

FRONTIERS OF THE ROMAN EMPIRE WORLD HERITAGE SITE

THE ANTONINE WALL

Management Plan 2014-19

STRATEGIC ENVIRONMENTAL ASSESSMENT:
ENVIRONMENTAL REPORT



STRATEGIC ENVIRONMENTAL ASSESSMENT: ENVIRONMENTAL REPORT

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1. NON-TECHNICAL SUMMARY

1.1 Introduction

In July 2008 the Antonine Wall achieved international recognition by being inscribed as part of the Frontiers of the Roman Empire World Heritage Site. World Heritage Sites are places of outstanding universal significance.

The first Management Plan for the Antonine Wall covered the five-year period from nomination (2007-12). We are now consulting on draft five-year Management Plan for 2014-19 which draws on the work that has already been delivered and builds on the aspirations of the partners and other stakeholders. It summarises the actions delivered from the 2007-12 Management Plan, outlines a long-term strategy for the site, identifies key issues for the forthcoming Management Plan, and proposes aims and objectives to tackle these over the next five-year period.

Plans, programmes and strategies with the potential to have significant environmental effects are to be subject to environmental assessment prior to adoption. This is called 'strategic environmental assessment' – or 'SEA'. Historic Scotland considered that the Antonine Wall World Heritage Site Management Plan 2014-19 has the potential to result in significant environmental effects and so have undertaken an assessment. This report documents the assessment process and our findings.

1.2 What is Strategic Environmental Assessment (SEA)?

SEA is a systematic method for considering the likely environmental effects of certain plans, programmes and strategies. SEA aims to:

- integrate environmental factors into plan preparation and decision-making
- improve strategies and enhance environmental protection
- increase public participation in decision-making
- facilitate openness and transparency

SEA is required by the Environmental Assessment (Scotland) Act 2005. The key stages involve:

Stage	Activity
Screening	Determining whether the Plan is likely to have significant environmental effects and whether an SEA is required.
Scoping	Deciding on the scope and level of detail for the assessment and the consultation period. This is done in liaison with Scottish Natural Heritage (SNH) and the Scottish Environment Protection Agency (SEPA).
Assessment, mitigation & enhancement	Testing the contents of the Plan as it is developed, identifying mitigation measures and looking at ways to enhance positive effects.
Environmental Report	Publishing an Environmental Report on the findings of the assessment and consulting on that report and the Plan.
Adoption & monitoring	Providing information on the adopted Plan, how consultation comments have been taken into account and methods for monitoring the significant environmental effects arising from its implementation.

The assessment process is structured around SEA topic areas. These topic areas are the range of environmental issues which should be explored through the assessment. They include biodiversity, flora and fauna, population and human health, water, soil, air, climate, material assets, cultural heritage and landscape.

This Environmental Report:

- describes the context of the Management Plan
- describes the relevant aspects of the environmental baseline

- explains how the environmental assessment was carried out and which parts of the plan were assessed
- sets out the findings of the environmental assessment
- makes recommendations for improving the positive effects and mitigating the negative effects of the plan
- proposes indicators for monitoring significant or unknown effects

SEPA and SNH were consulted on the approach taken to the environmental assessment. The environmental report shows how their views have been taken into account.

1.3 Context

One of the early stages of the SEA process is to consider the relationship of the Plan to other relevant policies, plans, strategies (PPS) and environmental objectives. This allows key environmental protection objectives to be identified for consideration during its preparation. It is also important to identify both the plans and strategies that will influence the Plan and those that will be influenced by it. An understanding of the context and the hierarchy that the Management Plan sits within is also useful for giving early thought to mitigation measures and where they may be best implemented. Annex A sets out in more detail the PPS which have relevance to the Management Plan.

We also considered, in consultation with SNH & SEPA, the scope of our assessment. We decided to focus upon six topics – *biodiversity, flora and fauna, material assets, cultural heritage and landscape and geodiversity*. Section 4 sets out our reasoning for this.

In order to help consider the effects of the Plan we gathered information for each of the five Local Authorities that contain a section of the Wall. Section 3 and Annex B of the Environmental Report summarise the environmental baseline.

1.4 Assessment of the environmental effects of the draft Antonine Wall WHS Management Plan

A set of questions, called SEA objectives, were used to help predict the environmental effects of the Plan. These are shown in Table 4. This is a common way of assessing the environmental effects of plans, and helps to make the assessment systematic and consistent.

Overall the vision, aims and objectives of the draft Plan were found to have generally neutral or positive effects for the majority of the environmental topics with significant positive effects in particular arising for cultural heritage, due to this being the core driver of the Plan. There is the potential for some minor negative effects associated with increased access and potential compromise between natural and cultural heritage priorities. Potential to increase positive effects for natural heritage, including landscape and geodiversity, have been identified and will be delivered through use of a Sustainability Checklist during the delivery of objectives. The checklist will help to identify opportunities to increase positive effects, and also to implement mitigation where appropriate.

1.5 Mitigation measures/recommendations/monitoring

A key part of the environmental assessment is to identify mitigation measures and these can be achieved in a number of different ways. It can involve making changes to the Plan itself e.g. amending our priorities, adding environmental priorities to the Plan to strengthen the inclusion of environmental issues or proposing more detailed measures that should be considered as the Plan is implemented.

No significant negative effects were predicted during the course of the assessment which would require specific mitigation measures to be identified. In some cases, alternative wording was identified which would increase positive effects. In most cases this was identified during the development of the Plan, and the changed wording has already been implemented. In carrying out the assessment it became apparent that the negative, neutral or uncertain effects predicted were likely to be of a nature and scale that could be mitigated or enhanced in the implementation of objectives and actions. In light of this the assessment has recommended that many of the objectives, and actions related to them, should be subject to a Sustainability Checklist that can embed consideration of environmental objectives into detailed delivery of the Plan, and mitigate accordingly. The information

gathered from these checklists will also aid in the monitoring of the effects of the Plan.

In addition to what is set out within this report, we would also welcome your views on any other environmental matters which you think we should consider in finalising the Management Plan.

1.6 Consultation

This Environmental Report accompanies the Management Plan Consultation Document for a twelve-week period of public consultation which will run until **28 June 2013**, and any comments that you would like to make on either document are welcomed. We would be grateful if you could clearly indicate in your response which parts of the Consultation Document and/or Environmental Report you are responding to, as this will aid our analysis of the responses received. You may wish to respond to the questions provided within the Response Form but please do not restrict comments to these if there are any other matters you want to raise. Section 5 of the draft Plan provides more information on how to respond to this consultation.

2. INTRODUCTION

2.1 Background

The Antonine Wall is the most substantial and important Roman monument in Scotland. Built on the orders of the Emperor Antoninus Pius in the years following 140 AD, it extends for some 60 kilometres across central Scotland from Bo'ness on the River Forth to Old Kilpatrick on the River Clyde and marked the north western frontier of the Roman Empire.

The Wall functioned both as a frontier control and military defence. It comprised a substantial turf rampart built on a solid stone base fronted to the north by a broad, deep ditch and outer mound. To the south of the rampart was a road, the Military Way, which permitted the movement of troops, goods and materials and connected the series of permanent stone built forts which occur at roughly two mile intervals along its length. Between some of the forts there are smaller fortlets. Camps used by the troops building the Wall also occur at regular distances along the frontier.

The Antonine Wall represents one of many sections of a massive military system which stretched over 5000 km from northern Britain, through Europe to the Black Sea, and from there to the Red Sea and across North Africa to the Atlantic coast. This frontier helped

to protect – and define – the Roman Empire, one of the greatest states ever to have existed. The Antonine Wall was the most northerly frontier of the Empire, the last of a series of planned frontiers built in the second century AD and, at the time, the most complex ever constructed by the Romans.

2.2 Content and Purpose of the Management Plan

In July 2008 the Antonine Wall achieved international recognition by being inscribed as part of the Frontiers of the Roman Empire World Heritage Site (FREWHS). World Heritage Sites are places of outstanding universal significance. The Frontiers of the Roman Empire World Heritage Site (FREWHS) is a serial transnational World Heritage Site (WHS). It currently comprises Hadrian’s Wall (inscribed in 1987), the German Limes (inscribed in 2005) and the Antonine Wall (inscribed in 2008). These partners work internationally to protect and promote the FREWHS. In Scotland, a partnership of key local authorities and government agencies deliver strategic and operational functions specifically for the Antonine Wall.

The key purpose of a Management Plan is to provide for the overall management of the WHS in a manner specific to its character and needs to ensure maintenance of its Outstanding Universal Value. The Plan’s aims and objectives are thus based on an analysis of the site’s significance and the issues which currently face it, ensuring that solutions are identified to site specific problems. A Management Plan is, therefore, a means by which a site can demonstrate to the United National Educational, Scientific and Cultural Organisation (UNESCO) that it has adequate management mechanisms in place to ensure the Site’s conservation for future generations.

The first Management Plan for the Antonine Wall WHS covered the five-year period from nomination (2007-12). This draft five-year Management Plan for 2014-19 draws on the work that has already been delivered and builds on the aspirations of the partners and other stakeholders. It summarises the actions delivered from the 2007-12 Management Plan, outlines a long term vision for the site, identifies key issues for the forthcoming Management Plan, and proposes aims and objectives to tackle these over the next five-year period.

Table 1 sets out the key facts about the Plan including the area it covers and its purpose.

Responsible Authority	Historic Scotland (on behalf of the Antonine Wall Management Group)
Title of PPS	The Antonine Wall WHS: Management Plan 2014-19
PPS subject	Historic environment
Period covered by the plan	Five years
What prompted the plan?	The UK has obligations under the World Heritage Convention 1972 in relation to effective management of WHSs which require that every site has an appropriate management structure in place. It is UK policy that every World Heritage Site should have an up to date management plan.
Frequency of updates	Every 5 years
Area covered by the plan	The plan relates to the entire length of the Antonine Wall which spans five Local Authority areas.
Purpose of plan	A management plan is required by UNESCO to specify how the outstanding universal value of the World Heritage Site will be protected and managed for future generations. The Management Plan will provide a strategic framework for achieving the protection and management of the cultural and natural assets in the WHS and will identify specific aims & objectives for implementation of the framework within the WHS.
Contact point for queries	Patricia Weeks Antonine Wall World Heritage Site Co-ordinator Historic Scotland Longmore House Salisbury Place Edinburgh EH9 1SH

2.3 The Strategic Environmental Assessment process

The requirement for SEA comes from the **Environmental Assessment (Scotland) Act 2005**. The purpose of SEA is to ensure that information on the environmental effects of a plan or programme is gathered and made available to plan-makers and decision takers as it is prepared and implemented. In light of this an environmental assessment has been undertaken of the Antonine Wall WHS Management Plan 2013-18 (the Plan). This report documents and presents the findings of our assessment.

Under section 5(3) of the above Act, plans, programmes and strategies with the potential to have significant environmental effects are to be subject to environmental assessment prior to adoption. As part of the SEA process, the environmental assessment was 'scoped' and SNH and SEPA were consulted on the proposed scope and level of detail of the assessment. In general, both SEPA and SNH were content to agree with approach to the scope of the assessment. In the scoping report we specifically requested SEPA's views on the scope of the assessment in relation to the consideration of effects on air, soil and water as part of the assessment. We welcome the views offered by SEPA on this and in view of these we have scoped these topics out of the assessment. Further details on this are documented within section 4 of this Environmental Report.

Following on from the scoping stage, we undertook an environmental assessment of the vision, long-term aims and medium term objectives of the Plan. This report presents the results of that environmental assessment, sets out the measures proposed to mitigate the potentially adverse effects of the Plan and provides further detail regarding our intentions for the monitoring of those effects.

The Environmental Report accompanies the Consultation Document for a twelve-week period of public consultation which will run until 28 June 2013. The Response Form that accompanies the Consultation Document provides details of how to make comments on the Consultation Document and the Environmental Report and will help to structure your response.

