at the Visitor Centre in Slateford, in Saughton Park, in Roseburn Park, by the National Gallery of Modern Art, in Stockbridge, at Canonmills, and in Leith (near the Malmaison Hotel). There are other possible locations that can also be considered: Spylaw Park, Roseburn, Dean Village, St Mark’s Park.

Action	Lead Agency & partners ¹⁵⁰	Targets
media (A31).		basis as per WoLCT business plan.
E12: Include details about the Water of Leith in interpretation material produced for public parks (A30 , A36).	CEC Services for Communities (Parks & Green Spaces), WoLCT	Information to be included as boards are updated in the Parks (e.g. Saughton Park).
E13: Refresh the interpretation material within the Water of Leith Visitor Centre ¹⁵⁴ (A24).	WoLCT	Refresh of interpretative displays in Visitor Centre.
E14: Seek funding for interpretive materials (A24 , A42).	WoLCT	Secure funding.
E15: Produce information leaflets on “single themes ¹⁵⁵ ” (A69).	WoLCT, CEC Archaeologist	Production of 2 leaflets (wildlife & one on a cultural or archaeological theme e.g. water mills).
E16: Include details about the Water of Leith in interpretation commissioned for “Six Times”, the Anthony Gormley statues. (A30)	National Galleries of Scotland, WoLCT	Inclusion of information about the river in interpretation material.
E17: Existing signs that do not fit the “brown waterwheel” brand should be replaced ones that do (A72).	CEC CRS, WoLCT	Replacement of all signs not bearing “brown waterwheel” ¹⁵⁶ . This does not mean the wholesale replacement of all existing signs. All new signs that are introduced (either in new locations or as replacements for existing signs), then these should be of a consistent style. The historic cast iron signs should be maintained.
E18: Installation of additional signs (using the “brown waterwheel” logo (A50)).	CEC CRS, WoLCT	Installation of three new signs ¹⁵⁷ .
E19: Make copies of the brass rubbing trail available through the Water of Leith website (A32).	WoLCT	Trail available on website.
E20: Make copies of interpretation maps & materials available through relevant websites. (A33)	WoLCT	Information available through website.

¹⁵⁴ Existing exhibits, such as the practical demonstration of flooding and how sluice gates operate to control river flow should be retained.

¹⁵⁵ A leaflet on the geological history of the river valley exists. Appropriate themes would be “The mill heritage”, “wildlife” and “villages along the Water of Leith”. A locational map, which includes information about a range of features, already exists.

¹⁵⁶ Signage in Colinton & Craiglockhart Dell is a different style to that used along the walkway (wood signs), blue waymarker signs are used at other locations e.g. near Sandport Place. As a minimum, the Water of Leith logo could be added to these existing signs to retain continuity of the brand. A good example of this is the use of the national cycle route markers on existing signs.

¹⁵⁷ The Site Management Issues Figure marks a number of locations where improved signage is required. Of these locations priority should be given to: (1) signage of the walkway in Leith (there are no signs north of Sandport Place), (2) within Saughton Park (3) off Balgreen Road, (4) Redbraes Weir.

REFERENCES

James Carter and The Loft. 1999. The Water of Leith Millennium Walkway Interpretation Plan. Prepared for the Water of Leith Conservation Trust

Water of Leith Conservation Trust. 2008. The geology of the Water of Leith. Edinburgh & Lothians RIGS Group

Water of Leith Conservation Trust. 2009. Business Plan 2010-2013 – Draft December 2009

10 GEODIVERSITY

This topic paper reviews issues related to geological and earth science features and processes along and in the catchment area of the Water of Leith valley.

The term “geodiversity” or geological diversity is used to describe the variety of rocks, minerals, soils, sediments, landforms and associated processes. These features hold their own intrinsic value, as well as having an important role in influencing habitats and ecological features, and human use of an area.

10.1 Historical Context/Current situation

The geological history of the Water of Leith valley has been described by McAdam¹⁵⁸ and is summarised in a recent leaflet published by the Lothian & Borders RIGS Group¹⁵⁹. The influence of geology on the landscape of the river has been also been described¹⁶⁰. The following brief description is based on these accounts.

The geological history of the rocks in the Water of Leith catchment area is over four hundred million years old. The underlying rocks are typical of the Midland Valley, and originate from the Silurian, Devonian and Carboniferous times. The solid geology consists mainly of sedimentary rocks with a small area of igneous rocks east of Balerno. These are overlain by glacial deposits and alluvium. Three major fault lines cross the river at Juniper Green, Murrayfield and Balerno¹⁶⁰.

During the Silurian period the area was part of an ocean basin, which became filled with sediment. Fossils of marine life from that time (e.g. sea-lilies, corals, and shellfish) can be found in the sandstones and mudstones to the south of Threipmuir Reservoir¹⁵⁹. Later in the Silurian period these horizontal layers were forced upwards to form mountains with vertical strata by plate tectonic movements that occurred at the end of the period. Examples of these rocks are seen in the Bavelaw Inlier and North Esk Inlier¹⁵⁸.

The mountains were eroded to form level plains during the Devonian period. The coarse gravels or conglomerates found in the Pentland Hills were formed during the earlier Lower Devonian period. Volcanic eruptions resulted in the creation of hard rocks, resistant to weathering, which form the high ground of the northern Pentland Hills. Further movements in the Middle Devonian period resulted in the creation of the Pentland and Colinton Faults, and uplift, later to form the Pentland Hills. This was followed by the basal Carboniferous period, which had a wetter climate with the formation of large rivers. These deposited sands and muds that formed the red sandstone of the north-west and north flanks of the Pentland Hills.

By the middle of the Carboniferous period, dense forests and coastal plains had developed. Rivers discharging sediment to the sea developed deltas, which were colonised by mangrove-like swamps. These produced deposits of peat which became coal and raised land levels temporarily before becoming inundated by the sea, starting the cycle over again. These changing conditions have left a legacy of minerals, such as coal, sandstone, limestone, oil-shale and fireclay, which have been commercially exploited in the past. For example, Carboniferous sandstone was

¹⁵⁸ McAdam, 1984

¹⁵⁹ Water of Leith Conservation Trust, 2008

¹⁶⁰ Ironside Farrar, 1995

frequently used as the building material for the water mills along the Water of Leith¹⁶¹. Other rocks from this period are the cementstones, sandstones, siltstones, and mudstones, which underlie the Water of Leith basin south of the Murieston Faults.

In the Neogene period, the Drainage pattern of Scotland was initiated on an east-tilted planar surface, giving rise to major east-flowing rivers, such as the River Forth, with one of its consequent streams being the infant Water of Leith. The Great Ice Age, near the end of the Quaternary period (Pleistocene) further influenced the course of the modern river. Ice, which developed in the Southern Highlands, flowed eastwards across the Midland Valley and was deflected by the Pentland Hills. The ice gouged out the rocky landscape, creating ridges and hollows in an east-north-east direction, following the line of flow. The Water of Leith now flows through one of these hollows between Balerno and Colinton. Pebbles and boulders at the base of the glacier created striations in the rock, which are still visible. Debris from the glacier (known as glacial till or boulder clay) blocked the channel causing further diversions, for example, there is a 'buried channel' just south of Murrayfield¹⁶¹. Glacial till blankets the rocks on most of the low ground in the catchment basin.

Sea levels initially increased as a result of the final ice melt; sea levels in the Forth were about 35 metres higher than they are today¹⁶². The land then rose as the weight of ice was removed which has resulted in raised beach deposits covering ground below 35 metres. As the sea level fell, the Water of Leith eroded its valley and cut gorges and left river terraces as seen in Colinton Dell. Alluvium was deposited along most of the valley of the Water of Leith. A narrow strip of alluvium was deposited all along the upper reaches above Currie and in the broad plains where the river crossed the old Corstorphine Loch (near Murrayfield) and on the raised beach below Stockbridge.

Over the last 300 years the channel and hydrological process of the river have been modified by human activity, such as the construction of weirs, impoundment of the headwaters and development on the floodplain. In spite of this the Water of Leith remains geomorphologically active. Floods in April 2000 resulted in the development of new deposition features in the channel, such as gravel bars in the river near the Water of Leith Visitor Centre¹⁶¹.

10.2 Current management initiatives

Biodiversity Action Plan

Geological and earth science features are often managed in tandem with biodiversity resources. The City of Edinburgh Council is currently updating its Local Biodiversity Action Plan (LBAP)¹⁶³. For the first time this includes a section relating to geological features.

Sites considered to be of local importance for their geological features within the City can be designated "Local Geodiversity Sites" (LGS). These were previously called "Regionally Important Geological/Geomorphological Sites" (RIGGS). The suite of LGS is currently under review in conjunction with the Lothian & Borders RIGS Group.

The City of Edinburgh LBAP has set a series of objectives and actions for geodiversity. The objectives are to:

¹⁶¹ Lothian & Borders RIGS Group, 2008

¹⁶² McAdam, 1984

¹⁶³ City of Edinburgh Council, 2010

- Protect important geological and geomorphological sites and landforms;
- Raise awareness of geodiversity in Edinburgh, including its importance to biodiversity.

Five actions, for which funding has been secured, are identified by the plan, and are timetabled for completion by 2015:

- Identify and designate LGS;
- Promote the value of LGS and engage with partners in their protection;
- Monitor the condition of LGS;
- Promote the use of LGS for education and raise public awareness of local geodiversity;
- Develop skills and resources to support the work of the Lothian and Borders Regionally Important Geological Sites Group (LABRIGS).

There is also an action to seek funding for a Project Officer to develop the work of LABRIGS.

Work on identifying a suite of LGS is underway, and a short list of 27 sites has been identified. Potential sites include several along the river valley and many more within the catchment area. This will complement the existing RIGS in the area.

Promotion of geological features

A leaflet promoting the geological history of the Water of Leith has been produced by the Lothian and Borders RIGS Group and is available from the Group, the Water of Leith Visitor Centre¹⁶⁴ and the Hermitage of Braid Visitor Centre.

Geological and earth science features of interest are included in the many guided walks that are conducted by the Water of Leith Conservation Trust.

10.3 Objectives and actions

Aims & objectives: *To promote awareness and understanding of the geological history and features present along the Water of Leith Valley*

Specific objectives for geological features are:

- To include information about the geological history of the river at the Water of Leith Visitor Centre.
- To promote the existing RIGS geology leaflet.
- To include information about geological features in interpretive material for the river (covers all forms of media).

Rationale: The geology and land form of the Water of Leith has been central to its current development and character. For example, falling sea levels led to the creation of gorges, which have influenced the suitability of the river for water power and the subsequent development of mills and industry.

¹⁶⁴ Lothian & Borders RIGS, 2008

Actions to promote awareness and understanding of the geological history and features present along the Water of Leith Valley (Lead Agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A42).