Following the closing date, all responses will be analysed and considered along with any other available evidence. We will finalise the Management Plan and prepare an SEA Post-Adoption statement which, amongst other things, will summarise the representations received during the consultation process. We aim to finalise the Plan and SEA Statement within the next few months at which point it will become available through the Historic Scotland website: www.historic-scotland.gov.uk

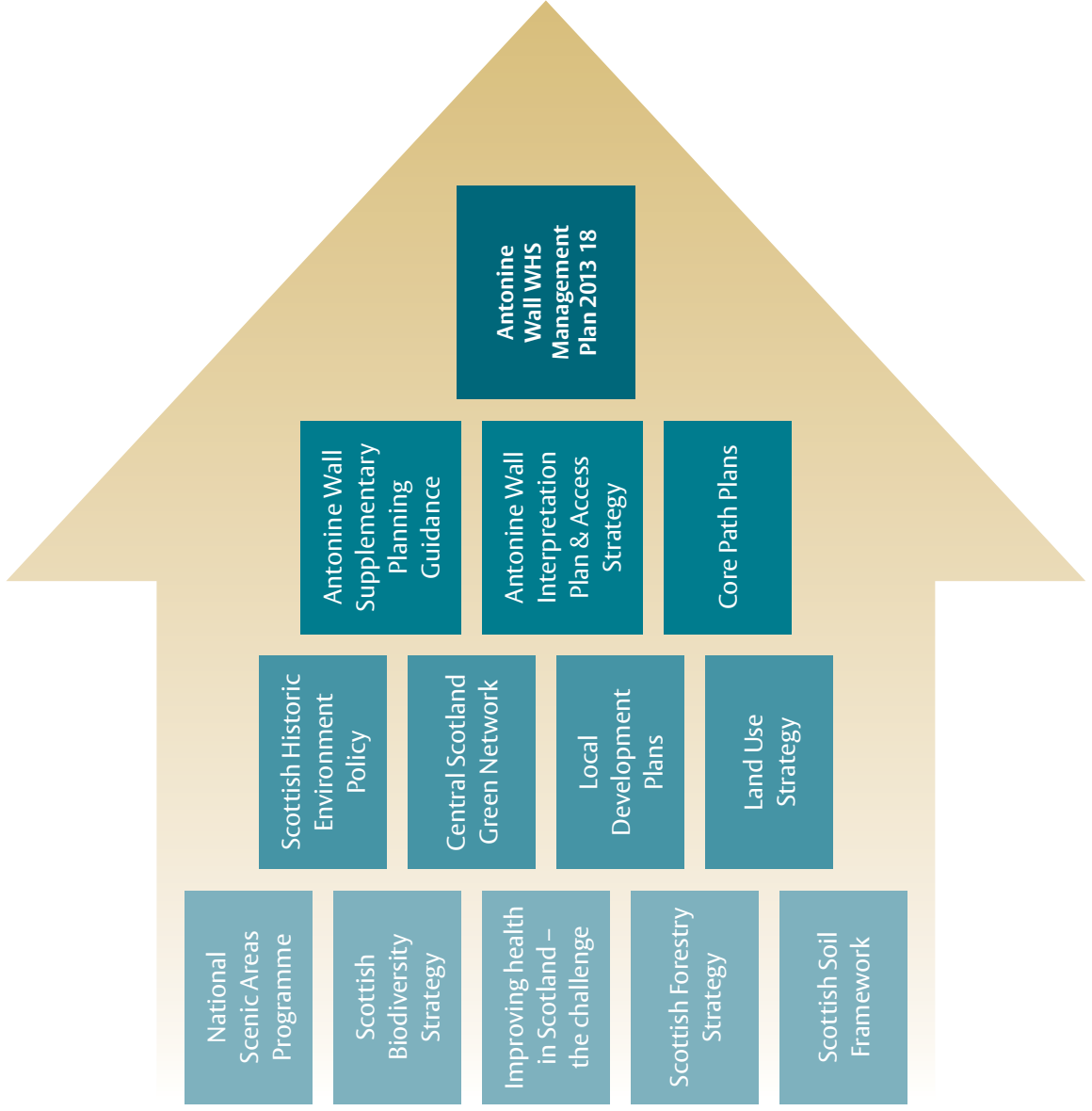
3. CONTEXT

3.1 Other plans, programmes, strategies and environmental objectives

One of the early stages of the SEA process is to consider the relationship of the Plan to other relevant policies, plans, strategies and environmental objectives. This allows key environmental protection objectives to be identified for consideration during the plan preparation process. It is also important to identify both the plans and strategies that will influence the Management Plan and those that will be influenced by it. An understanding of the context and the hierarchy that the Management Plan sits within is also useful for giving early thought to mitigation measures and where they may be best implemented.

The key environmental objectives identified from the review of legislation, policies, plans and strategies are illustrated here:

What are the key environmental drivers?



Issues to consider & objectives we can help deliver?

protect and enhance the water environment (with a requirement to ensure that the status of all waters are protected from deterioration)
manage access appropriately to avoid damage to archaeological sites or habitats, and disturbance to wildlife, especially breeding birds, by heavy public use of sensitive areas
enhance and, where appropriate, restore landscape character, local distinctiveness and scenic value
promote and encourage opportunities for people of all abilities to enjoy access to wildlife and the countryside
protect and where appropriate enhance the historic environment – specifically, protecting the archaeological remains, the line and the setting of the Antonine Wall (an ancient monument of international importance)
halt the loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats
protect and enhance species and habitats
minimise the impact of recreational access on other areas of natural and semi-natural vegetation
promote sustainable development
contribute towards the Central Scotland Green Network/ John Muir Trail
reduce the exposure of sensitive receptors to poor air quality
protect landscape character, local distinctiveness and scenic value
protect soil resources and promote soil function
reduce our contribution to climate change and be positioned to respond to the predicted effects of climate change
increase awareness, understanding and enjoyment of the natural and historic environment

3.2 Environmental Baseline

In order to establish the environmental effects of the Plan it is necessary to understand the environmental baseline of the area that is likely to be affected.

Schedule 3 of the Act lists the environmental topics that should be considered in SEA. As stated in the scoping report, due to the very wide geographic coverage of the Plan and the large number of environmental assets potentially affected, it is not possible to go down to a very detailed level. This description of the environmental baseline and a list of data sources can be found in Annex B.

The following summarises the gaps and/or unreliability of the SEA baseline data, and how they were minimised:

- The Antonine Wall WHS and buffer zone is a specific linear feature which occupies a small area of land within each local authority area. The environmental baseline information available across the SEA topic areas is typically produced at a local authority level, and therefore wider trends have had to be extrapolated as relevant to Antonine Wall WHS and buffer zone.
- There is a lack of information on landscape trends and the implications of climate change on the landscape and townscape, or historic environment. SNH is currently undertaking research to explore the landscape implications of climate change.
- There is limited information on local amenity, which can be extrapolated to some extent from the results of open space audits, which reflect the quality of open spaces. However although open space audits are underway or completed in the local authorities in question the results of the analysis are not widely available.

3.3 Environmental Issues

There are a number of environmental trends and issues involved with the management and promotion of the Antonine Wall WHS. The Antonine Wall is an extensive linear monument with varying degrees of above and below ground remains along its length, and passes through urban, suburban, semi rural and rural areas, requiring its management to be flexible and responsive to changing circumstances along its length. In terms of biodiversity, there is some continued habitat loss, fragmentation and deterioration. Woodland and trees form an important part of the landscape of the Antonine Wall WHS, and also have value in terms of biodiversity and the management of soil erosion and water flow. Developing land and woodland management regimes

which balance the sometimes conflicting priorities of the natural and historic environments is a key challenge for the Plan. For example, land and woodland management schemes which would have positive impacts on the historic environment and landscape of the Antonine Wall WHS could potentially have negative impacts on biodiversity, flora and fauna and geodiversity. The effect of climate change is an emerging issue of concern for the cultural heritage sector, and is also a key issue across several other environmental areas. In many areas, including the historic environment, understanding of potential impacts and mitigation options is at an early stage. There is potential for climate change mitigation actions to have cross-cutting environmental benefits, but there may also be tensions and conflict between mitigation actions which focus on impacts in one area, but which could have negative side-effects on other environmental topics.

4. ASSESSMENT APPROACH AND METHODS

4.1 Scope and Level of Detail of the Environmental Assessment

A key part of the scoping process in SEA is to identify whether the environmental parameters set out in schedule 3 of the Act are likely to be affected by the Plan. This can lead to some environmental parameters being 'scoped out' of the assessment. The scoping process helps to focus the SEA on the key significant issues.

An initial assessment was undertaken to identify the environmental parameters that are likely to be affected by the Plan and this is set out in Table 2. Following consultation with SEPA and SNH the scope of the assessment was confirmed. We particularly sought SEPA's views regarding effects on air, water and soil. SEPA agreed that significant effects on these topics were not likely, and consequently these topics have been scoped out of the assessment.

Table 2: Scoping In/Out

Environmental parameter	Scoped in/out	Potential issues arising from the Plan and justification for scoping in/out
Biodiversity, Flora and Fauna	In	There is potential for elements of the Plan, particularly those which set a framework for physical interventions, to have negative impacts upon biodiversity (e.g. through removal of trees or through site management actions). Conversely, there is also the potential for positive effects through establishment of a conservation framework and management regimes which integrate natural environment issues and priorities.
Population and Human Health	Out	The Plan will include some objectives and actions relating to increasing opportunities for outdoor recreation and access, providing both physical and mental health benefits, improved social inclusion and reduced levels of isolation linked. However, these elements of the Plan are set out in the Antonine Wall Interpretation and Access Strategy, which has recently (2011-12) been through the SEA process. As the Management Plan is not expected to have any significant additional effects in this area, Population and Human Health have been scoped out.
Soil	Out	The management of the Antonine Wall, particularly in relation to the approach to tree and woodland management, has the potential for effects on soil erosion rates. Landscape management restraints relating to farming practices may also have positive or negative effects on soil. We do not envisage that these effects are likely to be significant, and SEPA's scoping response agreed that any effects would be likely to be localised and not significant. Consequently, soil has been scoped out of the assessment.
Water	Out	We have not identified any interactions between the Plan and coastal water or groundwater quality. None of the objectives will involve water abstraction or activities that may alter the groundwater table or discharge contaminants to it. However, there is potential for the approach to tree and woodland management to have effects on soil erosion rates, which in turn may have impacts on groundwater flow and management. We do not envisage that these effects are likely to be significant, and SEPA's scoping response agreed that any effects would be likely to be localised and not significant. Consequently, soil has been scoped out of the assessment.
Air	Out	We have not identified any interactions between the Plan and air quality, other than those connected with objectives to increase and/or manage access to the Antonine Wall. The majority of these elements of the Plan are set out in the Antonine Wall Interpretation and Access Strategy, which has recently (2011-12) been through the SEA process. However, other objectives relating to public transport have the potential for both negative (increase in services to specific locations with localised effects on air) and positive (increased use of public rather than private transport with localised effects on air) effects. We do not envisage that these effects are likely to be significant, and SEPA's scoping response agreed with this view. Consequently, soil has been scoped out of the assessment.
Climatic Factors	Out	It is considered that the Plan will not have a significant effect on climate change in terms of emission of greenhouse gases. As with Air, the plan might affect the mode of transport chosen by visitors to come to visit the Antonine Wall, but it is unlikely that this will have a significant effect on climatic factors. In view of this, we intend to scope effects from the Plan on climatic factors out of the assessment. The effects of climatic change on the Antonine Wall and their relevance to the Plan will be considered under the relevant environmental topics.

Material Assets	In	We consider that the Plan has the potential for significant effects on tourism resources and forestry. Effects relating to public transport could be considered under the air parameter, if considered likely to be significant (see Air above). Where possible, we will seek to encourage the use of local and sustainable materials and in development of recreation infrastructure (e.g. as set out in Historic Scotland's Corporate Plan and accompanying SEA).
Cultural Heritage	In	We consider that the Plan should have positive effects for the promotion and conservation of the Antonine Wall and other heritage features. There is the possibility of conflicts between the priorities of cultural and natural heritage, with the potential to reduce positive effects.
Landscape and geodiversity	In	Establishment of land management strategies and guidance could potentially have negative and/or positive effects on landscape and scenic value, and geodiversity; the assessment process will allow identification and mitigation of any potential conflicts between cultural heritage priorities, including those relating to the landscape setting of the Antonine Wall WHS, and broader landscape priorities.

4.2 Scoping the parts of the Consultation Document to be included in the assessment

In the scoping report we noted that the assessment would be undertaken at a level of detail that enabled us to broadly predict the likely significant effects. Table 3 clarifies which elements of the consultative draft Management Plan we have assessed.