Action	Lead Agency & partners ¹⁶⁵	Targets
G1: Include a panel/interactive display about geology in the refresh of interpretive material in the Water of Leith Visitor Centre. (A42)	WoLCT , Lothian & Borders RIGS	Installation of panel/display.
G2: Continue to make the RIGS leaflet available at the Water of Leith Visitor Centre and CEC CRS at Hermitage of Braid & monitor the number issued. (A16)	WoLCT , CEC CRS	Paper copies of the leaflet should always be on display and available to visitors.
G3: Make the RIGS geology leaflet available through the Water of Leith Conservation Trust website (A33).	WoLCT	Leaflet to be available to download/purchase via the website.
G4: Make copies of the RIGS geology leaflet available from other suitable outlets, such as Ranger Centres (Pentland Hills and City of Edinburgh Council) and the “outreach” centres (A36).	CEC CRS , PHRPRS, Lothian & Borders RIGS	Copies of leaflet to be constantly available through Ranger Visitor Centres and Outreach centres.
G5: Include information about geological features in guided walks (unless inappropriate to the theme of the talk). (A10)	WoLCT , CEC CRS	a) Initial target is at least one mention of geological features per walk. b) Targets to be reviewed annually in WoLCT business plan and CEC CRS work programme.
G6: Include information about geological features in fixed interpretive boards that are produced (A30, A36, A49).	CEC CRS , WoLCT , CEC Services for Communities (Parks & Green Spaces) , Lothian & Borders RIGS	Inclusion of geological features in all boards.
G7: Include mention of geological features in audio trails (A40).	WoLCT , RIGS	Preparation of one podcast that can be downloaded from website.

¹⁶⁵ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

REFERENCES

City of Edinburgh Council. 2010. Edinburgh Local Biodiversity Action Plan Phase 3 2010 – 2015

Ironside Farrar. 1995. Water of Leith Integrated Environmental Action Plan Landscape Resource Study. For Scottish Natural Heritage & Water of Leith Action Group.

Lothian and Borders RIGS Group. 2008. The geology of the Water of Leith, Edinburgh. Water of Leith Conservation Trust

McAdam, A. D. 1984. Geomorphology and Geology. Chapter in: The Water of Leith Ed. S. Jamieson, Water of Leith Project Group.

11 LANDSCAPE

This topic paper reviews issues related to the character and visual amenity of the Water of Leith and its landscape setting. It reviews pressures on landscape and newly emerging policy and legislation that will affect the landscape.

Landscape has been defined by the European Landscape Convention¹⁶⁶ as “*an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors*”. Thus the landscape of an area is the result of physical processes such as glaciation and river flow, topography, vegetation, and human use of the area. Visual aspects are concerned with the aesthetic appearance of the landscape itself as well as the features within it.

As landscape is influenced by the use of an area, landscape considerations overlap with various other topic papers in this plan, principally, [biodiversity](#), [archaeological, cultural and built heritage](#), [recreation and access](#) and [education and interpretation](#).

11.1 Historical Context/Current situation

Landscape Character Assessment (LCA) is the established decision-making tool used to define existing landscapes so that objectives can be set for their protection, management or future change. The character of the landscape can be defined as the recognisable pattern of geology, landform, soils, vegetation, land use and human settlement that occurs within a particular area.

The related practice of visual assessment is used to identify views within the landscape, explain the visibility of land or features, and describe the change in the appearance of the landscape that new development or land management may cause.

The character of the landscape through which the Water of Leith flows, from its source at Harperrig to its outlet at Leith Docks, is documented in three surveys conducted at different scales. An overview of each of these assessments is provided below, but the original texts should be consulted to obtain a more detailed understanding of the landscape character.

Lothians Landscape Character Assessment (1998)

The Lothians Landscape Character Assessment¹⁶⁷ considered the landscape within Lothian Region and was part of a national programme of regional landscape assessments commissioned by Scottish Natural Heritage (SNH). It defines the evolution of the Lothian landscape, including its hydrological systems. The study was conducted at 1:50,000 scale and excludes the urban area of the City of Edinburgh. It defines the River's setting to the west of Edinburgh as follows:

- Landscape Character Area ‘North-West Pentlands Fringe’ within the Landscape Character Type Upland Fringe’.
- Landscape Character Area ‘Lower Almond Farmland’ within the Landscape Character Type ‘Lowland Plains’.

¹⁶⁶ European Landscape Convention, 20.10.2000

¹⁶⁷ ASH Consulting Group, 1998

Edinburgh Landscape Character Assessment (2010)

This the most recent study, which was undertaken by Land Use Consultants and Carol Anderson in 2009¹⁶⁸. The assessment describes the character of the peri-urban environment and significant urban open spaces at 1:10,000 scale. The assessment does not describe areas of built form within the city. The report provides information to understand how to conserve, enhance or restructure the landscape of the City.

The landscape assessment² assigned areas into 14 “landscape character types”, which are defined on the basis of similarity in geology, landform, soils, vegetation, land use, field patterns, settlement and intervisibility, and 75 “landscape character areas”, which represent specific geographic locations where the landscape character areas occur. The upper reaches of the Water of Leith lie within the Pentland Hills – upper slopes and summits, and Pentland Flanks landscape character types. The key characteristics of the Pentlands Flanks character type include:

- Sloping hillside rising towards the Pentlands;
- Upland vegetation, with moorland pasture;
- Areas of forestry and woodland;
- Deeply incised burns and some wetland areas;
- Not highly prominent.

The landscape character areas relating to the Water of Leith lying within this landscape character type are:

- Cockburn geometric wooded farmland;
- Currie sloping wooded farmland;
- Leith plateau farmland;
- West Pentland fringe

For these areas, changes in agricultural practice are possible forces for change.

The lower reaches of the Water of Leith form landscape character areas in their own right where topography juxtaposed with built development dictates a clear change in character. The lower reaches of the Water of Leith are examples of the Incised River Valley landscape character type, which is characterised by:

- Steeply incised valley sides;
- Exposed rock outcrops in the river bed and valleys;
- Woodland associated with the valley;
- Legacy of weirs and mills;
- Secluded and intimate character;
- Settlement to the edge of the valley;
- Recreational routes along the river.

Three landscape character areas relating to the Water of Leith lie within this landscape character type:

- Water of Leith Colinton to Balerno;
- Water of Leith Slateford to Colinton Dell;
- Water of Leith New Town (from Wester Coates to Dean Terrace).

¹⁶⁸ Land Use Consultants & Carol Anderson, 2009a

The Water of Leith valley is an integral part of the new town of Edinburgh, and is flanked by the designed landscapes of Moray and Dean Gardens, which have sinuous paths down the steeply terraced valley sides. There are neo classical buildings at the top of the valley, and the Doric rotunda of St Bernard's well adds to the romantic nature of the landscape.

The assessment notes that the woodlands between Colinton to Balerno do not appear to be managed and that the presence of occasional derelict industrial sites gives an impression of poor condition. An absence of regeneration of woodland in the Slateford to Colinton Dell stretch is also noted. The presence of policy woodlands around Redhall House and Colinton House (now Merchiston Castle School) is still visible. Pressure to develop former industrial sites is seen as a force for change. By contrast the area in the New Town is considered to be generally well-managed.

Water of Leith Landscape Resource Study (1995)

A landscape resource survey of the whole of the Water of Leith Valley was carried out in 1995 by Ironside Farrar Ltd¹⁶⁹. This was an action from the 1993 Integrated Environmental Action Plan for the River¹⁷⁰.

The 1993 IEAP identified the need for a descriptive study of the Water of Leith to provide a baseline to evaluate landscape quality and assess future management proposals in terms of habitat, planning and recreation. It would also identify designed landscapes within the river valley.

The landscape resource survey identified nineteen character areas along the Water of Leith from Harperrig to the Forth Estuary. These were defined in terms of topography, vegetation and land use and correspond with broader sections of the river corridor defined more recently in the ELCA. Detailed written descriptions of each character area were provided, alongside annotated plans and illustrative photographs.

Whilst many of these descriptions are valid today, there have been some changes since they were produced. For example, the walkway is now complete along the full length of the river from Balerno to the sea, and there has been new development in a number of areas (e.g. housing has replaced Powderhall Stadium). The practice of landscape character assessment has also evolved over this period to take account of issues such as landscape capacity and sensitivity.

The descriptive study was used to prepare the basis for a strategy and guidelines for conservation and management of the landscape of the river corridor, co-ordinated with all aspects of the river's usage and environment. Many of the issues identified were common to more than one character area, and remain issues today. These are:

- The lack of promotion or recognition of the Water of Leith as a single, linked entity.
- Limited access to the river upstream of Balerno.
- Gaps in provision of signage (both in terms of providing directions and information about the route), and variation in the style and presentation of the signs that are present.

¹⁶⁹ Ironside Farrar, 1995

¹⁷⁰ Edwards-Jones, 1993

- The poor visual quality of surfaces and boundaries. A programme to improve the appearance of path surfaces, fences, walls, bridge parapets, seating and furniture was proposed. The commissioning of environmental artworks to create a strong identifiable corridor was also proposed.
- The need to ensure that new development does not impinge upon the river corridor.
- The need to carry out regular inspections and maintenance work on structures such as bridges, retaining walls, underpasses and tunnels, weirs, sluices and mill lades.
- The need to introduce a woodland management plan for all areas in public ownership, and provision of advice to private owners along the corridor.
- The need to control invasive species.
- The need to manage vegetation to improve its biodiversity and/or visual quality (e.g. grassland, tall herbs, ruderal communities, amenity planting).
- The need to manage litter and debris, including dog fouling.

In addition to the character assessments listed above, the landscape character and visual amenity of parts of the Water of Leith Valley was described in the Environmental Statement for the flood prevention works.

Landscape description for flood defence works

The baseline focussed on those areas of the river for which flood defence works were proposed, and considered the presence of riverside walls¹⁷¹. The walkway was described as a path that provides a variety of landscape experiences, ranging from sylvan valleys remote from their urban context to sections alongside industrial areas and residential estates.

The assessment focused on the presence of riverside walls in order to determine the likely impacts of new flood proposals. Existing riverside walls are present at several locations and fulfil a variety of functions including boundary definition and flood defence. These provide a context for new walls required as part of the flood defence scheme. By contrast, flood embankments are not a significant feature and would form a new landscape element. The importance of trees in the landscape was recognized for the following reasons:

- For the enclosure, shelter and interest that they provide for users of the Water of Leith walkway;
- For the screening of views from areas on one side of the river to areas on the opposite bank; and
- In providing settings for adjacent land uses.

A description of the landscape character of each area to be affected by the flood defence works was provided, together with an assessment of the effects of the scheme. Mitigation for landscape impacts for the scheme can be summarised as:

- Maintain as much as possible of the existing vegetation. This includes considering coppicing or pollarding trees rather than complete removal;
- Replanting using native species;
- Use of native seed mixes and aquatic plants.

Details of the flood defence scheme have been provided in the [Water](#) topic paper (see section 13)

¹⁷¹ Arup, 2003

Planning Policy

The Edinburgh City Local Plan and Rural West Edinburgh Local Plan contain a range of planning policies which share a landscape dimension and provide a framework of protection. Policies specific to the landscape such as local landscape designations, designed landscapes and tree protection are addressed below.

Local Landscape Designations

Areas of Great Landscape Value & Areas of Outstanding Landscape Quality

A landscape considered to be of regional or local importance for their scenic quality can be identified as either an Area of Great Landscape Value (AGLV) or Area of Outstanding Landscape Quality (AOLQ).

The Water of Leith, from Slateford to the Pentland Hills, lies within an Area of Great Landscape Value (AGLV). The purpose of this designation is to safeguard these areas from development likely to adversely affect landscape quality. AOLQ were derived from landscape assessment work conducted in the 1990s, and the area between Glenbrook and Balerno High School is identified as an AOLQ in the rural west plan¹⁷².

Scottish Natural Heritage (SNH) in association with Historic Scotland (HS) has published guidance for local authorities on local landscape designations,¹⁷³ which recommends a review of local landscape designations, including the replacement of AGLV by Special Landscape Areas (SLA).

Gardens and Designed Landscapes

Gardens and designed landscapes that are considered to be of national value are included in an *Inventory of Gardens and Designed Landscapes in Scotland*, which is maintained by Historic Scotland. The Inventory includes private gardens, parks, policies in country estates and botanical gardens. Sites are selected on the basis of their value as an individual work of art, historical value, architectural value, horticultural, arboricultural or silvicultural value, scenic value, nature conservation value, and (more recently), archaeological value.

Unlike monuments and buildings there is no primary legislation that gives protection to nationally important gardens and designed landscapes. Inventory status is not a statutory designation. However, under the *Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008* the effect of proposed development on a garden or designed landscape is a material consideration in the determination of a planning application.¹⁷⁴

Several sites adjacent to the Water of Leith are included on the Inventory, including the New Town Gardens, Botanic Gardens and Malleny House (see Table 11.1 and the Figure of environmental assets).

¹⁷² City of Edinburgh Council, 2006

¹⁷³ SNH & HS, 2004

¹⁷⁴ Peter McGowan Associates, 2009

Table 11.1: Gardens and Designed Landscapes listed on the National Inventory that occur adjacent to the Water of Leith

Site Name	Reasons for designation & comments ¹⁷⁵
Dean Cemetery	<p>An important example of a mid-19th century cemetery. Existing planting demonstrates the picturesque theories of landscape design applied to 19th century burial grounds.</p> <p>Values Work of Art: Outstanding Historical: Outstanding Horticultural: Some Architectural: Outstanding Scenic: Some Nature Conservation: High Archaeological: Some</p>
Malleny (Wester Lymphoy)	<p>The walled garden at Malleny contains an interesting old shrub rose collection planted in the 1960s. The woodland and gardens form an attractive setting for the category A listed house.</p> <p>Values Work of Art: High Historical: High Horticultural: High Architectural: Outstanding Scenic: Little Nature Conservation: Little</p>
Royal Botanic Garden Edinburgh	<p>The second oldest botanic garden in the UK hosts a vast plant collection and some interesting architectural features. The landscape is attractively laid out and enables vital research and conservation work to be carried out.</p> <p>Values Work of Art: Outstanding Historical: Outstanding Horticultural: Outstanding Architectural: Outstanding Scenic: Some Nature Conservation: Little</p>
The New Town Gardens	<p>The internationally recognised New Town Gardens comprise a series of 18th and 19th century town gardens, squares and walks. Although broadly contemporary with other developments in city planning, Edinburgh New Town has the most extensive system of public and private open space, designed to take full advantage of the topography and Edinburgh townscape.</p> <p>Values Work of Art: Outstanding Historical: Outstanding Horticultural: Some Architectural: Outstanding Scenic: Outstanding Nature Conservation: High Archaeological: High</p>

¹⁷⁵ Taken from <http://www.historic-scotland.gov.uk/index/heritage/gardens/gardenssearchsummary>

Tree Protection

General duty of planning authorities regarding trees

Scottish Ministers and the planning authority are to ensure, whenever it is appropriate, that in granting planning permission for any development adequate provision is made, by the imposition of conditions, for the preservation or planting of trees.

Tree Preservation Orders

Tree Preservation Orders (TPO) are made by a Planning Authority under Section 160 of the Town and Country Planning (Scotland) Act 1997. They are an effective means of protecting individual trees, groups of trees or woodlands which make a significant contribution to the local landscape or townscape and whose removal would have significant impact on the public amenity of an area. The Planning etc. (Scotland) Act 2006 extends these powers to include trees, groups of trees or woodlands of cultural or historical significance.

TPOs form a legal constraint permanently attached to the title of the land where the trees are located. An Order consists of a map showing the protected trees or woodland, and a written statement, detailing the species and groupings. It prohibits the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of trees except with the consent of the planning authority. Several TPO are in place along the Water of Leith valley (see the Figure of environmental assets).

Trees in Conservation Areas

The City's 38 Conservation Areas are defined under section 61 of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997, as areas of special architectural or historic interest where it is desirable to preserve or enhance their character or appearance (See [archaeology, cultural and built heritage](#) chapter). Established trees make a major contribution to their character and amenity. Under the Planning Acts, trees within these areas also have statutory protection. Before carrying out any tree work within a Conservation Area, the owner of the tree must give written notice to the Council detailing the nature and extent of the proposed work and identifying the trees. This allows the Arboricultural Officer to inspect the trees, discuss the work with the applicant, offer advice, and make recommendations.

The proposed work is also noted in a Public Register. The only way the Planning Authority can protect the trees is to promote a TPO; it cannot otherwise refuse consent. This will be done if the trees are of significant public amenity value and are considered to be at risk. After 42 days, if the Authority has not responded and if a TPO has not been served, the tree work specified may proceed. If the intended work does not proceed within two years the "notice of intent" will be deemed to have lapsed, and a further notification will be required. Provided the notification procedure has been followed there is no requirement to undertake replacement planting. Should work take place without notification, similar penalties apply as for trees protected by a TPO.

11.2 Current management initiatives

European Landscape Convention

The Convention was adopted by Europe in 2000 and became binding on the UK Government in March 2007. It promotes the protection, management and planning of European landscapes and facilitates European co-operation on landscape issues¹⁷⁶. It is concerned with the quality and management of all landscapes, not just sites identified as of

¹⁷⁶ Council of Europe Treaty Series No. 176

outstanding quality. Key elements are the need to recognise landscape in law, to develop landscape policies dedicated to the protection, management and creation of landscapes, and to establish procedures for public participation in the development of landscape policy. It complements the Council of Europe's and UNESCO's heritage conventions.¹⁷⁷

Special Landscape Areas (SLA)

Special Landscape Areas (SLA) are the proposed replacement for AGLV and AOLQ.¹⁷⁸ These will be identified by reference to guidance prepared by SNH in association with HS¹⁷⁸.

The guidance promotes recognition of "whole landscapes", and the inter-relationship between landscapes that are important both for their scenic qualities and historical context. It recognises the roles that designated areas can continue to play within the wider landscape; acting as accolades, which recognise the special importance of an area; as a means to identify policies and objectives; and as a tool for management (e.g. to promote improvements in quality).

In 2010 The City of Edinburgh Council approved a Review of Local Landscape Designations. This identifies 22 candidate Special Landscape Areas (cSLAs) to be considered for future designation when the Local Development Plan (LDP) is prepared. The LDP will also be the process through which existing AGLV and AOLQ are modified as part of Special Landscape Areas or de-designated. The cSLAs will form a material consideration in the determination of planning applications in the interim.

Candidate SLAs were evaluated for their relative landscape value from the baseline units of terrain mapped in the Edinburgh Landscape Character Assessment. The review includes proposals to designate several sections of the Water of Leith as cSLAs including the "Water of Leith – west" candidate SLA. This includes the Water of Leith Colinton to Balerno and Water of Leith Slateford to Colinton Dell landscape character areas; The 'Water of Leith – New Town' cSLA extends from Roseburn to Stockbridge. The Pentlands candidate SLA, includes two landscape character areas to which the Water of Leith contributes (Cockburn geometric wooded farmland, 37, Currie sloping wooded farmland 34).

If designated, the SLAs would extend landscape protection to additional sections of the Water of Leith and its setting. In addition, the Review identifies the need for planning policy to refer also to landscape character and the Edinburgh Landscape Character Assessment.

Support for the concept of attention for all landscapes, both urban and rural, is provided by Scottish Natural Heritage's policy statement on landscape. There is also support for partnership working to tackle local issues of landscape degradation¹⁷⁹.

Gardens and Designed Landscapes

Scottish Historic Environment Policy (SHEP)¹⁸⁰ encourages planning authorities to develop policies within their development plans for the identification and future management of designed landscapes which do not meet the criteria set for national importance but which make an important contribution to the local historic environment and landscape character of the area.

¹⁷⁷ http://www.coe.int/t/dg4/cultureheritage/heritage/landscape/presentation_en.asp

¹⁷⁸ SNH & HS, 2004

¹⁷⁹ Scottish Natural Heritage, 2005. Statement SNH's LANDSCAPE POLICY FRAMEWORK Policy Statement No. 05/01

¹⁸⁰ Scottish Historic Environment Policy (SHEP) SPP23 Planning and the historic environment

The City of Edinburgh Council commissioned Peter McGowan associates to undertake a broad search of all potential sites of value, through desk based research of historic maps and published sources¹⁸¹. This stage one research produced a long list of 312 sites, including several alongside the Water of Leith corridor. The second and ongoing stage of the project is to document and research these sites in more detail. To date some 48 sites have been assessed and their designed landscape value recorded.

An Edinburgh Planning Guideline approved in 2010 advises on good practise when considering development or alterations to gardens and designed landscapes. Should proposed development affect a site identified in the stage one list, an applicant may be requested to provide a historic landscape assessment of the site and to identify how any changes proposed could be accommodated.

To date, three sites situated adjacent to the Water of Leith have undergone a stage two survey. A number of other sites from the long-list, adjacent to the river remain to be surveyed in detail.

Table 11.2: Site which have been documented and researched.

Site Code	Name	Description ¹⁸²
068	Warriston Crematorium	The site of an estate landscape, East Warriston, with a long history and current house built in 1808 that was adapted for use as a privately run crematorium in the 1920s and remains in this use today, with many of the estate buildings, boundary walls and structure planting surviving either in the crematorium or in allotments to the south.
065	Warriston Cemetery	The earliest of several 19th century 'garden' cemeteries that contribute to the urban form of the inner suburbs and to the amenity of the neighbouring streets, with significant values in terms of architectural features and memorials to prominent citizens. Dalry and Newington cemeteries are also included in the priority sites surveyed in 2007-08. The early 20th century extension and continued use makes Warriston different to the other sites.
079	Malleny Park (Wester Lymphoy / Lymphoy)	Malleny Park contributes to the rural setting of the village of Balerno and to the visual separation between the neighbouring villages of Currie and Balerno. The park is also part of the <i>essential setting</i> for the neighbouring Malleny House and its gardens. The mature riverside woodlands are an important part of the green corridor that follows the course of the Water of Leith. (Part of the site is also listed on the National Inventory of Gardens & Designed Landscapes)

¹⁸¹ Peter McGowan Associates, landscape architects with Christopher Dingwall garden historian, 2009

¹⁸² Taken from Peter McGowan Associates, 2009

Other projects and initiatives

Flood Defence Works

Details of the flood defence scheme have been provided in the [Water](#) topic paper (see section 13) and comments on likely impacts on landscape and mitigation were provided above. The Environmental Action Plan for the works includes several measures to reduce the visual impact of the scheme.

Public Art Works

The National Galleries of Scotland has commissioned Antony Gormley to produce “Six Times”, which comprises six life-size human statues that will be installed at locations along the Water of Leith between the Galleries at Belford to the Docks at Leith¹⁸³. The statues will be installed during 2010 and the installation period has been timed to avoid trout spawning. Method statements that will avoid pollution of the river will also be produced and approved by Scottish Natural Heritage prior to installation.