Table 3: Sections of Consultation Document to be assessed

Section/s	Assessed Y/N	Reasons
1. Introduction	No	These sections set the context of both Plan and assessment, and describe the consultation process.
2. Requirement for a management plan		
3. Consultative draft		
4. Consultation		
5. Responses to this consultation		
6. Handling your response		
7. Managing the World Heritage Site	No	This section sets out the roles and responsibilities of those involved in the management of the Antonine Wall WHS, and the range of stakeholders who have an interest in the site.
8. Delivery of the 2007-12 Management Plan	No	This section reviews achievements and developments over the life of the 2007-12 Management Plan, and draws out lessons learnt over this period.
9. Looking Forward	Yes	This section introduces the vision and long-term aims of the Plan, and sets out underlying issues and medium-term objectives; the content of this section will underpin all outcomes from the Management Plan.

4.3 Evolution of the environment in the absence of the Plan

If the Plan were not developed, it is considered that the likely future changes to the area could include:

- fewer people would enjoy, understand and value the cultural and natural heritage of the Antonine Wall WHS and its landscape;
- continuing risk of negative impacts on cultural and natural heritage through land management actions;
- more conflicts between cultural heritage and natural heritage through land management actions;
- less understanding of the impacts of climate change on the Antonine Wall WHS and its landscape, and consequently less likelihood of mitigating those impacts; and
- some negative effects possible from the lack of a proactive approach to site management/monitoring (lack of a coordinated effort).

4.4 How was the Consultation Document assessed?

We identified a series of questions designed to focus the assessment on those aspects of the Plan that will potentially lead to significant environmental effects. These questions were formulated through consideration of the environmental parameters that have been scoped into the assessment and the existing environmental baseline. In developing the questions we have sought to ensure that they are able to identify potential for maximising positive impacts as well as identifying negative impacts and opportunities for mitigation.

Table 4: Assessment Questions

Environmental Parameter	SEA Objective Will the aim/objective/action...	SEA Criteria How will the plan affect...
Biodiversity, Flora and Fauna	<ul style="list-style-type: none"> • Prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? • Promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? • Contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> ...SSSIs ...protected species ...ancient Woodland and veteran species ...wider biodiversity
Material Assets	<ul style="list-style-type: none"> • Maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? • Support national forestry policy? 	<ul style="list-style-type: none"> ...the quality and quantity of tourism resource provided by the WHS and wider area ...existing and future areas of forestry
Cultural Heritage	<ul style="list-style-type: none"> • Protect and where appropriate enhance the historic environment? • Promote positive effects for the historic environment through land management? • Promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? • Contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> ...the Antonine Wall WHS and its setting ...historic environment features and their setting
Landscape and Geodiversity	<ul style="list-style-type: none"> • Protect and enhance the landscape and geodiversity value of the WHS? • Promote positive effects for the landscape through land management? • Contribute to effective adaptation to potential impacts of climate change on the landscape? • Promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	<ul style="list-style-type: none"> ...the landscape value (including natural, aesthetic and cultural) of the WHS ...the landscape value of the wider landscape ...the geodiversity and geological value of the WHS

4.5 Alternatives considered during preparation of the Plan

SEA requires the consideration of reasonable alternatives – including the ‘do nothing’ scenario. At the highest level, we do not consider the ‘do nothing’ alternative (i.e. not to have a Management Plan) to be reasonable in this case. This is because the UK has obligations under the World Heritage Convention 1972 in relation to effective management of World Heritage Sites which require that every site

has an appropriate management structure in place. It is UK policy that every World Heritage Site should have an up to date Management Plan.







The SEA has assessed all reasonable alternatives which are identified in the course of developing the vision, aims and objectives which will be set out in the plan. At the highest level, we assessed the vision statement which underpins the subsequent aims and objectives. At the next level, we assessed alternative approaches (retention of current management aims or development

of amended aims) to establishing the overarching aims of the Plan. At the more detailed level of objectives alternatives were generated by consideration of the key issues related to each overarching aim, in conjunction with the relevant environmental baseline and issues, and predominantly took the form of alternative wording or phrasing of objectives. The majority of alternatives took the form of minor wording alterations which were identified and implemented during the iteration of the Management Plan.

5. ASSESSMENT FINDINGS

This assessment was carried out using a matrix approach of considering the vision, aims and objectives against a set of defined environmental questions. The matrix also includes a summary, and identifies mitigation options where relevant. The detailed findings of the assessment can be found in matrix tables provided in annex A. In addition to text commentary, scoring symbols have also been used:

Table 5: Scoring Key

	Significant positive effect
	Minor positive effect
	Neutral effect
	Minor negative effect
	Significant negative effect
	Uncertain effects

5.1 Summary of Findings

Vision

The assessment found that whilst the vision naturally focuses on a positive outcome for the Antonine Wall WHS from a cultural heritage perspective, it is also worded in such a way as to provide scope for the Plan to have broader environmental benefits.

Whilst developing the vision, it was recognised that inclusion of an emphasis on sustainability in the management of the site, and a recognition of the environmental benefits which the site can provide, would result in more positive environmental outcomes than the alternative of focusing solely on the historic environment aspect of the site. However, the level

of benefit will depend on the aims and objectives at lower levels of the plan. No negative effects were identified. Matrix 1 in Annex A provides the detailed assessment findings for the vision.

Long-term aims

The assessment of options for long-term aims found that, whilst neither option was likely to have negative impacts, the revised aims offered greater certainty and scope for potential positive effects across the environmental topics. This is the preferred option which has been taken forward to the consultative draft Management Plan. Matrix 2 in Annex A provides the detailed assessment findings for the long-term aims.

Medium-Term Objectives

Whilst the majority of significant positive effects were on cultural heritage objectives, the assessment found that there were some positive effects for other environmental factors, and that in many cases, there was the potential to increase these benefits through consideration of wider environmental factors in the delivery of objectives. Consequently, in many cases the assessment has recommended that a sustainability checklist should be applied to the delivery of objectives and actions which stem from them. More detail on the sustainability checklist is provided in the section on mitigation, below. No significant negative effects were identified, although the potential for minor, localised negative effects were identified. The assessment found that the likelihood of reduced positive effects, or minor negative effects, for the historic environment was increased by the proposal to integrate a commitment to balancing wider environmental concerns in the sustainable management of the WHS. At this level it is not possible to identify these effects in any detail, but use of the sustainability checklist will provide a mechanism for identifying and mitigating these effects as objectives are delivered. Matrix 3 in Annex A provides the detailed assessment findings for the medium-term objectives.

5.2 Cumulative, secondary and synergistic effects

The cumulative and synergistic effects of the Plan for the environment as a whole are likely to be positive. There will also be synergistic positive effects when the outcome of this Plan are combined with the outcomes of other relevant PPS, for instance Local Development Plans, the Antonine Wall SPG or Core Path Plans. We have also looked at the effects on the key ‘benefits and uses’ of the site which were identified by stakeholders during the plan making process which did not fit neatly into the SEA topics because of their crosscutting

nature. Matrix 4 in Annex A shows how the Plan is expected to affect these benefits and uses; in general, the overall trend is for cumulative positive effects.

6. MITIGATION AND MONITORING

The development and use of a sustainability checklist has been recommended in relation to several groups of objectives within the plan, in order to ensure that the potential for achieving positive effects, and mitigating negative effects, is embedded within the process for delivering the plan objectives. The sustainability checklist will be developed from the environmental objectives and criteria which have been used in this assessment, and will be published as part of the Post Adoption Statement.

Although no significant negative effects have been predicted through the assessment it will still be important to understand how the guidance is affecting the environment once it is being implemented. This will help to identify any effects arising which were not predicted through the assessment and allow appropriate mitigation to be sought. Monitoring of the environmental effects will be incorporated into overall monitoring strategy for the Plan (see objective 1.10). The Sustainability Checklist will play an important role in monitoring the identified effects. Our approach to monitoring will be considered further and outlined in our Post Adoption Statement.

7. APPROPRIATE ASSESSMENT

The plan qualifies as a land use plan to which Appropriate Assessment is applicable, in order to comply with Article 6 of the Habitats Directive.

The Antonine Wall and buffer zone adjoin the Firth of Forth SPA within the Falkirk Council area. As such, consideration has been given to the potential requirement for an Appropriate Assessment of the content of the plan.

However, given that the role of the Management Plan is to protect the status and setting of the Antonine Wall and its buffer zone (in particular, its OUV) and it is not a means for promoting development, there is no clear connectivity between this role and the qualifying interests of the Firth of Forth SPA. Therefore it is unlikely that the Plan or the actions flowing from it would undermine the conservation objectives of the site, nor have a significant effect on any qualifying interests either directly or indirectly. We are therefore of the view that an Appropriate Assessment is not required.

8. NEXT STEPS

The public consultation period on the consultative Draft Management Plan and the SEA Environmental Report will run for twelve weeks until 28 June 2013. Information on how to provide comments on this Environmental Report, and the draft Management Plan itself, can be found at section 5 of the main Plan document.

A final version of the Management Plan will be prepared following the consultation period to take into account comments made. All changes will be screened to consider if they raise significant environmental issues that have not already been considered in the environmental assessment. If the potential for significant environmental effects is identified, an assessment will be undertaken of their impact, and reported in the SEA Post Adoption Statement. This will be published along with the finalised Plan.

The SEA Post Adoption Statement, which will be published along with the final version of the plan, will demonstrate how the ER (and all the comments expressed on it) have been taken into account in the adopted Management Plan. The SEA Post Adoption Statement will also include a final version of the Sustainability Checklist to take into account comments made, and set out the monitoring strategy in further detail.






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ANNEX A – ASSESSMENT MATRICES

Matrix 1: Assessment of the Vision for the Antonine Wall WHS Management Plan 2014 19					
SEA topics	Biodiversity, flora and fauna	Material assets	Cultural heritage	Landscape and geodiversity	Summary and mitigation
will the overarching vision....	<ul style="list-style-type: none"> prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? support national forestry policy? 	<ul style="list-style-type: none"> protect and where appropriate enhance the historic environment? promote positive effects for the historic environment through land management? promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> protect and enhance the landscape and geodiversity value of the WHS? promote positive effects for the landscape through land management? contribute to effective adaptation to potential impacts of climate change on the landscape? promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
Vision wording	<p>The Antonine Wall will be: a World Heritage Site that is well maintained and sustainably managed to safeguard its Outstanding Universal Value; a property that is established as a world class visitor experience; a catalyst to connect and transform communities locally, nationally and internationally; a focus to realise sustainable benefits economically, socially and environmentally for locals and visitors alike; and a resource for inspiring learning and creating opportunity for participation and discovery.</p>	<p>The vision contains an explicit commitment to substantially enhancing the visitor experience of the site; this will be an enhancement of the tourism resource with potentially significant benefits.</p> <p>Whilst the vision does not specifically refer to commercial forestry, there is scope within it to ensure that forestry policy is supported. At this level, the vision is likely to have a neutral effect in respect of this criteria.</p>	<p>The vision is underpinned by a commitment to protect and enhance the site from a historic environment perspective. The introduction of commitments to consider the sustainable management of the site provide scope for the lower levels of the plan to address issues of climate change adaptation in a positive manner. However, the introduction of a commitment to realise sustainable benefits economically, socially and environmentally has the potential to require compromise where tensions arise between different sectors; this is unlikely to have negative impacts, although it could potentially temper the level of positive benefit for the historic environment in some circumstances.</p>	<p>The wording of the vision, particularly the inclusion of a commitment to sustainable management and to realising environmental benefits, provides scope within the management plan to have positive impacts for landscape and geodiversity. The emphasis on creating opportunity for participation and discovery is not limited to focusing on the cultural heritage aspects of the site, and therefore has the flexibility contributed to promotion and enhancement of the site from a landscape value and geodiversity perspective. However, the level of benefit will depend on aims and objectives at lower levels of the plan.</p>	<p>Whilst developing the vision, it was considered that introduction of an emphasis on sustainability in the management of the site, and a recognition of the environmental benefits which the site can provide, would provide scope for the plan to have broader environmental benefits, rather than focusing solely on the historic environment aspect of the site. In general, the vision is likely to have an overall positive environmental effect, although the level of benefit will depend to some extent on the content of aims and objectives at lower levels of the plan. No specific mitigation is recommended in respect of the vision.</p>