11.3 Objectives and actions

Aims & objectives: *To safeguard and enhance the landscape character and visual amenity of the setting of the Water of Leith.*

Specific objectives for landscape are:

- To understand the existing landscape character of the Water of Leith and its capacity to accommodate development.
- To progress surveys of gardens and designed landscapes along the Water of Leith which make an important contribution to the local historic environment and landscape character.
- To ensure that landscape mitigation measures included in Environmental Action Plan for the flood defence works are fully implemented¹⁸⁴.

Rationale: The landscape character of the river valley has been described, both as a feature in its own right and how it relates to the wider landscape of the City of Edinburgh. There are extensive stretches that retain an undeveloped character and provide a semi-natural corridor running through the centre of Scotland’s capital city. The historical use and development of the city around its river is also evident in the landscape, from the relics of mills and associated mill lades, disused railway lines, and designed landscapes and features such as St Bernard’s Well. The quality of some of these areas has been recognised through their identification as features of national, regional or local importance (e.g. included on the inventory of Gardens and Designed Landscapes or local landscape designations). But not all of the river landscape currently reflects its potential and opportunities exist to enhance its setting and recreational value. There are some areas where existing development does not positively address the river corridor and walkway. Equally, redevelopment of land benefiting from a river valley location, presents challenges in terms of the ability of the landscape to accommodate change without unacceptable effects on its character.

Issues relating to local landscape quality were first highlighted during a landscape survey of the river in the 1990s, and some of these remain relevant today. Others are dealt with in other topic papers. For example, issues related to the quality and location of signage, and control of litter and debris are considered in the access and recreation topic paper, whilst

¹⁸³ National Galleries of Scotland, undated

¹⁸⁴ Arup, 2006

issues related to woodland management, control of invasive species, and management of vegetation are considered in the biodiversity topic paper.

Actions to safeguard and enhance the landscape character and visual amenity of the setting of the Water of Leith (Lead Agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A37).

Action	Lead Agency & partners ¹⁸⁵	Targets
L1: Revise the 1995 Water of Leith Landscape Resource Study to provide an updated base line with which to monitor landscape change and provide information to inform consultation response. (A37)	CEC City Development - Planning, WoLCT.	a) Completion of survey.
L2; Progress detailed surveys of gardens and designed landscapes, which lie on the Water of Leith corridor or within its immediate visual envelope (A38).	CEC City Development - Planning	Completion of surveys.
L3: To implement landscape and visual mitigation measures included in the Environmental Action Plan for the Flood Defence Works. (A29)	CEC City Development – Structures & Flooding, WoLCT	Targets are set in the Environmental Action Plan.

¹⁸⁵ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

REFERENCES

- ASH Consulting Group. 1998. The Lothians landscape character assessment. Scottish Natural Heritage Review No. 91
- APRS. 2000. Mapping Tranquillity in Scotland (Inverness to Aberdeen): concept, methodology and potential, Association for the Protection of Rural Scotland, Edinburgh.
- Arup, 2003. Water of Leith Flood Prevention Scheme: Environmental Statement Volume 1: Text. November 2003 for City of Edinburgh Council
- Bell, S. 1999. Tranquillity Mapping as an Aid to Forest Planning March 1999, Forestry Commission, Edinburgh
- City of Edinburgh Council. 2006. Rural West Edinburgh Local Plan
- City of Edinburgh Council. 2009. Review of local landscape designations. Report for Planning Committee. 14 May 2009
- CPRE and the Countryside Commission. 1995. *Tranquil Areas – England Map*
- Edwards – Jones, E. 1993. The Water of Leith Integrated Environmental Action Plan. Scottish Wildlife Trust.
- Ironside Farrar. 1995. Water of Leith Integrated Environmental Action Plan. Landscape Resource Study. Scottish Natural Heritage & Water of Leith Action Group.
- Jackson, S., Fuller, D., Dunsford, H., Mowbray, R., Hext, S., MacFarlane R. and Haggett, C. (2008). *Tranquillity Mapping: developing a robust methodology for planning support*, Report to the Campaign to Protect Rural England, Centre for Environmental & Spatial Analysis, Northumbria University, Bluespace environments and the University of Newcastle upon Tyne.
- Land Use Consultants & Carol Anderson. 2009a. Edinburgh Landscape Character Assessment. Draft Report. March 2009. Report to City of Edinburgh Council.
- Land Use Consultants & Carol Anderson. 2009b. Edinburgh Local Landscape Designation Review. Interim Report. March 2009. Report to City of Edinburgh Council.
- National Galleries of Scotland. Undated. "Six Times" information to support a planning application
- Peter McGowan Associates & Christopher Dingwall. 2009. Edinburgh Survey of Gardens and Designed Landscapes. April 2009
- Rendel, S. 1996. 'A Tranquil Countryside?' Countryside Recreation News March 1996, 9-11.
- Scottish Natural Heritage and Historic Scotland. 2004. Guidance on local landscape designations. SNH, Battleby, Perth.

12 PLANNING

This topic paper reviews issues related to planning for development and use along the Water of Leith. It focuses upon land within the jurisdiction of the City of Edinburgh Council and covers the whole of the Water of Leith walkway from Balerno to the Victoria Swing Bridge.

12.1 Historical Context/Current situation

Development is guided through the development plan, which comprises separate elements dealing with different geographic scales and levels of detail. The structure plan addresses land use issues that cross local authority boundaries and strategic infrastructure. These are supported by local plans, which provide detailed policies that guide most day-to-day decision making. Planning legislation states that decisions on planning applications and other planning matters should: 'be made in accordance with the development plan unless material considerations indicate otherwise' (*Section 25 and 37(2) of the Town and Country Planning (Scotland) Act 1997*).

The Council currently has two local plans, the Edinburgh City Local Plan and the Rural West Edinburgh Local Plan, which sit within the Edinburgh and Lothians Structure Plan 2015 and make up the development plan for their respective areas¹⁸⁶.

Local plans are expected to be consistent with national planning policy and advice issued by the Scottish Government. A range of national documents are of relevance to Local Plans, including Scottish Planning Policy (SPP), Planning Advice Notes (PANs), Designing Places and Scottish Historic Environment Policy (SHEP).

The Local Plans are supplemented by a range of guidance covering individual topics, including the Edinburgh Standards setting out the Council's expectations on the issues of design, housing, sustainable building and streets. Supplementary planning guidance for individual sites (development briefs) and for wider areas in the form of development frameworks and master plans can also be produced. There is a development brief for the Bonnington area of Edinburgh, which includes policies relevant to the Water of Leith. Such guidance, whilst not statutory in nature, may be a material consideration.

Planning authorities also have powers to promote enhancement of features through planning agreements to accompany planning permission.

Structure plan

The Edinburgh and the Lothians Structure Plan 2015 was prepared jointly by the City Council with the councils for East, Mid- and West Lothian. It was approved by the Scottish Ministers in 2007. It provides guidance on the scale and distribution of development that should be accommodated in local plans.

Although the Water of Leith is not specifically mentioned in the plan, it includes a number of policies that deal with issues pertinent to the management of the river, including protection of sites of international and national importance for natural, historical and built features, protection of scenic areas and green belt, requirements for good design, and consideration of flooding issues (See Table 12.1).

¹⁸⁶ CEC Planning webpage

http://www.edinburgh.gov.uk/internet/Environment/Planning_buildings_i_i_/Planning_hidden/Local_plans/CEC_city_of_edinburgh_local_plans

Local plans

Two local plans cover the area of the Water of Leith Walkway: the Edinburgh City Local Plan and the Rural West Edinburgh Local Plan.

Edinburgh City Local Plan

This was adopted by the Council on 28 January 2010 and replaced five older plans.

The purpose of the local plan is to:

- Provide a clear basis for determining planning applications;
- Allocate land to meet needs and targets set out in the structure plan;
- Provide a clear framework for regeneration strategies prepared by the council, other public sector agencies and developers;
- Provide support for wider strategies of the council particularly the local transport strategy, and help infrastructure providers to plan for the future¹⁸⁷.

It is also designed to enable the Council to meet a number of objectives, including protecting the built and natural heritage of the city and having special regard for the impact of new development on the World Heritage Site¹⁸⁷. A stated key role for the Plan is to integrate conservation policies into the wider policy framework, and promote development which will care for the historic environment and the natural heritage, mitigate adverse impacts and contribute towards restoration and enhancement.

The plan contains many policies linked to the protection and enhancement of natural and built resources. A summary of the main ones which may guide development near the Water of Leith is provided in Table 12.1. Only one policy, Des 9¹⁸⁸, makes specific reference to the Water of Leith, and provides guidance on criteria for development adjacent to the river. The supporting text places an emphasis on the secluded and tranquil nature of the walkway and notes that development needs to enhance the watercourse “preserving and enhancing tranquil and semi-rural character”¹⁸⁸. Several of the other policies also influence the river. For example, those areas that are designated as of national or local importance for natural heritage, landscape quality, or built heritage features are protected against certain types of development by various policies¹⁸⁹, this includes Tree Preservation Orders; open spaces are also protected in certain circumstances. This means that there are several policies present that can be used to help safeguard the Water of Leith.

Leith Waterfront is identified by the plan as an area that can accommodate development. Additional policies for development within this area are included within the plan. This includes an aspiration to create a coastal path around the outer edge of the site, and to extend the Water of Leith Walkway from the Shore out to the Martello Tower.

The role of the City of Edinburgh Council in providing funding support for the Water of Leith Conservation Trust and the World Heritage Trust is also noted.

¹⁸⁷ City of Edinburgh Council, 2009

¹⁸⁸ Policy Des 9 Waterside Development: Development on sites on the coastal edge and development on sites adjoining a watercourse, including the Union Canal, will only be permitted where the proposal: a) provides an attractive frontage to the water in question; b) maintains or provides public access to the water's edge; c) maintains and enhances the nature conservation interest or landscape; interest of the water body including its margins; d) if appropriate, promotes recreational use of the water.

¹⁸⁹ E.G. Env 11 provides protection for Areas of Great Landscape Value, Env 7 provides protection for Historic Gardens and Designed Landscapes; DES 8 provides protection for the Green Belt; Env 15 provides protection for sites of local importance for natural heritage

Rural West Edinburgh Local Plan

This was adopted by the Council in 2006. It replaced three existing local plans. An Alteration is in preparation but this does not relate to the Water of Leith (see below).

The aim of this local plan is to implement the strategy of the Edinburgh and the Lothians Structure Plan 2015 which seeks to restrain growth in Rural West Edinburgh and to protect and improve the Green Belt, while providing for Lothian's development needs in more sustainable locations elsewhere.

Like the Edinburgh City Local Plan, it includes several policies that deal with issues relevant (but not specific) to the Water of Leith (See Table 12.1). It also includes a policy (E26) to protect and improve rights of way and walkways, and states that the banks of the Water of Leith and Bavelaw Burn should be safeguarded for continuing recreational use. Policy E27¹⁹⁰ is specific to the Water of Leith and promotes continuous access along the banks of the river, protection of its landscape and rural quality, and management of the wildlife corridor.

Bonnington Development Brief

The Council may publish supplementary planning guidance for complex sites. Such guidance, known as a Development Brief, has been published for the Bonnington area of Edinburgh¹⁹¹.

The guidance is primarily concerned with development un-related to business, industry and storage, and has the objective of guiding an appropriate mix of uses. However, it includes reference to the Water of Leith and includes objectives to

- “Establish an attractive and safe pedestrian/cycle route along likely desire lines to connect the walkways and cycle paths along the disused railway and Water of Leith to Bonnington Road and Pilrig Park; and
- Enhance the setting of the Water of Leith and improve the walkway.”

Recommendations for diverting and enhancing the current route of the Water of Leith walkway are included. Design criteria for new developments along the Water of Leith are also stated:

- “New development should preserve the natural environment and enhance its role as a green corridor and pedestrian walkway.
- Development should maintain the existing character of the riverside which is predominately soft and vegetated, except between Anderson Place and West Bowling Green Street where the river banks are formed by retaining walls.
- The area of green space adjoining the river at the John Lewis Partnership should be reshaped and defined as an area of publicly accessible open space.”

Support for the introduction of interpretation boards is also stated.

¹⁹⁰ Policy E27 - River Almond, Water of Leith and their Tributaries: The following measures for the protection and enhancement of the recreational potential of the River Almond, Water of Leith and their tributaries will be encouraged and supported: 1. the completion of continuous walkway/cycle routes along their banks, where appropriate, and the establishment of footpath links with adjacent sites; 2. the completion of a walkway/cycle route along the River Almond between Craigiehall/Cammo and the Queensferry/ Kirkliston walkway/cycle route; 3. protection of their exceptional landscape qualities and rural character, and improvement of degraded sites adjacent to the River Almond between the airport and Newbridge; and 4. the sensitive management of their banks and defined valleys to consolidate and enhance their value as wildlife corridors.

¹⁹¹ City of Edinburgh Council, 2008

Leith Docks Development Framework

The Leith Docks Development Framework sets out a long-term vision and framework for the redevelopment of Leith Docks in Edinburgh. It has been prepared in initial form by consultants for Forth Ports plc within a context set by the Council, and subsequently edited by the Council prior to and following a public consultation process. It was approved by the Council as supplementary planning guidance on 10 February 2005.

The Development Framework area extends to 172 ha, most of which is outside the scope of this plan, but does include the Water of Leith (and surrounding land) downstream of Commercial Street. It includes planning principles for urban landscapes, including specific provision for the incorporation of heritage features within development proposals. It also supports non-vehicle access and includes proposals for new access routes, that could be extensions or, or linked into, the existing Water of Leith Walkway. The Development Framework also provides opportunities for public open space and public art works, which would provide synergy with several of the proposals contained in this plan.

Planning Agreements

Development proposals can have diverse and wide ranging impacts. If these cannot be addressed through planning conditions, the Council may negotiate the provision of developer contributions, which are usually financial but may be 'in kind', as part of the process of considering and approving a planning application. This can include provision of new open space or the improvement of existing areas.

12.2 Current management initiatives

Changes to the planning system

There have been a number of changes to the planning system, which will alter the format of planning policies.

The structure plan is being replaced by a strategic development plan. This covers a wider area than the structure plan, and includes the Scottish Borders and parts of Fife. It is being prepared by the new Edinburgh and South East Scotland Strategic Development Planning Authority; comprising City of Edinburgh, East Lothian, Midlothian, Fife, Scottish Borders and West Lothian Councils (SESplan).

Both existing local plans will be replaced by a single local development plan, covering the whole of the Council area. Preparation of this plan will follow close behind preparation of the strategic development plan.

Planning applications

There are a number of locations along the river, particularly in its upper reaches, where there is potential for development. For example, there is planning permission for new flats on the old East Mills Nursery site in Currie. The site of the old Kinleith Mills is also an important development site. There is also a current planning application to install a new boom to help in litter collection on the river at Leith.

Policy Initiatives

A number of policy initiatives are being implemented by the Council. Some of these e.g. relating to access and footpaths, and identification of Special Landscape Areas are discussed in other topic papers.

Central Scotland Green Network (CSGN)

The CSGN was officially launched on 30 September 2009. Its formation has been confirmed as one of 14 National Developments in the 2nd National Planning Framework published in June 2009¹⁹². The objective is to transform the central belt of Scotland into a more attractive place. This will include a significant increase in woodland cover, restoration of vacant and derelict land, improved networks for cycling and walking, and building a strategic network of priority habitats for biodiversity.

The CSGN is designed to achieve collaborative working to promote enhancement of green spaces in order to promote healthier lifestyles, better environments, greater diversity, stronger communities and economic opportunity. The concept of 'added value' is at the core of the CSGN. A work programme is currently being developed. Assets such as the Water of Leith Walkway will contribute to the network.

Open Space Strategy

A city-wide open space strategy is being prepared for Edinburgh, in response to the requirements of national planning policy. The policy requires the creation of an audit, a strategy and action plans. The strategy aims to ensure that a coordinated approach is taken to protecting and developing the city's network of open space. It will set the standards that the Council will be expected to meet. The open space strategy itself is currently under preparation and this will be accompanied by action plans prepared in participation with the 12 Neighbourhood Partnerships in Edinburgh. The draft strategy was approved in February 2010 and will be subject to public consultation. Once finalised, the audit, strategy and action plans will be used to inform planning decisions on loss of open space and provision in new development; and to inform investment and site-management decisions by the Council and potentially other organisations responsible for open spaces.

Whilst the integrity of the river is given some recognition in the Open Space Strategy, the document also deals with it on a Neighbourhood Partnership Area basis for management and consultation reasons. It includes the objective of creating connections to the linear walkways of the Water of Leith (and Union Canal) where the opportunity arises.

12.3 Objectives and actions

Aims & objectives: *To create a planning framework that will safeguard the special qualities of the Water of Leith including its integrity, tranquillity, amenity, historical, landscape and natural heritage value.*

Objectives specific to planning policy are:

- To support and implement current policies to safeguard the special qualities of the Water of Leith.
- To develop new policies and initiatives that will further safeguard the special qualities of the Water of Leith.
- To provide support for, and collaborate with, organisations and groups that are involved in managing and safeguarding the Water of Leith.

Rationale: The Water of Leith is an important resource to the City, in terms of its natural, cultural and built heritage, amenity and landscape quality. It also provides a "sense of place" and a haven of tranquillity. It contributes to the achievement of policy initiatives such as the

¹⁹² Scottish Government, 2009

Core Path Network, open space strategy and Local Biodiversity Plan. It also performs “services” for the City, such as carrying excess rainfall.

The river currently has a mosaic of more open, undeveloped areas, and parts that are densely developed and more enclosed. Part of the value of the river is its continuity and opportunities for off road travel from its upper reaches to the sea. The corridor is currently covered by two separate local plans. The new local development plan providing coverage for the whole of the city, will provide a planning context for the river as a whole. The integrity of the river is given some recognition through existing document/plans (e.g. Open Space Strategy & Core Path Plan). Proposed actions are therefore focussed on monitoring the success of existing policies in safeguarding the special nature of the Water of Leith.

Actions that will safeguard the special qualities of the Water of Leith including its integrity, tranquillity, amenity, historical, landscape and natural heritage value. (Lead Agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A2).

Action	Lead Agency & partners ¹⁹³	Targets
P1: Monitor the implementation of relevant policies in existing local plans (specifically those relating to Waterside development as applied to the Water of Leith). Monitoring should focus on how policies have been applied to decisions, and how these have been implemented on the ground. (A2)	CEC Development City	Completed and approved development to be monitored in terms of relevant policies.
P2: Policy initiatives that promote and safeguard the Water of Leith as an important landscape, amenity, historical and natural heritage asset should be supported (e.g. Central Scotland Green Network). (A3)	CEC Development, City	a) Identification of all wider policy initiatives relevant to the Water of Leith. b) Participation in at least 2 policy initiatives.
P3: Update the existing landscape character assessment for the Water of Leith to provide a current baseline and capacity study upon which to monitor landscape change and assess new development or management proposals. (A37).	CEC Development Planning, WoLCT City -	a) Completion of survey. b) identification of capacity to change. c) Identification of design guidance. d) Identification of planning policies (if required).
P4: Continue to work in partnership and provide support for the Water of Leith Conservation Trust, Edinburgh World Heritage Trust & the Honorary Bailiffs (A4).	CEC (various departments)	Ongoing.

¹⁹³ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

REFERENCES

City of Edinburgh Council. 2008. Bonnington Development Brief. August 2008

City of Edinburgh Council. 2009. Edinburgh City Local Plan Written Statement (adopted) (incorporating advertised modifications and minor technical and drafting amendments) December 2009

Scottish Government. 2009. Second National Planning Framework. HMSO

Table 12.1 Summary of key policies within Structure and Local Plans that may impact upon the Water of Leith

Structure Plan Policy		Edinburgh City Local Plan Policy		Rural West Local Plan Policy	
ENV1 C	International and National Historic or Built Environment Designations: Protects features designated as of international and national importance for their historic or built heritage value from harmful development	Env 1	World Heritage Site: provides protection against development detrimental to the qualities that led to the site's designation.		
		Env 2	Listed Buildings – Demolition: sets out the exceptional circumstances when demolition of a listed building will be consented.	E32	Listed Buildings: defines criteria for development affecting listed buildings.
		Env 3	Listed Buildings – Setting: defines criteria for development that will affect the setting of a listed building.	E33	Listed Buildings –Uses: defines criteria for use of buildings.
		Env 4	Listed Buildings – Alterations and Extensions: defines criteria that must be met to allow alterations & extensions.	E34	Listed Buildings – Uses: protection of the setting of buildings.
		Env 8	Protection of Important Remains: provides protection for Scheduled Ancient Monuments and other remains of national importance.	E29	Scheduled Ancient Monuments: Protects these against development.
ENV 1 D	Regional and Local Natural And Built Environment Interests: Protects areas of regional or local value for natural, cultural and built heritage interest from harmful development	Env 5	Conservation Areas – Demolition of Buildings: defines criteria that must be met to allow demolition	E35	Conservation Areas – General: protection of area and definition of criteria to be met for development to be permitted.
		Env 6	Conservation Areas – Development: defines criteria to be met for new developments.		
		Env 9	Development of Sites of Archaeological Significance: defines criteria for new	E30	Non-Scheduled Archaeological Remains – Archaeological

Structure Plan Policy		Edinburgh City Local Plan Policy		Rural West Local Plan Policy	
			developments in areas of known or suspected archaeological importance.		Evaluation: requirement for investigation prior to development in areas likely to hold features of interest.
				E31	Archaeology – Management, Education and Awareness: promotion of access to sites and provision of interpretive material.
ENV 1 E	Features of Local Importance: Requires identification of features of local biodiversity importance and policies for their protection/enhancement	Env 15	Sites of Local Importance: provides protection for sites of local importance for flora, fauna, landscape or geology.	E18	Nature Conservation – Sites of Importance for Nature Conservation: protection from development.
				E19	Nature Conservation – Management: promotes positive management of habitats in SINCS, and land in Council ownership.
ENV 1 F	Environmental or Biodiversity Assessments: Requires assessment of development that will affect designated and important non-statutory biodiversity sites and protected species.	Env 16	Species Protection: defines criteria for protection of species within developments.	E20	Nature Conservation – Development Impact: promotion of biodiversity within development proposals.
				E22	Nature Conservation – Protected Species: Protection of species during development.
ENV 1G	Design of New Development: To promote high quality of design	Des 1 - 12	Design Principles: Policies relating to different aspects of design are included.		