Matrix 2: Assessment of Options for establishing Long Term Aims for the Antonine Wall Management Plan 2014 19

SEA topics	Biodiversity, flora and fauna	Material assets
will the management plan objective...	<ul style="list-style-type: none"> • prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? • promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? • contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> • maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? • support national forestry policy?
Options for establishing long-term aims		
Option 1: carry forward existing long-term aims as set out in existing (2007-12) Management Plan	<p></p> <p>The existing aims do not incorporate any explicit consideration of biodiversity, flora and fauna. As the aims focus principally on the site (and its associated landscape) as a heritage asset, the potential impacts on biodiversity, flora and fauna are uncertain.</p>	<p></p> <p>The aims incorporate an aspiration to improve access to, and presentation of, the site. The focus is principally on the Wall and its immediate environs rather than the wider area. There could therefore be a minor positive effect for the tourism resource provided by the site itself.</p> <p></p> <p>Forestry and woodland issues are not explicitly referenced in the aims, and so the effects here are uncertain.</p>
Option 2: use a revised set of long-term aims for the 2014-19 Plan	<p></p> <p>One of the revised aims focuses on balancing wider environmental concerns in the sustainable management of the WHS. This aim encompasses biodiversity, flora and fauna, but does not refer to them specifically; to ensure that the potential positive effects of this aim are optimised, and negative impacts from conflicts of priority are avoided, lower level objectives and actions related to the plan should incorporate more specific reference to incorporation of these issues into the balanced management of the WHS.</p>	<p></p> <p>The aims include aspirations to protect and enhance the WHS, and improve physical and intellectual accessibility. This should have a positive effect on the WHS as a tourism resource. The focus remains on the WHS itself, and so impacts on wider tourism are likely to be neutral.</p> <p>As with the existing aims, forestry and woodland issues are not explicitly referenced in the revised aims; however, they have the potential for neutral or positive effects relating to national forestry strategy. This could be enhanced by ensuring that at a lower level measures are in place for the consideration of this issue.</p>





Matrix 2: Continued

Cultural heritage	Landscape and geodiversity	Summary and mitigation
<ul style="list-style-type: none"> • protect and where appropriate enhance the historic environment? • promote positive effects for the historic environment through land management? • promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? • contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> • protect and enhance the landscape and geodiversity value of the WHS? • promote positive effects for the landscape through land management? • contribute to effective adaptation to potential impacts of climate change on the landscape? • promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
 <p>The aims focus on positive management of the Antonine Wall and its landscape, and also on increasing knowledge and awareness of the Wall. The aims focus on the Wall and its immediate environs, and so whilst there would be localised positive effects, the effects on wider cultural heritage are likely to be neutral. The aims do not indicate any potential consideration or adaptation to climate change, and so the effects in that area are uncertain.</p>	 <p>The aims include some elements which address landscape, which could potentially have positive effects. However, there could also be potential for 'historic' landscape priorities to outweigh and conflict with other landscape values such as aesthetic and natural. The aims do not explicitly address enjoyment and understanding, or adaptation to climate change, with regard to landscape and geodiversity, so the effect on these SEA objectives is uncertain.</p>	<p>Overall, there are positive effects for site in an historic environment and tourism context, but the impact on wider environmental topics is uncertain as the aims do not indicate whether or how these may be taken into account in achieving the plan's aims.</p> <p>Recommendation: the aims should acknowledge that the site provides environmental benefits beyond tourism and the historic environment, and should provide more certainty about how these will be taken into consideration through implementation of the aims and at lower levels of the plan.</p>
 <p>As with the existing aims, the revised aims focus on the positive management of the WHS and its landscape, and also on increasing knowledge and understanding. However, the revised aims contain a more explicit commitment to the safeguarding and enhancing the Outstanding Universal Value of the WHS. The introduction of an aim to balance wider environmental concerns with the management of the WHS has the potential to reduce positive impacts, however, this is not likely to have a significant impact on the overall positive effects of this option. An emphasis on sustainable management provides scope for consideration of climate change adaptation measures at lower levels of the plan.</p> <p>The aims focus on the WHS itself, and so they are likely to have a neutral effect on the wider cultural heritage.</p>	 <p>The revised aims contain explicit reference to the management, conservation and protection of the natural landscape of the WHS. To ensure that positive effects are optimised, geodiversity could be explicitly referenced at the lower level of objectives/ actions.</p>	<p>There are predominantly positive effects across the environmental topics. The aims are worded to provide scope for the level of positivity to be increased at lower levels of the plan, where more detailed objectives will be set, that will lead to specific actions and outcomes.</p> <p>Recommendation: consideration should be given to how positive benefits for more biodiversity, flora and fauna, forestry and woodland issues, and landscape and geodiversity might be enhanced at the lower levels of the plan.</p>





**Matrix 3: Assessment of Medium Term Objectives for the Antonine Wall WHS Management Plan 2014 19:
AIM 1: SAFEGUARD AND ENHANCE THE OUTSTANDING UNIVERSAL VALUE OF THE WORLD HERITAGE SITE BY MANAGING, CONSERVING AND PROTECTING ITS CULTURAL AND NATURAL LANDSCAPE**

SEA topics	Biodiversity, flora and fauna	Material assets	Cultural heritage	Landscape and geodiversity	Summary and mitigation
will the management plan objective...	<ul style="list-style-type: none"> prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? support national forestry policy? 	<ul style="list-style-type: none"> protect and where appropriate enhance the historic environment? promote positive effects for the historic environment through land management? promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> protect and enhance the landscape and geodiversity value of the WHS? promote positive effects for the landscape through land management? contribute to effective adaptation to potential impacts of climate change on the landscape? promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
Medium-term issues/objectives					
Issue: The ANTONINE WALL WHS and its Buffer Zone					
Objective 1.1 The boundary of the ANTONINE WALL WHS and its buffer zone will be kept under review to ensure that its outstanding universal significance is adequately protected	 <p>Changes to the boundary and buffer would be determined in reference to the OUV, rather than biodiversity, flora and fauna issues. Any changes would be likely to be minor in scale, and would be unlikely to have any impact on the level of protection for biodiversity, flora and fauna</p>	 <p>Changes to the boundary and buffer would be determined in reference to the OUV, rather than tourism or forestry issues. Any changes would be likely to be minor in scale, and would be unlikely to have any significant impact on these factors.</p>	 <p>Changes to the boundary and buffer would primarily be determined in reference to the OUV, which focuses on historic environment and landscape. Although any changes would be likely to be minor in scale, this alternative would provide flexibility to ensure the altered understanding of the site can influence its protection and management.</p>	 <p>Changes to the boundary and buffer would primarily be determined in reference to the OUV, which focuses on historic environment and landscape. Although any changes would be likely to be minor in scale, this alternative would provide flexibility to ensure the altered understanding of the site can influence its protection and management.</p>	<p>The preferred option, which will keep the boundary and buffer under review, will overall have more positive effects than the alternative. No further mitigation is recommended.</p>
Alternative The boundary of the ANTONINE WALL WHS and its buffer zone will remain unaltered	 <p>This alternative would have no effect on biodiversity, flora and fauna objectives</p>	 <p>This alternative would have no effect on material objectives.</p>	 <p>This alternative would limit the ability of the plan to react to changes in understanding of the site, and could potentially reduce ability to achieve cultural heritage objectives.</p>	 <p>This alternative would limit the ability of the plan to react to changes in understanding of the site, and could potentially reduce ability to achieve landscape objectives.</p>	

Issue: Legislative and regulatory process of protection

<p>Objective 1.2 Ongoing inclusion of the ANTONINE WALL WHS in the preparation and implementation of all planning, regulatory and policy documents by central and local government, which may affect it</p> <p>Objective 1.3 Monitoring the effectiveness of the SPG in planning and protection decision making across all Partners' organisations</p> <p>Objective 1.4 Capacity Building to ensure that knowledge and understanding of the OUV of the World Heritage Site remains current amongst decision makers</p>	<p> This group of objectives focus on protecting the OUV of the site, and will be neutral in terms effects on biodiversity, flora and fauna. The objectives are not expected to affect the way in which other PPS might deliver positive effects for this SEA topic.</p>	<p> This group of objectives focus on protecting the OUV of the site, and will be neutral in terms effects on these material asset objectives. The objectives are not expected to affect the way in which other PPS might deliver positive effects for this SEA topic.</p>	<p> This group of objectives will have a positive effect on the protection of the cultural heritage of the site, and will promote appreciation and understanding. However, it is not anticipated that effects will be significantly more positive than the current baseline situation in this context.</p>	<p> This group of objectives will have a positive effect on the protection of the historic landscape value of the site, and will promote appreciation and understanding. However, it is not anticipated that effects will be significantly more positive than the current baseline situation in this context.</p>	<p>The overall effects of this group of objectives will be neutral to minor positive. No reasonable alternative objectives or mitigation options related to this issue were identified during the plan making process.</p>
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Issue: Risk Preparedness

<p>Objective 1.5 Development of a risk strategy, and associated mitigation measures</p> <p>Objective 1.6 Development of an agreed approach, nationally and internationally, to gathering and monitoring information on condition survey, and for implementing appropriate plans to counter any emergent problems</p>	<p> This group of objectives does not specify the scope of the risk strategy or approach to monitoring, and so the extent to which there might be effects on biodiversity, flora and fauna is uncertain.</p>	<p> This group of objectives does not specify the scope of the risk strategy or approach to monitoring, and so the extent to which there might be effects on these material asset objectives is uncertain.</p>	<p> It is known that the historic environment (including historic landscape) values of the site are key drivers for this group of objectives. The level of positive benefit will depend to some extent on the level of risk: the greater the risks, the more significant the benefit of risk preparedness.</p>	<p> It is known that the historic environment (including historic landscape) values of the site are key drivers for this group of objectives and so positive effects are expected for the historic aspect of landscape. The level of positive benefit will depend to some extent on the level of risk: the greater the risks, the more significant the benefit of risk preparedness. The extent to which there would be effects on other aspects of landscape and geo diversity are less clear.</p>	<p>This group of objectives will have risk preparedness for the historic environment at its core, so positive effects are predicted for cultural heritage objectives and some aspects of landscape. The level of significance of these effects is not yet clear, and may change over time.</p> <p>There is potential for positive effects on the other environmental topics, provided that they are taken into consideration as the risk strategy and monitoring approach are developed.</p> <p>Recommendation: the sustainability checklist should be applied to actions which ensue from these objectives.</p>
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Issue: A conservation framework for the ANTONINE WALL WHS

Objective 1.7

The development of an agreed conservation framework, to assist in the management of change in the landscape of the ANTONINE WALL WHS



This group of objectives originally focused on the OUV of the site. This limited the scope of the objectives to incorporate benefits for other environmental factors. The assessment process identified that potential for positive effects on biodiversity, flora and fauna could be increased by removing the specific focus on the OUV in developing the conservation framework. This will allow a more balanced approach which will benefit from the collaborative approach to conservation which is promoted by this group of objectives. The degree of positive benefit will depend on the extent to which the objectives relating to biodiversity, flora and fauna are embedded within the process of delivering these MP objectives.



This group of objectives originally focused on the OUV of the site. This limited the scope of the objectives to incorporate benefits for other environmental factors. The assessment process identified that potential for positive effects in the context of supporting forestry strategy could be increased by removing the specific focus on the OUV in developing the conservation framework. This will allow a more balanced approach which will benefit from the collaborative approach to conservation which is promoted by this group of objectives. The degree of positive benefit will depend on the extent to which the objectives relating to forestry strategy are embedded within the process of delivering these MP objectives. No specific benefits to the tourism resource are anticipated.



Widening the scope of the conservation framework to incorporate wider environmental issues may in some circumstances lead to compromise in terms of positive effects on cultural heritage. However, the historic environment will remain the key driver for this group of objectives, and the collaborative approach to conservation which is promoted by this group of objectives will have positive effects, some of which may be significant.







The wording of the objectives allows scope for benefits for aspects of landscape value beyond the historic, and also for geodiversity. The assessment process identified that potential for positive effects on landscape value and geodiversity could be increased by removing the specific focus on the OUV in developing the conservation framework. This will allow a more balanced approach which will benefit from the collaborative approach to conservation which is promoted by this group of objectives. The degree of positive benefit will depend on the extent to which the objectives relating to landscape and geodiversity are embedded within the process of delivering these MP objectives.

As this group of MP objectives developed, it was identified that a focus on conservation the OUV of the site would limit scope to achieve positive benefits for environmental areas beyond historic environment and landscape, and could potentially lead to negative effects. The wording was amended and there is now scope for consideration of natural heritage issues.

Overall, the effect of these objectives is likely to be neutral – positive; the level of positivity will depend on how well natural heritage issues are integrated as the objectives are taken forward.

Recommendation: the sustainability checklist should be applied to actions which ensue from these MP objectives, to ensure that wider environmental objectives are embedded at a lower level of the plan.

Issue: Monitoring and regulation frameworks

<p>Objective 1.10 The establishment of a joint monitoring and evaluation framework for the Management Plan, to include monitoring indicators that will allow meaningful comparison with international FREWHS Partners</p> <p>Objective 1.11 The creation of a set of management principles for the use of the international community on the identification, recording, research, protection, conservation, management, presentation and understanding of the Roman frontier.</p>	 <p>It is intended that the monitoring frameworks will incorporate monitoring on wider environmental factors, leading to a better understanding of trends and risks for the biodiversity, flora and fauna of the site, including in the context of climate change. In the short term effects are likely to be neutral, moving to minor positive in the medium – long term, as the findings of monitoring and evaluation are used to inform future PPS affecting the site.</p>	 <p>It is intended that the monitoring frameworks will incorporate monitoring on wider environmental factors, leading to a better understanding of trends and risks for the tourism resource of the site. In the short term effects are likely to be neutral, moving to minor positive in the medium – long term, as the findings of monitoring and evaluation are used to inform future PPS affecting the site.</p>	 <p>Introduction of a more co-ordinated approach to management principles across the Roman frontier will have positive effects not only for the site, but also for wider cultural heritage, nationally and internationally.</p>	 <p>It is intended that the monitoring frameworks will incorporate monitoring on wider environmental factors, leading to a better understanding of trends and risks for the landscape value and geo diversity of the site, including in the context of climate change. In the short term effects are likely to be neutral, moving to minor positive in the medium – long term, as the findings of monitoring and evaluation are used to inform future PPS affecting the site.</p>	<p>Overall, the effects of these MP objectives are likely to be neutral in the short term, developing to minor positive as opportunities to act on the monitoring and evaluation findings develop over time. Positive effects are stronger for cultural heritage as it will be at the core of the framework, and the introduction of international principles will bring additional advantages.</p> <p>Recommendation: the sustainability checklist should be applied to actions which ensue from these MP objectives, to ensure that wider environmental objectives are embedded at a lower level of the plan.</p>
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Issue: Implementing the Management Plan

<p>Objective 1.12 The Management Plan Steering Group, assisted by the delivery groups, will oversee the implementation, co-ordination and monitoring of the objectives in the Management Plan, in consultation and partnership with other stakeholders where appropriate</p> <p>Objective 1.13 The integration of actions into Partners' corporate planning frameworks</p> <p>Objective 1.14 The Management Plan Steering Group will be responsible for drawing up annual action plans derived from the medium-term objectives</p> <p>Objective 1.15 The Partners will keep under review financial and economic impacts, specifically approaches by Partners to capital and revenue spend, that will affect delivery of the Management Plan objectives</p>	<p>The Management Plan Steering Group, assisted by the delivery groups, will oversee the implementation, co-ordination and monitoring of the objectives in the Management Plan, in consultation and partnership with other stakeholders where appropriate</p> <p>The integration of actions into Partners' corporate planning frameworks</p> <p>The Management Plan Steering Group will be responsible for drawing up annual action plans derived from the medium-term objectives</p> <p>The Partners will keep under review financial and economic impacts, specifically approaches by Partners to capital and revenue spend, that will affect delivery of the Management Plan objectives</p>
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<p>Objective 1.16 To determine a strategy for building capacity across the ANTONINE WALL WHS</p>	<p>These objectives focus on procedure, with no strong links to effects on the environmental objectives.</p> <p>Issue: Capacity Building</p>
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<p>This objective focuses on procedure, with no strong links to effects on the environmental objectives.</p>	<p>This objective focuses on procedure, with no strong links to effects on the environmental objectives.</p>
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AIM 2: PROMOTE AWARENESS AND UNDERSTANDING OF THIS OUTSTANDING UNIVERSAL VALUE TO LOCAL, REGIONAL, NATIONAL AND GLOBAL AUDIENCES BY IMPROVING PHYSICAL AND INTELLECTUAL ACCESSIBILITY

SEA topics	Biodiversity, flora and fauna	Material assets	Cultural heritage	Landscape and geodiversity	Summary and mitigation
will the management plan objective...	<ul style="list-style-type: none"> prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? support national forestry policy? 	<ul style="list-style-type: none"> protect and where appropriate enhance the historic environment? promote positive effects for the historic environment through land management? promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> protect and enhance the landscape and geodiversity value of the WHS? promote positive effects for the landscape through land management? contribute to effective adaptation to potential impacts of climate change on the landscape? promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
Medium-term issues/objectives					
<p>Issue: Ensuring a strong visitor experience on site</p>					
<p>Objective 2.1 To implement key recommendations in the approved interpretation plan and access strategy: improving signage, interpretation, visitor information, access routes and visitor facilities at individual sites along the Wall.</p> <p>Objective 2.2 To promote and enhance use of the ANTONINE WALL WHS as a long-distance route and visitor facility that links communities a cross central Scotland.</p> <p>Objective 2.3 To consider transportation infrastructure more widely around the WHS and build business partnerships to facilitate access for visitors in and around the ANTONINE WALL WHS.</p> <p>Objective 2.4 To develop and foster links and partnerships with local tourism providers and other businesses, to provide an enhanced service for visitors.</p>	 <p>The SEA of the Interpretation and Access Strategy indicates that objective 2.1 has the potential for negative effects through actions which have direct impacts, but also for positive effects in terms of promotion of understanding and enjoyment of the site from a natural heritage perspective.</p> <p>At this level it is difficult to identify to any specific degree the nature of these negative effects, but in many cases, effects are likely to be minimal and localised. The remainder of this group of objectives is considered to have the potential for similar effects.</p>	 <p>This group of objectives is directly related to the enhancement of the tourism resource of the site, and is consequently likely to have a significant positive effect in this area.</p>  <p>There are no strong links to forestry strategy, so the effects here are likely to be neutral.</p>	 <p>The SEA of the Interpretation and Access Strategy indicates overall positive effects for the historic environment from objective 2.1. The remainder of this group of objectives is considered to have the potential for similar effects.</p>	 <p>The SEA of the Interpretation and Access Strategy indicates that objective 2.1 has the potential for negative effects through actions which have direct impacts, but also for positive effects in terms of promotion of understanding and enjoyment of the site from a landscape value and geodiversity perspective.</p> <p>At this level it is difficult to identify to any specific degree the nature of these negative effects, but in many cases, effects are likely to be minimal and localised. The remainder of this group of objectives is considered to have the potential for similar effects.</p>	<p>This group of objectives has the potential for mixed effects; use of the sustainability checklist is already embedded for those actions stem from the interpretation plan and access strategy, and should identify and help to mitigate negative effects at lower levels of the plan.</p> <p>Recommendation: the sustainability checklist should be applied to actions which ensue from these MP objectives, to ensure that wider environmental objectives are embedded at a lower level of the plan.</p>

Issue: Digital technologies and digital resources

<p>Objective 2.5 To develop and improve the web presence for the Antonine Wall</p> <p>Objective 2.6 To explore new opportunities for digital interpretation both on and off site</p> <p>Objective 2.7 To make use of the Scottish Ten scanning of the Antonine Wall</p>	<p> There are no strong links between this group of MP objectives and the biodiversity, flora and fauna objectives. Although there may be the opportunity for positive impacts through being able to use digital interpretation to reduce or replace access to fragile areas of the site, these will likely be minor and localised; overall the effect is expected to be neutral.</p>	<p> This group of objectives will contribute to an improvement of the visitor experience on the site. However, there will be a neutral effect on the physical tourism resource of the site. There are no strong links between this group of MP objectives and the forestry strategy objective, so the effect will be neutral.</p>	<p> This group of objectives relates directly to the promotion and enhancement of the site from a cultural heritage perspective. There may also be minor, localised positive impacts through being able to use digital interpretation to reduce or replace access to fragile areas of the site.</p>	<p> There are no strong links between this group of MP objectives and the landscape value and geodiversity objectives. Although there may be the opportunity for positive impacts through being able to use digital interpretation to reduce or replace access to fragile areas of the site, these will likely be minor and localised; overall the effect is expected to be neutral.</p>	<p>As this group of objectives is likely to focus on the historic environment value of the site, neutral effects are likely for the majority of environmental objectives.</p>
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Issue: Museum Collections and Intangible Heritage

<p>Objective 2.8 To explore greater partnership working, both within Scotland and internationally across the FREWHS, between museum, and heritage centre, partners</p> <p>Objective 2.9 To encourage wider community engagement and participation with collections and intangible heritage related to the ANTONINE WALL WHS</p>	<p> There are no strong links between this group of MP objectives and the biodiversity, flora and fauna objectives.</p>	<p> There are no strong links between this group of MP objectives and the tourism resource and forestry strategy objectives.</p>	<p> This group of objectives relates directly to the promotion and enhancement of the site from a cultural heritage perspective.</p>	<p> There are no strong links between this group of MP objectives and the landscape value and geodiversity objectives.</p>	<p>As this group of objectives is likely to focus on the historic environment value of the site, neutral effects are likely for the majority of environmental objectives.</p>
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Issue: Marketing, Tourism and Communications

Objective 2.10

A visitor profile will be developed for each section of the Antonine Wall where public access is facilitated

Objective 2.11

A Tourism and Marketing Strategy will be developed that takes into account the need for a sustainable approach to site development

Objective 2.12

A Media and Communications Plan will be developed



This group of MP objectives has the potential to contribute to an increased understanding and enjoyment of the natural heritage values of the site. However, the degree to which this might occur is not clear at this level, and the effects are likely to be neutral without further measures to ensure this objective is embedded in delivery of these MP objectives.



This group of MP objectives will contribute to an improvement of the visitor experience on the site. However, there will be a neutral effect on the physical tourism resource of the site. There are no strong links between this group of MP objectives and the forestry strategy objective, so the effect will be neutral.



This group of MP objectives relates directly to the promotion and enhancement of enjoyment and understanding of the site from a cultural heritage perspective.






This group of MP objectives has the potential to contribute to an increased understanding and enjoyment of the landscape and geodiversity values of the site. However, the degree to which this might occur is not clear at this level, and the effects are likely to be neutral without further measures to ensure this objective is embedded in delivery of these MP objectives.

As this group of objectives is likely to focus on the historic environment value of the site, neutral effects are likely for the majority of environmental objectives.
Recommendation: the sustainability checklist should be applied to actions which contribute to these MP objectives, to ensure that wider environmental objectives are embedded in the delivery of the plan.