Structure Plan Policy		Edinburgh City Local Plan Policy	Rural West Local Plan Policy		
			A development quality handbook that details design criteria has been produced.		
ENV 2	Green Belt: to maintain a green belt around Edinburgh	DES 8	Urban Edge Development: Sets out conditions under which development at the urban edge will be allowed, which includes promotion of landscape, amenity and biodiversity uses	E5	Development in Green Belt and Countryside Areas:
		Env 10	Green Belt: Sets criteria for when development in Green Belt will be permitted.	E6	Design and Amenity Criteria for development in the Green Belt and Countryside
ENV 4	Landscape: Consideration of landscape designations	Env 7	Historic Gardens and Designed Landscapes: Protects these from harmful development and supports their restoration.	E14	Designed Landscapes: Provides protection and defines criteria under which development will be permitted.
		Env 11	Landscape Quality: provides protection for Areas of Great Landscape Value	E8	Areas of Great Landscape Value and Areas of Outstanding Landscape Quality: Provides protection and defines criteria under which development will be permitted...
		Env 12	Trees: Provides for protection of trees, including those identified by Tree Preservation Orders.	E15	Protection and Enhancement of Trees and Woodland: Provides for their retention during construction.
				E16	Trees – Development Impact: Defines criteria for

Structure Plan Policy		Edinburgh City Local Plan Policy		Rural West Local Plan Policy	
					designation of Tree Preservation Orders and the protection of trees.
ENV 12	Water Management and Flooding: Requires consideration of flooding risk, policies relating to flooding and use of sustainable draining systems.	Env 17	Flood Protection: defines criteria to be met to demonstrate that developments will not affect flood risk. A separate policy relates to the use of sustainable urban drainage systems.	E45	Flooding: sets out criteria that must be met to avoid increasing flooding risk.
		Des 9	Waterside development: Sets out criteria for development next to watercourses (and coastal edge)		
		Os 1	Open Space Protection: defines criteria for the protection of open spaces in development proposals.	E51	Protection of Open Space: defines criteria for the protection of open spaces.
		Os 3	Open Space in New Development: Encourages the provision of new public space in new developments, including promoting the opportunity to extend the network of green corridors.		

13 WATER

This topic paper reviews issues related to the water itself including its quality, quantity and how normal and peak flows are managed (including proposed flood defence works).

13.1 Historical Context

The source of the Water of Leith is at the Colzium springs on the North side of the Pentland Hills. Around 200 of these springs were tapped in 1843, which led to the construction of Harperrig Reservoir on the river¹⁹⁴ to provide compensation flows to Mill Owners along the Water of Leith. The river drains the north western slopes of the Pentland Hills and has a catchment area of 117km² and the total length of the main stream is 31.7km¹⁹⁵. It has a number of tributaries, of which the most significant is the Bavelaw Burn, which drains Threipmuir and Harlaw Reservoirs.

Around 70% of the catchment is rural, with rough grassland and moorland forming the major land use for around half of this area. Less than 5% of the rural area is woodland and forest¹⁹⁵.

The Water of Leith is described by the Scottish Environment Protection Agency (SEPA) as a small, calcareous river¹⁹⁶. Whilst it is a mid-altitude river, it is a high energy river, particularly where it passes through the City, dropping in height around 50m over a distance of 10km between Longstone and Bonnington¹⁹⁷.

The ability of the Water of Leith to provide water, power, disposal facilities and safe mooring at its mouth, means that it has been actively used for several hundred years. This has changed flow characteristics and water quality from what would be expected in a “natural” river. Above Harperrig Reservoir the river is still relatively natural in form, but from the Reservoir downstream the river is considered to be “heavily modified” by SEPA under the Water Framework Directive.

Flow

By 1791 there were 76 mills along the Water of Leith¹⁹⁸, which were used for a variety of industries including grinding corn, flour, spices, bark and snuff; paper making; washing and waulking (fulling) cloth; tanning hides; and cutting timber and stones. Weirs and mill lades were constructed to provide adequate water for the mills.

In the mid 1800s the flow was further altered through the tapping of the headwaters to provide a clean water supply for Edinburgh and the consequent construction of Harlaw, Threipmuir and Harperrig reservoirs, which ensured continuity of water supply in the river for mill owners. Harperrig, which is on the Water of Leith, was constructed in 1859¹⁹⁴.

Throughout the 20th Century the number of mills has declined, to the point where there are no working mills left on the river. Many of the features associated with the mills have also degenerated. Some weirs do remain, but in general these are not

¹⁹⁴ IEAP, 1993

¹⁹⁵ City of Edinburgh Council, 2001a

¹⁹⁶ SEPA, 2009a - d

¹⁹⁷ RRC, 2003

¹⁹⁸ The Statistical Account of Scotland referenced by Priestly, 2001

maintained, although there has been recent work at Bell's Mill Weir to repair a breach in the weir apron.

Approximately 29% of the Water of Leith catchment is under the control of Harperrig and Threipmuir/Harlaw reservoirs¹⁹⁹, with flows in the river are affected by discharges from the reservoir. Currently a minimum compensation flow of 34.38 megalitres per day²⁰⁰ (Ml/d) (as measured at Colinton) is maintained to replace the natural flow and there is a mean flow of 1233litres per second²⁰¹ (l/s). These flow rates are higher than what would have been expected in the river under unmodified conditions. Modelling carried out by East of Scotland Water suggested that the mean flow would be 1233l/s if the river were unmodified, and the flow that would be exceeded for 95% of the time (known as the Q95, which is often used to set compensation flows) would be 158l/s²⁰¹.

The Water of Leith discharges to the Firth of Forth via Leith Docks. Flow out into the Forth is controlled by lock gates. At times of high flow the lock gates are opened by Forth Ports, to enable discharge of excess flows.

The Water of Leith performs an important flood control function in the City. Following severe floods in 2000 a plan to improve the flood prevention capacity of the river has been developed, and will be implemented over the lifespan of this management plan. The flood prevention works have required alterations to the reservoirs, with consequent changes in flow in the river (see below).

Quality

The industrial use of the river led to the development of several villages and settlements along its banks. This led to reductions in water quality, which were recognised during the 19th Century. In 1864 the Water of Leith Commissioners introduced the first Water of Leith sewer, with a second one being constructed 15 years later¹⁹⁹.

SEPA and its predecessor body the Forth River Purification Board have monitored quality in the Water of Leith over many years and use the data to assess its condition. In addition there are monitoring sites on tributaries to the Water of Leith including the Murray Burn and Bavelaw Burn.

Water quality can be assessed either by direct measurement of chemical parameters such as biochemical oxygen demand (BOD) or by using biological indicators such as benthic invertebrates. Currently these indicate quite good water quality in most parts of the river though there are localised sources of pollution in some areas. Recent BOD measurements on the Water of Leith show that the BOD level is declining, indicating improvements in water quality²⁰².

Invertebrate quality is often assessed using the Biological Monitoring Working Group (BMWP) score, where different animals are assigned a score between 1 – 10 depending on their tolerance to pollution. An Average Score Per Taxon (ASPT) is usually also calculated to take account of differences in sampling effort. Results from the Water of Leith at Longstone show that the ASPT has remained fairly constant (between 5.2 and 6.04) since 2005²⁰³.

¹⁹⁹ IEAP, 1993

²⁰⁰ Water of Leith Flood Prevention Scheme, Environmental Scoping Report, November 2001, City of Edinburgh Council 2001a

²⁰¹ Halcrow Group Limited, 2002

²⁰² SEPA, *pers comm*

²⁰³ Monitoring data provided by Sally Donaldson, SEPA

SEPA has classified the current status of the Water of Leith based on a number of features relating to its biology (e.g. macrophytes, invertebrates), water quality, and degree of modification²⁰⁴ (See Table 13.1). Using recording schemes designed for the Water Framework Directive the river has been given an overall status of Poor (with low or medium confidence); ecological status is considered Poor and overall chemical status is Pass.

Table 13.1: Summary of current classification of the Water of Leith and Bavelaw Burn under the Water Framework Directive (source: SEPA 2009a – e)

	Source to Harperrig Reservoir	Harperrig Reservoir to Poet's Burn	Poet's Burn to Murray Burn	Murray Burn to Estuary	Bavelaw Burn
Overall	Poor (L)	Poor (M)	Poor (M)	Poor (M)	Poor (M)
Ecological	Poor	Poor	Poor	Poor	Poor
Chemical	Pass	Pass	Pass	Pass	Pass

Note: letters in brackets indicate the confidence in the assessment where L is low, and M is medium.

The Water of Leith has been designated, since 1980, as a salmonid river under the EC Fish Directive²⁰⁵. The purpose of the directive is to protect or improve the quality of running or standing fresh waters which support fish life or which, if pollution were reduced or eliminated, would become capable of supporting fish life. The directive is implemented in Scotland under the Surface Waters (Fishlife) (Classification) (Scotland) Direction 1999²⁰⁶. The directive prescribes imperative chemical and physical standards which must be met by designated fresh waters, and guideline values which member states must endeavour to observe. Compliance is measured at one location on the Water of Leith; Anderson Place. Between 2005 and 2007 the river met the imperative standards but failed the guideline standards for BOD (2005) and failed for nitrates and total ammonium (2005 to 2007)²⁰⁷.

Urban and industrial pollution is cited as the likely cause of these failures. SEPA has investigated reasons for localised water quality issues. The Longstone Combined Sewer Overflow (CSO) was identified as a problem area and was addressed in 2000. The Hailes Tip discharge into the Murray Burn, a tributary of the Water of Leith was also identified as a pollution source and flows were diverted to the foul sewer in 2003. Saughton Park Surface Water Overflow (SWO) was a further likely cause of reduced water quality²⁰⁸. Although pollution issues have been tackled at source, there remains a risk of intermittent pollution from any industrial estate connected to the surface water sewer. It is hoped that measures to address diffuse pollution issues can be agreed in the near future, potentially through retrofitting of sustainable urban drainage systems (SUDS).

Physical modifications

The historic industrial use of the river led to the installation of various weirs and mill leats. As these do not serve any active function, they are not generally maintained.

²⁰⁴ SEPA, 2009a - d

²⁰⁵ The European Communities Directive 78/659/EEC (the Directive), on the quality of fresh waters needing protection or improvement in order to support fish life was adopted in 1978.

²⁰⁶ http://www.sepa.org.uk/water/protected_areas/freshwater_fisheries.aspx

²⁰⁷ SEPA, 2007

²⁰⁸ SEPA, 2007

An exception is the weir near Magdala Crescent and the National Galleries of Scotland, which has recently received some maintenance work to repair a breach in the apron. The number, location and condition of individual weirs along the river has not been mapped, but will be investigated as part of the implementation of the River Basin Management Plans for the Scotland River Basin District. SEPA is currently delivering a project funded through the Restoration Fund, which will scope options to address the fish passage issues currently presented by the Dean Bridge weir and two other weirs immediately upstream of Dean Bridge.

Harperrig Reservoir is the largest modification to the river's flow. Whilst it was originally constructed to ensure continuity of river flow for the mill owners, it now has an important role in flood protection for Edinburgh by providing upstream storm water storage. A similar function is performed by Threipmuir and Harlaw Reservoirs on the Bavelaw Burn.