AIM 3: REALISE THE WORLD HERITAGE SITE'S FULL POTENTIAL AS AN EDUCATION AND LEARNING RESOURCE

SEA topics	Biodiversity, flora and fauna	Material assets	Cultural heritage	Landscape and geodiversity	Summary and mitigation
will the management plan objective...	<ul style="list-style-type: none"> prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? support national forestry policy? 	<ul style="list-style-type: none"> protect and where appropriate enhance the historic environment? promote positive effects for the historic environment through land management? promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> protect and enhance the landscape and geodiversity value of the WHS? promote positive effects for the landscape through land management? contribute to effective adaptation to potential impacts of climate change on the landscape? promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
Medium-term issues/objectives					

Issue: Strengthening the use of the ANTONINE WALL WHS in formal education

<p>Objective 3.1 To develop and implement an education strategy for the ANTONINE WALL WHS</p> <p>Objective 3.2 To promote UNESCO WHS values</p> <p>Objective 3.3 To strengthen international education links between FRE Partners</p> <p>Objective 3.4 To encourage CPD opportunities for education staff, to build capacity in teaching about the ANTONINE WALL WHS</p>	<p> This group of MP objectives has the potential to contribute to an increased understanding and enjoyment of the natural heritage values of the site. However, the degree to which this might occur is not clear at this level, and the effects are likely to be neutral without further measures to ensure this objective is embedded in delivery of these MP objectives.</p>	<p> This group of MP objectives relates directly to the promotion and enhancement of enjoyment and understanding of the site from a cultural heritage perspective.</p>	<p> This group of MP objectives has the potential to contribute to an increased understanding and enjoyment of the landscape and geodiversity values of the site. However, the degree to which this might occur is not clear at this level, and the effects are likely to be neutral without further measures to ensure this objective is embedded in delivery of these MP objectives.</p>	<p>As this group of objectives is likely to focus on the historic environment values of the site, neutral effects are likely for the majority of environmental objectives. However, there is potential to introduce positive effects for other aspects of the environment.</p> <p>Recommendation: the sustainability checklist should be applied to actions which contribute to these MP objectives, to ensure that wider environmental objectives are embedded in the delivery of the plan.</p>
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Issue: Strengthening use of the Wall in informal education and outreach

Objective 3.5

To support local communities to use the ANTONINE WALL WHS in informal education and outreach initiatives

Objective 3.6

To build a programme of events and activities for families, special interest groups and the general public



This group of MP objectives has the potential to contribute to an increased understanding and enjoyment of the natural heritage values of the site. However, the degree to which this might occur is not clear at this level, and the effects are likely to be neutral without further measures to ensure this objective is embedded in delivery of these MP objectives.



There are no strong links between this group of MP objectives and the tourism resource and forestry strategy objective, so the effect will be neutral.






This group of MP objectives relates directly to the promotion and enhancement of enjoyment and understanding of the site from a cultural heritage perspective.



This group of MP objectives has the potential to contribute to an increased understanding and enjoyment of the landscape and geodiversity values of the site. However, the degree to which this might occur is not clear at this level, and the effects are likely to be neutral without further measures to ensure this objective is embedded in delivery of these MP objectives.





As this group of objectives is likely to focus on the historic environment values of the site, neutral effects are likely for the majority of environmental objectives. However, there is potential to introduce positive effects for other aspects of the environment.
Recommendation: the sustainability checklist should be applied to actions which contribute to these MP objectives, to ensure that wider environmental objectives are embedded in the delivery of the plan.

AIM 4: BUILD STRONG STRUCTURAL AND ORGANISATIONAL PARTNERSHIPS WITH LOCAL, NATIONAL AND INTERNATIONAL ORGANISATIONS AND STRENGTHEN ENGAGEMENT WITH LOCAL COMMUNITIES, AND CONTRIBUTE TO SUSTAINABLE ECONOMIC GROWTH

SEA topics	Biodiversity, flora and fauna	Material assets	Cultural heritage	Landscape and geodiversity	Summary and mitigation
will the management plan objective...	<ul style="list-style-type: none"> prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? support national forestry policy? 	<ul style="list-style-type: none"> protect and where appropriate enhance the historic environment? promote positive effects for the historic environment through land management? promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> protect and enhance the landscape and geodiversity value of the WHS? promote positive effects for the landscape through land management? contribute to effective adaptation to potential impacts of climate change on the landscape? promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
Medium-term issues/ objectives					
Issue: International partnerships					
Objective 4.1	To maintain and enhance appropriate international links, sharing best practice in governance and management of the FREMHS				
Objective 4.2	To contribute to the development of management principles for the international community on the identification, recording, research, protection, conservation, management, presentation and understanding of the Roman frontier				
	These objectives focus on methods of working, with no strong links to effects on the environmental objectives.				
Issue: Local, Regional And National Partnerships					
Objective 4.3	To maintain and build strong working relationships between the Scottish Partners				
Objective 4.4	To build and develop a close working relationship between the Antonine Wall and Hadrian's Wall				
	These objectives focus on methods of working, with no strong links to effects on the environmental objectives.				
Issue: Engagement with local communities					
Objective 4.5	To maintain and develop strong partnerships between Partners and local and regional stakeholders and improve local mechanisms for consultation and engagement				
Objective 4.6	Strengthen links with local interest groups to create positive partnerships				
	These objectives focus on methods of working, with no strong links to effects on the environmental objectives.				

AIM 5: BALANCE WIDER ENVIRONMENTAL CONCERNS IN THE SUSTAINABLE MANAGEMENT OF THE WORLD HERITAGE SITE

SEA topics	Biodiversity, flora and fauna	Material assets	Cultural heritage	Landscape and geodiversity	Summary and mitigation
<p>will the management plan objective...</p>	<ul style="list-style-type: none"> prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? support national forestry policy? 	<ul style="list-style-type: none"> protect and where appropriate enhance the historic environment? promote positive effects for the historic environment through land management? promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> protect and enhance the landscape and geodiversity value of the WHS? promote positive effects for the landscape through land management? contribute to effective adaptation to potential impacts of climate change on the landscape? promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
<p>Medium-term issues/ objectives</p>					
<p>Issue: Balancing cultural and natural heritage</p>					
<p>Objective 5.1 Develop a sustainable and holistic approach to the inclusion of natural heritage issues within policies, plans and checklists for the Antonine Wall</p>	 <p>This group of MP objectives directly relates to the biodiversity, flora and fauna objectives, and aims to embed consideration of them within both this plan and others relating to the site.</p>	<p>?</p> <p>This group of MP objectives directly relates to the forestry strategy objective. At this stage, it is not clear how far objectives 5.3 and 5.4 might go towards supporting the national forestry strategy, although significant negative effects are not likely. There may however be conflicts between the priorities of the various environmental topics in this context.</p>  <p>There are not expected to be any notable effects on the tourism resource of the site.</p>	 <p>In committing to balance the cultural and natural heritage, there is the potential that some management actions may reduce the level of positive effect on cultural heritage, as there will be an increased likelihood of compromise where tensions between cultural and natural heritage priorities occur. However, there is also likelihood of neutral and positive effects, as many actions will be mutually beneficial, or will not impact on the historic environment values of the site.</p>	 <p>This group of MP objectives directly relates to the landscape value and geodiversity objectives, and aims to embed consideration of them within both this plan and others relating to the site.</p>	<p>Whilst there is potential for a reduction in positive effects for the historic environment through these MP objectives, the overall effects are likely to be positive.</p> <p>Recommendation: ensure that delivery of objectives 5.3 and 5.4 is informed by an understanding of national forestry strategy.</p>
<p>Objective 5.2 Identify, prioritise and review areas of specific natural heritage concern across the Antonine Wall, and implement sustainable approaches to site management to mitigate against future damage</p>					
<p>Objective 5.3 Develop guidance for the maintenance and enhancement of woodland on, and adjacent to, the line of the Antonine Wall WHS</p>					
<p>Objective 5.4 Integrate the Antonine Wall into Partners' and Stakeholders' emerging woodland management plans</p>					

Issue: Impact of climate change	
<p>Objective 5.5 Identify areas of the site at risk from climate change and integrate monitoring, mitigation and adaptation measures</p> <p>Objective 5.6 Implement and monitor measures to improve sustainability and energy efficiency in relation to site management</p>	<p> These MP objectives will allow the plan to contribute to effective adaptation to potential impacts of climate change on natural heritage.</p>
<p> There are no strong links between these MP objectives and the material assets objectives.</p>	<p> These MP objectives will allow the plan to contribute to effective adaptation to potential impacts of climate change on cultural heritage.</p>
<p> These MP objectives will allow the plan to contribute to effective adaptation to potential impacts of climate change on landscape value and geo diversity</p>	<p>Overall, the effects of these objectives will be positive. Recommendation: the sustainability checklist should be applied to actions which contribute to these MP objectives, to ensure that a holistic environmental approach is taken to their delivery.</p>

AIM 6: INCREASE RESEARCH OPPORTUNITIES NATIONALLY AND INTERNATIONALLY AND USE THIS NEW RESEARCH TO UNDERPIN WORK TO PROTECT AND PROMOTE THE WORLD HERITAGE SITE

SEA topics	Biodiversity, flora and fauna	Material assets	Cultural heritage	Landscape and geodiversity	Summary and mitigation
will the management plan objective...	<ul style="list-style-type: none"> prevent damage and encourage favourable condition to designated sites and protected species and undesignated biodiversity, flora and fauna? promote and enhance where appropriate enjoyment and understanding of the site from a natural heritage perspective? contribute to effective adaptation to potential impacts of climate change on natural heritage? 	<ul style="list-style-type: none"> maintain or enhance (where appropriate) the tourism resource of the WHS and the wider area? support national forestry policy? 	<ul style="list-style-type: none"> protect and where appropriate enhance the historic environment? promote positive effects for the historic environment through land management? promote and enhance where appropriate enjoyment and understanding of the site from a cultural heritage perspective? contribute to effective adaptation to potential impacts of climate change on cultural heritage? 	<ul style="list-style-type: none"> protect and enhance the landscape and geodiversity value of the WHS? promote positive effects for the landscape through land management? contribute to effective adaptation to potential impacts of climate change on the landscape? promote and enhance where appropriate enjoyment and understanding of the landscape value and geodiversity of the site? 	
Medium-term issues/ objectives					
<p>Issue: Developing a Research Strategy</p> <p>Objective 6.1 A strategy for research on the Antonine Wall will be prepared. This will be taken forward in conjunction with all bodies undertaking research on the Antonine Wall in universities, museums, archaeological societies and commercial archaeological units.</p> <p>Objective 6.2 A programme for ongoing survey, fieldwork and analytical research will be developed, derived from the priorities identified in the Research Strategy</p> <p>Objective 6.3 Opportunities for international collaboration will be sought, to link wider Roman frontier studies and the ANTONINE WALL WHS</p>					
	<p> These MP objectives will focus on the historic environment values of the site, and consequently there are no strong links with the biodiversity, flora and fauna objectives. However, there may be opportunity for research to increase understanding of the effects of climate change on these aspects of the site.</p>	<p> These MP objectives will focus on the historic environment values of the site, and consequently there are no strong links with the material assets objectives.</p>	<p> These objectives will contribute to understanding and enjoyment of the site. There is also potential for an increased understanding of the effects of climate change on the cultural heritage on the site, which would increase the positive effects.</p>	<p> These MP objectives will focus on the historic environment values of the site, and consequently there are no strong links with the landscape and geodiversity objectives. However, there may be opportunity for research to increase understanding of the effects of climate change on these aspects of the site.</p>	<p>With the exception of cultural heritage, which forms the focus of these objectives, the overall effect on wider environmental factors is expected to be neutral. However, there is an opportunity to increase positive effects through consideration of incorporation of research relating to climate change impacts.</p> <p>Recommendation: the research strategy objectives should consider the potential for increased understanding of climate change impacts on the site, in the context of both cultural and natural heritage.</p>

Issue: Disseminating information from Research

<p>Objective 6.5 Information provided publicly about the Antonine Wall will be accurate and to the highest standards</p> <p>Objective 6.6 Decisions about excavation and recording of sites on the Wall, and conservation and publications of finds should be informed both by appropriate legislative frameworks, and by the Antonine Wall Research Strategy</p> <p>Objective 6.7 Research discoveries, old and new, will be disseminated as widely as possible, and the results communicated in accessible, inclusive, informative and imaginative ways</p>	<p>○ These MP objectives will focus on the historic environment values of the site, and consequently there are no strong links with the biodiversity, flora and fauna objectives.</p>	<p>○ These MP objectives will focus on the historic environment values of the site, and consequently there are no strong links with the material assets objectives.</p>	<p>↑ These objectives will contribute to understanding and enjoyment of the site from a cultural heritage perspective.</p>	<p>○ These MP objectives will focus on the historic environment values of the site, and consequently there are no strong links with the landscape and geodiversity objectives.</p>	<p>With the exception of cultural heritage, which forms the focus of these objectives, the overall effect on wider environmental factors is expected to be neutral.</p>
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Matrix 4: Assessment of effects on key 'benefits and uses' from the aims of the Antonine Wall WHS Management Plan 2014 19:

Aims of the Plan	Aim 1: Safeguard and enhance the Outstanding Universal Value of the World Heritage Site by managing, conserving and protecting the site and its cultural and natural landscape setting	Aim 2: Promote awareness and understanding of this Outstanding Universal Value to local, regional, national and global audiences by improving physical and intellectual accessibility	Aim 3: Realise the World Heritage Site's full potential as an education and learning resource	Aim 4: Build strong structural and organisational partnerships with local, national and international organisations, strengthen engagement with local communities, and contribute to sustainable economic growth	Aim 5: Balance wider environmental concerns in the sustainable management of the World Heritage Site	Aim 6: Increase research opportunities nationally and internationally and use this new research to underpin work to protect and promote the World Heritage Site
Crosscutting benefits and uses of the Antonine Wall WHS (identified by stakeholders during development of the Plan)	↑	↑	↑	↑	○	↑
Educational resource/ outdoor classroom	↑	↑	↑	↑	○	↑
Historical connections to Europe and beyond	○	↑	↑	↑	○	↑
Recreation/leisure/ contribution to healthy lifestyle	○	↑	○	○	○	○
Local pride/community focus and cohesion/ sense of place	○	↑	↑	↑	○	○
Inspiration/arts (e.g photography)	↑	↑	↑	○	○	○
Foraging	○	↑	○	○	↓/○/↑	○
<p>Summary and recommendation No significant negative effects were identified for the crosscutting benefits and uses. There is some potential for the foraging uses of the site to be negatively impacted if they are not taken into account in the delivery of Aim 5 objectives. Aim 2 is strongest in achieving accumulated positive effects on these topics. The majority of the benefits and uses are expected to receive positive effects from an accumulation through the delivery of the objectives connected with Aim 5, but education and community have greatest accumulation of likely positive effects. Recommendation: that in delivery of aim 5, consideration is given to the value of the site for foraging; this could be done through the sustainability checklist.</p>						

ANNEX B – OTHER RELEVANT PLANS, PROGRAMMES AND ENVIRONMENTAL OBJECTIVES

SEA Parameter	Summary of Environmental Objectives	Plan, Programme or Plan
Biodiversity, Flora & Fauna	Biodiversity policies from international to local levels aim in particular to conserve habitats, species and ecosystems. Halting the decline of key species is important, and where possible remedial action and enhancement should be implemented in degraded areas. Policies also note the importance of an ecosystem approach – a holistic, landscape approach to biodiversity conservation that goes beyond the traditional emphasis on protecting individual sites.	Council Directive 79/409/EEC on the conservation of wild birds Council 92/43/EEC the conservation of natural habitats and of wild fauna and flora Wildlife and Countryside Act 1981 Conservation (Natural habitats &c.) Amendment (Scotland) Regulations 2007 Nature Conservation (Scotland) Act 2007 UK Biodiversity Action Plan Scotland's Biodiversity – It's In Your Hands
Population & Human Health	Policy outlines the need to seek to improve health and quality of life.	Improving Health in Scotland – the Challenge
Soil	Policies on soil seek to protect resources from a range of impacts, including soil sealing by development, increased susceptibility to erosion, soil pollution and compaction.	Scottish Soil Framework (2009) The State of Scotland's Soil [a report prompted by the Scottish Soil Framework 2009]
Water	Water related policies aim to protect water resources, and achieve an improvement in their ecological condition where appropriate. River Basin Management Plans, which were prepared under the Water Framework Directive and WEWS Act set specific objectives for the protection and improvement of water resources within each river basin.	Water Framework Directive 2000/60/EC Water Environment and Water Services (Scotland) Act 2003 (WEWS) Act Scotland River Basin Management Plan (2009)
Air	Air quality targets have been set at the European and UK levels. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland sets objectives for Particulate Matter (PM), oxides of nitrogen (NO _x), sulphur dioxide (SO ₂) and ozone (O ₃) amongst others. Good progress is being made towards meeting them.	2008/50/EC Directive on ambient air quality and cleaner air for Europe The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007)
Climatic factors	Policies focus on the need to cut greenhouse gas emissions. National targets are for an 80% reduction by 2050 making a contribution to climate change abatement targets set at the UK, EU and international levels. Energy policy highlights the importance of energy efficiency, and the need to achieve a shift from fossil fuels to renewable sources of energy. In addition the importance of adequate, planned adaptation to future climates is noted in order to increase the resilience of communities, and natural and economic systems.	UK Climate Change Act 2008 Climate Change (Scotland) Act 2009 Climate Change Delivery Plan (2009) Climate Change Adaptation Framework (2009) UK Low Carbon Transition Plan (2009) Conserve and Save: Consultation on the Energy Efficiency Action Plan (2009)
Cultural heritage	Historic environment policies aim to identify and protect historic buildings and sites from inappropriate development and damage. Policies extend beyond specific designated sites to reflect the value of wider townscapes, the setting of monuments and historic buildings, and wider cultural landscapes.	Scottish Historic Environment Policy (SHEP) 2011 Scottish Planning Policy (SPP) Managing Change in the Historic Environment Guidance Notes FRE (Antonine Wall) WHS Management Plan Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)

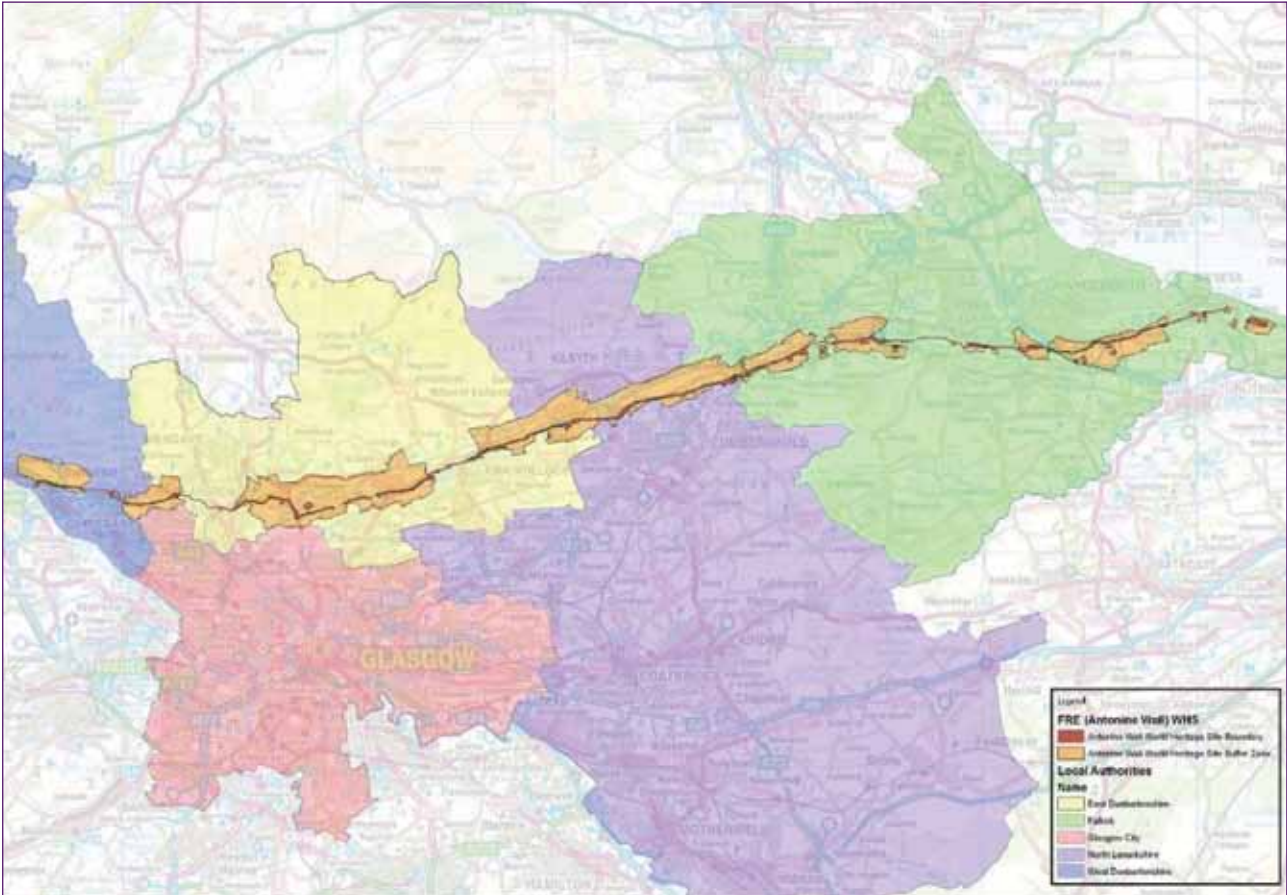
SEA Parameter	Summary of Environmental Objectives	Plan, Programme or Plan
<p>Landscape and Geodiversity</p>	<p>Landscape policies aim to not only safeguard protected areas, but to recognise and conserve wider landscapes. These may not be formally designated but make an important contribution to the quality of environment.</p> <p>Geodiversity is an integral and vital part of our environment. Scotland's Geodiversity Charter aims to maintain and enhance our geodiversity and increase understanding and awareness of its importance.</p>	<p>Council of Europe, European Landscape Convention (2000)</p> <p>SNH Natural Heritage Futures</p> <p>Section 263A of the Town & Country Planning (Scotland) Act 1997 [legislative framework for the National Scenic Areas Programme]</p> <p>Landscape Character Assessment reports for Scotland</p> <p>National Planning Framework 2 [strategic landscape objectives/Central Green Network]</p> <p>Scotland's Geodiversity Charter (2012)</p>
<p>Material assets</p>	<p>Agricultural and forestry policies promote sustainable land use, environmental protection and stewardship, and emphasise the importance of delivering public goods out with market mechanisms. Policy sets a target of increasing forest cover to 25% of land cover. The planning system highlights the need to allow the development of high quality, well designed, energy efficient housing. Efficient design will contribute to climate change abatement targets, as will transport emission reductions.</p> <p>Scotland's Zero Waste Plan (2010) sets out key actions, including new targets, to tackle the near 20 million tonnes of waste produced by Scotland every year. The two new targets that will apply to all waste are 70 per cent target recycle and maximum five per cent sent to landfill, both by 2025. Action 10 of the Plan recognises that energy from waste has an important role to play in the delivery of the Low Carbon Strategy and states that the Scottish Government will 'support the utilisation of renewable energy generated from resource management facilities thereby contributing to Scotland's renewable energy targets'. Energy from waste could contribute up to 31% of Scotland's renewable heat target and up to 4.3% of Scotland's renewable electricity target.</p>	<p>Scottish Forestry Strategy</p> <p>Strategic Transport Review Project</p> <p>National Transport Plan</p> <p>Local Housing Strategy</p> <p>Scottish Planning Policy</p> <p>A Vision for Scottish Agriculture</p> <p>The Zero Waste Plan for Scotland</p>

ANNEX C – BASELINE INFORMATION

The following sections highlight the key baseline information we have reviewed in determining the scope of our assessment. Information relating to all local authorities has been grouped under the environmental parameter.

We refer to Buffer Zones throughout this section. The Buffer Zones along the Antonine Wall have been defined in relation to local circumstances, including the landscape and modern features such as towns and villages, roads and railways. The aim is to protect the setting of the monument and, in this case, continue to allow understanding of why the Antonine Wall was erected in a particular location. The Buffer Zone is shown below in Figure 1.

Figure 1: Antonine Wall and its Buffer Zone in the context of the local authority areas through which it runs



Biodiversity, Flora and Fauna

Although covering a relatively small land area, Falkirk Council has a diverse range of habitats and species. The Local Biodiversity Action Plan identifies 6 priority habitats and 24 priority species. Predominant habitats within the area include rivers and streams, canals and other wetlands, quarries, spoil heaps, bogs and urban greenspace. Internationally important habitats within the area are the estuarine mudflats and salt marsh which form part of the Firth of Forth SPA, which is of international importance for wintering birds. The Forth and Clyde Canal has wildlife site status and the Union Canal has a number of Sites of Special Scientific Interest (SSSI) along its length.

Species of importance include wintering waders and wildfowl (such as bean geese, pink footed geese, shelduck, teal, dunlin, knot, redshank, curlew, and great crested grebe) and various other species in decline locally and nationally such as the water vole and skylark.