In spite of being a predominantly urban river, the Water of Leith is fairly natural for much of its course. Downstream of Harperrig Reservoir the main modifications are defunct weirs. The river is bridged in places, but is not culverted. For the most part the river is also fairly natural in terms of its course, and has received little modification in terms of alteration of its course, mainly because it is a hard rock river. The channel is more modified in its tidal sections, particularly in the docks and there is a small channelised section near Murrayfield ice-rink. In other areas, such as adjacent to Saunders Street in Stockbridge, the river is confined within walls, but exhibits signs of natural channel features such as vegetated side bars.

13.2 Current management initiatives

Water Framework Directive

The Water Framework Directive (WFD) has been translated into Scot's law through the Water Environment and Water Services (Scotland) Act 2003. The Act requires the creation of a river basin planning system which will promote sustainable water use whilst protecting and improving the water environment. SEPA is co-ordinating the delivery of river basin planning in Scotland although this is very much in partnership with a wide range of responsible authorities.

In order to deliver the required improvements to Scotland's water bodies, a River Basin Management Plan (RBMP) has been developed which will cover the period from 2009 – 2015. After this, RBMPs must be produced every six years. This includes provision for reducing the impacts of urban land management upon the beds and banks of rivers and bank side vegetation.

An Area Management Plan for the Forth Area Advisory Group area which includes the Water of Leith catchment will be produced in 2010. This will include a range of local measures to drive improvements. These measures will be delivered by a range of responsible authorities and through working in partnership with local groups and individuals e.g. landowners.

The WFD has required an assessment of water bodies based on how much they differ from near-natural conditions and the subsequent classification of water bodies at High, Good, Moderate, Poor and Bad ecological status. The new classification scheme required by WFD is wider than traditional water quality assessments and also includes assessments of the quantity of water available, the extent of physical alterations to the water body and the presence of invasive species. To meet the

requirements of the WFD, water bodies must be at good status or better by 2027 and deterioration in status should be prevented.

The main stem of the Water of Leith comprises 4 water bodies: source to Harperrig Reservoir; Harperrig Reservoir to Poet's Burn confluence; Poet's Burn to Murray Burn confluences; and Murray Burn confluence to Estuary. The main tributaries, the Bavelaw and Murray Burns are separate water bodies²⁰⁹. There are other minor tributaries of the Water of Leith, such as the Stank Burn that joins the Water of Leith near Murrayfield.

Above Harperrig Reservoir the river is considered to be natural, and the WFD sets the target of "good ecological status" for such rivers. By contrast downstream of the reservoir, the Water of Leith is designated as a Heavily Modified Water Body (HMWB) downstream of the reservoir, for which the target is "good ecological potential". The river is currently considered to be in poor ecological condition over all stretches.

Target dates for achieving good ecological status or good ecological potential are established by SEPA as part of the river basin management planning process. These vary along the Water of Leith and are summarised in Table 13.2.

SEPA has identified a number of pressures on the Water of Leith that need to be considered if the targets for good status are to be met. Downstream of the reservoirs these pressures include the impact on flows as a result of the reservoirs, modifications to the river channel, bed and banks, point source pollution, and barriers to fish migration. These are considered cumulatively along the length of the river. Actions to address these are also being identified and discussed with relevant stakeholders, but were not confirmed at the time that this plan was produced. However, it is likely that an assessment of barriers to fish passage will be required, which would consider the impacts of individual weirs and access of fish into the river through the Leith lock gates.

Above Harperrig the main pressure is morphological alterations (fish barriers further downstream, and forestry adjacent to river banks). Drinking water abstraction is considered to be a contributory pressure as it causes changes in natural flow conditions. Downstream of Harperrig the pressures on the Water of Leith are also morphological (changes to natural habitats along the river, presence of concrete banks, presence of weirs inhibiting fish migration), flow regulation (as a result of discharges from the reservoirs and abstraction of water at the springs); and diffuse and point source pollution (from phosphorus in localised areas).

Further details of the current status of physical and biological elements of the different stretches of the river, and actions required to improve their status, are available from SEPA website.

²⁰⁹ SEPA, 2009a - e

Table 13.2: Target dates and objectives for the Water of Leith. (Taken from SEPA 2009a – d).

	2008	2015	2021	2027
Source to Harperrig Reservoir	Poor	Moderate	Good	Good
Harperrig Reservoir to Poet's Burn confluence	Poor ecological potential	Poor ecological potential	Good ecological potential	Good ecological potential
Poet's Burn to Murray Burn confluences	Poor ecological potential	Poor ecological potential	Poor ecological potential	Good ecological potential
Murray Burn confluence to Estuary	Poor ecological potential	Poor ecological potential	Poor ecological potential	Good ecological potential
Bavelaw Burn	Poor ecological potential	Good ecological potential	Good ecological potential	Good ecological potential

The Bavelaw Burn is a major tributary of the Water of Leith. SEPA has identified it as a HMWB because of Harlaw and Threipmuir reservoirs. It is predicted to reach good ecological potential by 2015 (see Table 3). The main pressures on the river are considered to be flow regulation (as a result of the dams and collection of water upstream) and morphological change (due to impacts on fish passage)²¹⁰.

An Area Management Plan is being prepared, which will include separate topic papers for each catchment.

Flood defence works

The City of Edinburgh Council is implementing a flood defence scheme on the Water of Leith. The scheme is designed to accommodate a 1 in 200 year flood event with climate change by including a 12% increase in design flows to allow for global warming²¹¹. The main works will be implemented at the reservoirs and between Longstone and Bonnington, and includes:

- works to the reservoirs to drawdown levels by 600mm or 900mm depending on the reservoir;
- raising existing defences,
- providing new defences and altering existing properties to provide a structural flood defence;
- constructing a number of pumping stations and flap valves to prevent flood water from entering the surface water drainage system and causing secondary flooding²¹²; and
- bridge replacement/raising works at:
 - Bell Place Bridge, Stockbridge Colonies;
 - Footbridge across Water of Leith at Damside;
 - Footbridge crossing the Water of Leith near Belford Bridge²¹².

Three types of flood defences are proposed: reinforced concrete walls, piled walls, and embankments.

²¹⁰ SEPA, 2009e

²¹¹ Arup, 2003a

²¹² Arup, 2003b

A new combined sewer overflow (CSO) has also been constructed near Magdala Crescent as part of the works, to ensure that water quality is maintained at times of low flow.

The water levels in the reservoirs will be permanently reduced so that they have greater storage potential. However this means that there may be impacts upon the reservoirs' ability to maintain compensation flows during droughts. It has been calculated that the compensation flow will need to be reduced from the current levels (around 34.4MI/d) to 28MI/d to ensure that water can be maintained in the river even during drought conditions. Hydrological analysis of historical data suggests that these compensation flows could be met for droughts that are less severe than a 1 in 140 year event²¹³, but under climate change scenarios there might be years when a compensation flow of 28MI/d could not be met. Estimates of what compensation flow might be maintained under climate change have been calculated, as a flow of 23 MI/d. At this stage it is not proposed that this lower compensation flow will be introduced due to uncertainties in the accuracy of the climate change predictions²¹⁴. Even at these reduced levels it has been stated that "low flows in the river during a drought will, however, still be over twice the natural levels that would have occurred prior to the construction of the reservoirs."²¹⁵

The timetable for implementation is subject to funding. Work to Harperrig Reservoir to reduce levels was implemented in 2009. Similar works were carried out at Threipmuir and Harlaw in 2010. Work on floodwalls within the City is unlikely to start until early 2011 at the earliest, and will be conducted in phases. At the time of writing it is likely that the most downstream sections (Bonnington, Warriston and possibly Stockbridge Colonies) will form the first phase of works. Further updates are available from www.edinburgh.gov.uk/.

Management of flows from the reservoirs, and levels in the river, will form one element of flood control in the City. As noted above, Forth Ports also cooperates in regulation of flows in the river, through creating extra storage capacity for high flows in the docks, and discharges of surplus water through the lock gates.

Flood contingency plans for the Water of Leith are in place.

EU Floods Directive: This is implemented through the Flood Risk Management (Scotland) Act 2009, which states that Scottish Ministers, SEPA and responsible authorities (i.e. Councils) must "exercise their flood risk related functions with a view to reducing overall flood risk". It also says that they must

- "act in the way best calculated to manage flood risk in a sustainable way";
- "promote sustainable flood risk management";
- "act with a view to raising public awareness of flood risk; and"
- "act in the way best calculated to contribute to the achievement of sustainable development".

The main influences of the Council's functions on the management of the Water of Leith are:

- carrying out clearance and repair works where they would substantially reduce the risk of flooding;

²¹³ Babbie, 2004

²¹⁴ Alvin Barber, *Pers comm*

²¹⁵ Arup, 2003a

- managing Harlaw, Threipmuir and Harperrig reservoirs in order to reduce peak flows in the river during a flood; and
- constructing flood defences under the confirmed Water of Leith Flood Prevention Scheme

Litter Control

Litter and dumped materials are issues that are often raised by users of the Water of Leith. For example, in 1993 around one third of fishermen identified litter as an issue and litter was also raised as an issue during a visitor survey conducted in the same year²¹⁶.

Litter and debris removal is currently managed in a number of ways. Litter is swept downstream with the current and collects against the boom at Leith Docks. Water of Leith 2000, who own the solum of the river downstream of West Bowling Green Street to the Docks carry out a weekly assessment of litter and debris, and keep records of their findings. The survey, which is conducted from a boat, also involves the collection and removal of large items. Particularly significant collections of litter are reported to the Council, who then arrange collection. The Water of Leith Conservation Trust volunteer team organise around 50 river clean-ups annually, which involves around 30 local community groups, who undertake work on their local stretch of river. Effort is concentrated in the spring with around 25 clean-ups taking place between March and June. This amounts to around 4000 volunteer hours and on average around 300 cubic meters of waste is removed annually.

Energy generation

Much of the current character and historical value of the Water of Leith originates from its long use to generate power for a number of mills. As electricity became readily available from other sources, the value of the river to power machinery declined. In recent years there has been increased interest in small-scale renewable energy projects to help reduce reliance on fossil-fuels. A feasibility study of several sites on the Water of Leith has been conducted²¹⁷, and there is also interest in establishing sites near to Harperrig and Threipmuir Reservoirs. It will be important to ensure that any schemes do not compromise the delivery of targets for fish passage under the Water Framework Directive. (See also [Section 6.2](#)).

13.3 Objectives and actions

Aims & Objectives: *To maintain and create a river that is as clean and natural as possible and reaches good ecological potential within the confines of an urban setting, whilst protecting homes and businesses from flooding.*

Specific objectives for water are:

- Resist the construction of culverts on the Water of Leith, and promote the removal of culverts on tributary rivers (this is supported by Local Plan policy).
- Support measures included in River Basin Management Plans to avoid and restore urban pressures on river beds, banks and bank side vegetation. For example, ensure that development and uses do not encroach on areas that are required by the river for natural processes e.g. erosion and deposition (subject to the requirements of flood defence) and over-topping of banks (such as near Saughton Prison).

²¹⁶ IEAP, 1994

²¹⁷ Renewable Devices Energy Systems Ltd, 2006

- To manage the river to minimise flood risk, whilst mimicking natural flow variations.
- Identify the current location and position of each weir and prepare objectives for each in terms of whether they should be retained, allowed to degenerate, have fish passes introduced (N.B. the assessment of benefits to fish passage will need to be assessed within the context of barriers to fish passage presented by the lock gates at Leith).
- All proposals for maintenance dredging or modifications to the river or river modifications should be subject to an ecological appraisal process (excludes dredging in the docks, which is subject to a different consent process).
- Compensation flows for the reservoirs should be set with regard to ecological (including fish) requirements in the rivers and reservoirs.
- Compensation flows should be set that ensure that flows at Colinton are achieved by discharges along both the Bavelaw Burn and Water of Leith.
- Implementation of actions required under the WFD as set out in the River Basin Management plan information sheets.
- Maintain and improve the water quality of the Water of Leith.
- Sources and reasons for downgrading in the water and aesthetic quality of the river (E.g. Murray Burn) should be identified and strategies developed for their improvement.
- The current programme of litter clean-ups organised by the Water of Leith Conservation Trust should be continued.
- The current arrangements for litter control at the dock gates, which involves a voluntary agreement between the Council and private landowners should be formalised.
- Public awareness of litter issues should be raised.
- Measures to avoid or mitigate pollution as a result of the construction of the flood works should be implemented, either through regulation or via the contract documents for the works.
- That all new and novel uses of the river (e.g. micro hydro generation) are fully assessed for their impacts upon the natural and cultural resources of the river.

Rationale: Although the Water of Leith is an urban river, whose flow has been extensively modified for water supply and flood prevention, it retains many of the features and characteristics of a natural river. Much of the bed of the river remains unmodified, it has no culverts and natural processes of deposition and erosion can be observed. These processes are not only beneficial for wildlife and landscape quality, but also provide a valuable visual teaching resource in the City. The WFD is acting as the catalyst for further improvements in water and aesthetic quality.

Actions to maintain and create a river that is as clean and natural as possible and reaches good ecological potential within the confines of an urban setting. (Lead Agencies are shown in bold). Links to the consolidated list of prioritised actions in Section 3 are shown in brackets e.g. (A61).

Action	Lead Agency & partners ²¹⁸	Targets
W1: Oppose any further culverting and seek to remove existing culverting where possible including on tributary burns. (A61).	CEC Development Planning, SEPA - City	No increase in culverts.
W2: Support the implementation of objectives in the Scotland River Basin Management Plan prepared by SEPA, particularly with respect to reducing pressure on beds and banks of rivers and bank vegetation. E.g. ensure that development and use does not encroach on areas required by the river for natural processes e.g. near Saughton Prison (subject to the requirements of the flood defence scheme) (A62).	CEC Development, SEPA - City	a) Undertake survey to identify areas (some Geomorphological data already exists) b) Produce maps showing key areas c) use maps to inform planning process d) Monitor success via WFD process.
W3: Develop and implement a strategy for weir retention/removal, which addresses weirs as barriers to fish passage and as potentially important cultural resources. This will require an audit of weirs along the river to identify their condition, cultural significance and impact on fish passage; a review of existing data on fish habitats to identify benefits of removing individual weirs; and stakeholder meetings. (See A39) (N.B. the assessment of benefits to fish passage will need to be assessed within the context of barriers to fish passage presented by the lock gates at Leith).	SEPA, WoLCT, City of Edinburgh Council Archaeologist, Honorary Bailiffs,	a) Conduct survey. b) Agree strategy.
W4: Undertake ecological checks prior to all maintenance dredging in the river channel (excludes dredging within docks area, which is consented via a separate process (A63).	CEC Development Structures & Flooding, Private landowners - City	Maintain register of checks.
W5: Agree compensation flows post construction of flood defence scheme, which allow for ecological (including fish) requirements in the river and the reservoirs, and ensure that flows at Colinton are achieved by discharges along both the Bavelaw Burn and Water of Leith (A26).	SEPA, CEC Development Structures & Flooding, Honorary Bailiffs - City	a) Flows are adequate to retain trout populations in the river. b) No adverse impacts on fish populations in reservoirs. c) Flow safeguarded in both river channels.

²¹⁸ Organisations are: WoLCT – Water of Leith Conservation Trust; CEC CRS – City of Edinburgh Council Countryside Ranger Service; RIGS – Lothian and Borders RIGS Group of the Edinburgh Geological Society; SEPA – Scottish Environment Protection Agency; WoLAG – Water of Leith Action Group; EWHT – Edinburgh World Heritage Trust; PHRPRS – Pentland Hills Regional Park Ranger Service; HS – Historic Scotland; SNH – Scottish Natural Heritage.

Action	Lead Agency & partners ²¹⁸	Targets
W6: Manage river flows to minimise flood risk to homes and properties. (A18)	CEC City Development (will also require liaison with Forth Ports)	a) Flows meet other targets. b) Flood risk reduced from current levels.
W7: Implement actions required under the Water Framework Directive as set out in the River Baseline management Plan Water Body Information Sheets (A5).	SEPA	See targets set in River Baseline Management Plan Water Body Information Sheets.
W8: Safeguard water quality through reporting all suspected pollution incidents to SEPA (A65).	All organisations and individuals	Number of incidents recorded.
W9: Raise public awareness of procedure for reporting suspected pollution incidents (A66).	SEPA, WoLCT, Honorary Bailiffs	Production of awareness-raising materials.
W10: Implement SEPA's ongoing programme of chemical and biological monitoring and assessment against current standards (A17).	SEPA	Meeting WFD targets.
W11: Identify causes of water quality downgrading through actions identified by SEPA in Water Body information sheets. (A27)	SEPA, Scottish Water	Meeting WFD targets.
W12: Opportunities to upgrade CSOs should be identified and implemented as part of other development initiatives, where possible (A64).	SEPA, Scottish Water, CEC City Structures & Flooding	Meeting WFD targets.
W13: Litter (and debris) clean-ups to be included in annual work programme of Water of Leith to help address aesthetic issues (A8, A19).	WoLCT	Maintain programme of around 50 clean-ups per year.
W14: Litter and debris should be collected at the boom near the Victoria Swing Bridge and near Commercial Street, through appropriate mechanisms including voluntary agreements between the council and private landowners (A19, A28).	CEC Neighbourhood Teams, CEC Structures & Flooding, Forth Ports plc, Water of Leith 2000	a) Discuss litter collection at stakeholder meetings. b) Collection methods agreed and implemented.
W15: Include interpretation about litter in the Water of Leith Conservation Trust Visitor Centre displays. (A42)	WoLCT	Inclusion of information about litter.
W16: Avoid or mitigate pollution as a result of the construction of the flood works through implementation of actions in the Flood Prevention Environmental Action Plan. (A29)	CEC City Development - Structures and flooding & Natural Heritage, SEPA, WoLCT, Honorary Bailiffs, Flood defence contractors	Refer to Water of Leith Flood Prevention Scheme Environmental Action Plan.
W17: All new and novel uses of the river should be fully assessed for their impacts on natural, cultural and amenity use of the river. (A67)	CEC City Development, WoLCT, SEPA	All new proposals to be checked against planning objectives and the objectives in this plan.

Appendix A. Organisations consulted during preparation of the plan

Name & organisation	Comments/ data supplied
Water of Leith Conservation Trust: Helen Brown (Charlotte Neary in Helen's absence)	Various meetings & discussions. Information about Micro-hydro feasibility study; SEA screening study, Poet's Glen management plan 07, Water of Leith Millennium bid detailed appraisal review; disabled access report; interpretation plan; baseline document proposals; Antony Gormley statues proposals, wildlife data; Water of Leith Conservation Trust Business Plan; other information about the Trust. Part of Water of Leith Action Group & commented on early draft report.
SEPA: Sally Donaldson (ecologist) Shona McConnell – WFD officer Graeme Brown, Water of Leith Officer	Meeting Data relating to water quality; information about sampling; information relating to the Water Framework Directive. Also supplied comments on first draft water topic paper. Part of Water of Leith Action Group & commented on early draft report.
SNH: Carolyn Clark Susan Sweetman	Details of Balerno Common SSSI & protected species along route. Part of Water of Leith Action Group & commented on early draft report.
Forth Ports: Ray Clark, Properties Manager	Meeting to discuss Forth Ports interests. Part of Water of Leith Action Group & commented on early draft report.
Honorary Bailiffs: Fraser Sommerville	Work of the Honorary Bailiffs and their future aspirations and work programme. Also, provided details on invasive species. Provided comment on first draft fisheries topic paper. Part of Water of Leith Action Group & commented on early draft report.
SWT: Alastair Lyndon	No comments at this stage
CEC: Julie Dewar – Planning	Various meetings. Local Plan information; Bonnington Development brief; details of Local Biodiversity Sites; LBAP: contacts with Edinburgh World Heritage Trust; details of Appropriate assessment appraisals for the docks, current planning applications; details of Central Scotland Green Network; Harperrig management plan. Part of Water of Leith Action Group & commented on early draft report.
CEC: Andrew Smith, Planning - Landscape	Copies of relevant landscape character assessments; review of historic gardens and designed landscapes. Discussions about aspirations for landscape. Comments on first draft of landscape topic paper & subsequent discussion on action points. Part of Water of Leith Action Group & commented on early draft report.
CEC: Jenny Bruce – World Heritage Site liaison officer	Discussions re World Heritage Site and management planning process
CEC: Caroline Peacock & Malcolm Fraser – biodiversity officers	LBAP issues Commented on early draft report.

Name & organisation	Comments/ data supplied
CEC: Alvin Barber & John Wharrie – Structures & Flooding	Details of the flood defence scheme & current flood prevention measures. Part of Water of Leith Action Group & commented on early draft report.
CEC: Jenny Hargreaves & Caroline Robertson – Countryside Ranger Service	Work of the Countryside Ranger Service; Water of Leith maintenance plan; Parks & Gardens strategy; Colinton Dells management plan; RHS survey. Part of Water of Leith Action Group & commented on early draft report.
CEC: Douglas Cruickshank, Craig Dunlop, Steven Cuthill – Parks & Green space	Details of Council parks & management practices.
CEC: John Lawson – Curator of Archaeology	Archaeological issues and concerns for the management plan. Commented on draft cultural heritage chapter.
CEC: Paul McAuley - Assistant Conservation Officer, Museums Collections Centre,	Issues relating to St Bernard's Well
CEC: Stephen Webley – Forest Officer	Details of role & responsibilities including forest audit and developing forest strategy. Details of Edinburgh & Lothians Forest Habitat Network Partnership also supplied
Edinburgh World Heritage Trust: Director - Adam Wilkinson	Discussion of objectives for management plan.
Rosebery Estates: Jonathon Burrow - Dalmeny Estate	No comments at this stage
National Galleries of Scotland: Philip Long	Details of the new art installation for the river " <i>Six Times</i> "
Water of Leith 2000: Ron Kitchin - Managing Director	Details of land ownership and management issues
Historic Scotland: Ian Thomson	Discussion of Historic Scotland's interests. Comments on draft cultural heritage chapter in relation to Historic Scotland's role.
Pentland Hills Ranger Service: Alan McGregor & Susan Falconer	Role of the Pentland Hills Ranger Service in managing the headwaters of the Water of Leith and opportunities for collaborative working.