Designated Sites within Falkirk

Designation	No. of sites	Details
Special Areas of Conservation (SAC)	1	Black Loch Moss
Ramsar Site	1	Firth of Forth (adjacent to Buffer Zone 1)
Special Protection Area	1	Firth of Forth (adjacent to Buffer Zone 1)
Proposed SPA	1	Slamannan plateau (managed mainly for Bean Geese)
Sites of Special Scientific Interest (SSSI)	8	Avon Gorge SSSI within Buffer Zone 6
Wildlife Sites	65	Numerous sites within Buffer Zones, particularly 9 and 12
Sites of Importance for Nature Conservation (SINC)	28	Milnquarter SINC Buffer Zone 11. Glenyards SINC Buffer Zone 12.

There is no comprehensive information on the trends in the biodiversity resource, although Falkirk Council Sustainability Indicators (2004) indicate that for biodiversity there has been a trend or movement away from sustainable development. Threats to the resource in urban and urban fringe locations include development, predominantly housing and retail, and within more rural areas agricultural practices and tourism and recreational activities.

North Lanarkshire has a diverse range of habitats with a series of designated sites of European, national and local importance. The Local Biodiversity Action Plan (LBAP) identifies four habitats and 15 species of particular importance for conservation. The diversity of the ecological resource within North Lanarkshire is influenced by the variety in the geography and topography of the Council area.

Designated Sites within North Lanarkshire¹

Designation	No. of sites	Ha
Special Areas of Conservation (SAC)	4	211
Special Protection Area	1	520
Sites of Special Scientific Interest (SSSI)	13	1004
Local Nature Reserves (LNR)	3	115
Country Parks	3	934
Sites of Importance for Nature Conservation (SNC)	358	6257
RSPB Reserves	2	344
Scottish Wildlife Trust Reserves	5	344
Wildlife Sites (2 of which are SWT reserves and 8 of which are SSSI)	22	911

Designated Sites within the WHS Buffer Zone:

- Dullatur Marsh SSSI and SWT Reserve are within the buffer zone (this marsh is a remnant of the once extensive Kelvin Valley marshes, adjacent to the Forth and Clyde Canal);
- Dumbreck Marsh LNR is within the buffer zone (this is an area of grassland and woodland);
- There are several SINCS within the buffer area and the scheduled areas including Nethercroy SINC and Westerwood Ponds and Heath SINC; and
- Floodplain grazing marsh (which includes Dullatur Marsh SSSI and Dumbreck Marsh LNR) is identified as a priority habitat within North Lanarkshire and a Priority Action Plan has been drawn up to reverse further habitat loss and increase habitat area.

The following have been identified in the North Lanarkshire Biodiversity Action Plan and are relevant to the WHS area and Buffer Zone:

- **Barn Owl:** The SAP estimates that there are less than five pairs thought to remain within the countryside of North Lanarkshire, mostly located within the Kelvin Valley. In particular, for foraging, Barn Owls favour grassland and hedgerows.
- **Bluebell:** The SAP identifies that Bluebells are indicator species for woodland growing best on brown forest types on clay.

¹ North Lanarkshire State of the Environment 2005

A survey undertaken by North Lanarkshire Council in 1997 involving observations from members of the public revealed the plant to be most common in the Clyde Valley (Motherwell, Wishaw and Overtown), in relict woodlands in the Gartcosh/Coatbridge/Airdrie area, and in the glens around Cumbernauld and in the Kelvin Valley.

- Daubenton Bat: The SAP identifies that these bats are widely spread through river valleys within North Lanarkshire and are primarily associated with slow flowing water courses with wooded bankside vegetation.
- Great Crested Newts: Great crested newts favour standing water. A 1999 study reportedly found great crested newts present at nine waterbodies in North Lanarkshire, three main locations being Gartcosh Industrial Park, Drumcavel Quarry and Croy Hill.
- Otter: Otters are commonly found in almost all wetland habitats including lochs, rivers, burns, ditches, reedbeds and marshes. Otters require clean water with a plentiful supply of food and bankside vegetation.
- Small Pearl-bordered Fritillary: The SAP identifies that the preferred habitats are rushy grassland and wet rides or glades at the edges of moorland/woodland. Concentrations are noted from Kilsyth Hills to Harthill and around Croy Hill/Dullatur, to the south of Cumbernauld and in the Caldercruix-Hillend Reservoir area.

There are no European designated sites (i.e. SPAs, SACs) or Ramsar sites in East Dunbartonshire. However, the area contains a rich, diverse tapestry of locally important landscape features and wildlife habitats, including:

- 6 Sites of Special Scientific Interest (SSSI) (Cadder Wilderness SSSI is within Buffer Zone 14);
- 17 Gardens and Designed Landscapes;
- 66 Sites of Importance for Nature Conservation (SINCs) (Buffer Zones 13 and 15);
- A network of wildlife corridors and undesignated open spaces of varying size (Important Wildlife Corridors within Buffer Zone 13 include: route of the Forth and Clyde Canal; River Kelvin and tributaries; route of dismantled railway; Buffer Zone 14: River Kelvin; Cadder Wilderness; Forth and Clyde Canal).

The East Dunbartonshire Local Biodiversity Action Plan (LBAP) identifies 23 priority species and 13 broad

habitats for conservation action. The habitats include farmland (general, hedgerows, arable), the Forth and Clyde Canal, golf courses, urban, wetlands and woodland. The plan also identifies a further 4 habitats of conservation concern (blanket bog, quarries, bings, sandpits, reedbed and scrub).

The network of green and open spaces within Glasgow supports a range of biodiversity. The biodiversity resource includes:

- 5 sites of special scientific interest (SSSI);
- 11 corridors of wildlife and/or landscape importance;
- 5 local nature reserves (LNR);
- 36 citywide sites of importance for nature conservation (C-SINC);
- 39 local sites of importance for nature conservation (L-SINC);
- Areas of ancient, long established or semi-natural woodland and numerous tree preservation orders; and
- 3 historic gardens and designed landscapes.

Within Buffer Zone 14 there is the River Kelvin Landscape and Wildlife Corridor, the Millichen Flood SINC and the Summerston Site of Special Landscape Importance. Within Buffer Zone 15 there is Garscadden Wood SINC and part of the Garscadden Wood Proposed LNR. The Garscadden Wood area is also within the boundary of a Site of Special Landscape Importance.

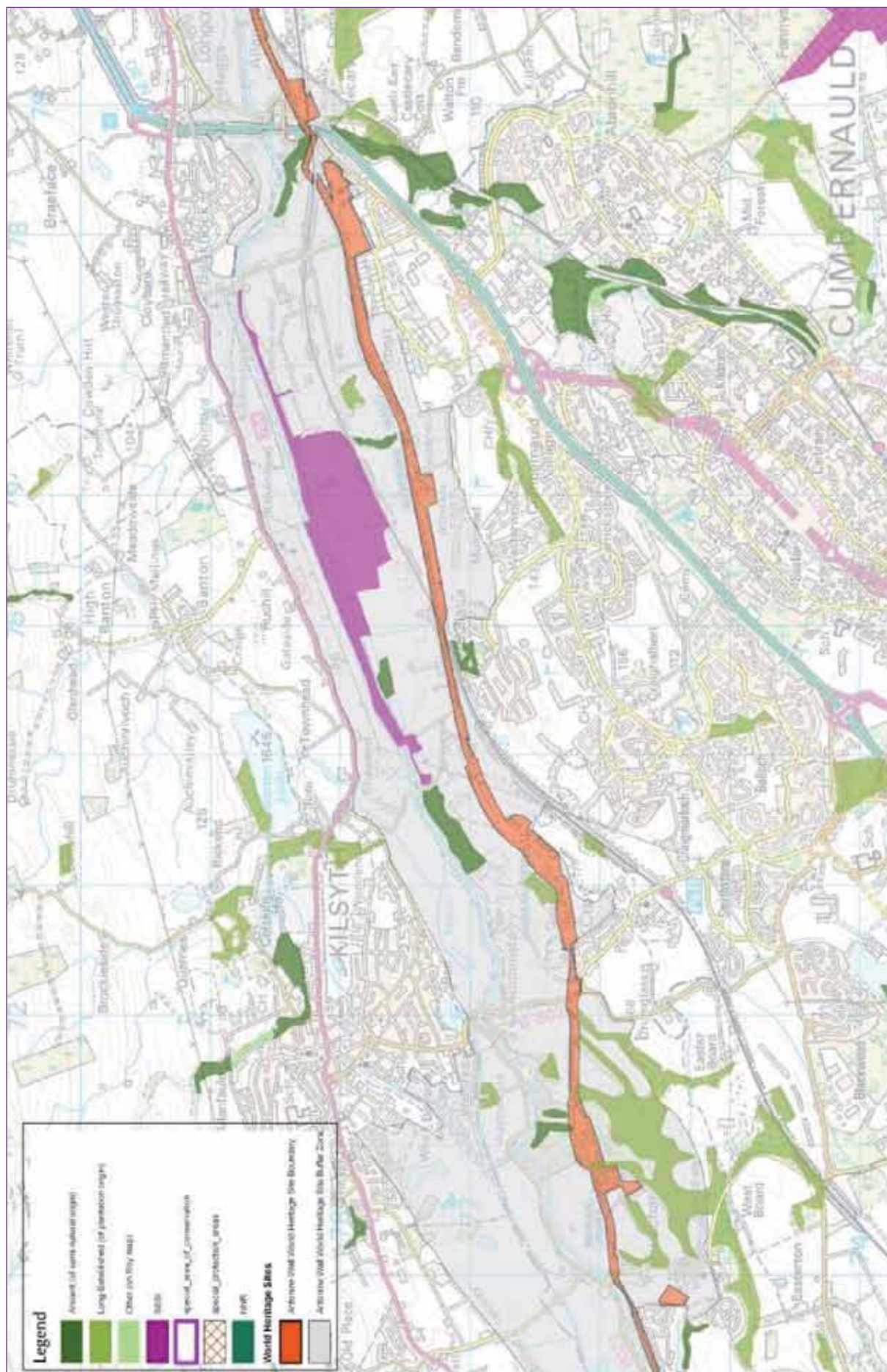
Designated sites within West Dunbartonshire:

Designation	No. of sites
Special Protection Area	1
Ramsar Site	1
Sites of Special Scientific Interest (SSSI)	8 (Buffer Zone 17: Hawcraigs SSSI and Glenarbuck SSSI)
Local Nature Reserves (LNR)	1
Sites of Importance for Nature Conservation (SNC)	48

Additionally, the Kilpatrick hills (Buffer Zone 17) with Dumbarton Muir to their north provide a large area of upland moorland for a variety of species. The map below illustrates the location of designated sites in relation to the Antonine Wall and Buffer Zone for all local authority areas.

Figure 2: The Antonine Wall in relation to heritage assets

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Landscape and Geodiversity

Scotland has a rich variety of landscapes, not limited to places where there has been no development. More than one million hectares are designated as National Scenic Areas, reflecting areas of the highest landscape value and National and Regional Parks afford protection to scenic areas of national and regional importance, respectively. Landscapes are dynamic, shaped by the interaction of natural processes and human activities. They can be strongly influenced by built development and land management.

Landscapes are a key part of our cultural heritage having huge economic potential and are a vital part of our sense of place and general well being. Scottish Planning Policy requires consideration of development impacts on landscapes and emphasises the importance of a sympathetic approach. Consideration should be given to landscapes outwith designated areas and should be managed to safeguard and enhance their distinct identity. Designated areas should be managed in such ways that are consistent with safeguarding their scenic value. The Antonine Wall stretches from the coastal landscape at Bo'ness through the broad valleys and agricultural farmland, to Glasgow and West Dunbartonshire. Three Areas of Great Landscape Value (AGLV) cover the surrounding upland and valley landscapes of the Antonine Wall within Falkirk council area. The pace and scale of landscape change has increased with technological progress. Pressures on the landscape include insensitive development, development pressure in the urban fringe (particularly Falkirk and North Lanarkshire) and wide scale visual effects such as wind farms.

Geodiversity is a vital and integral part of our natural heritage and environment, and is important in maintaining and enhancing many other elements of Scotland's natural resources, including biodiversity, soil and landscape. The geological diversity which is found along the length of the Antonine Wall WHS has value in terms of the role it plays in the functions of the natural environment as a whole, and in terms of the educational opportunities it offers. Scotland's Geodiversity Charter sets out future actions for increasing conservation, enhancement, understanding and awareness of Scotland's rich geodiversity resource.

Cultural Heritage

Scotland has five² World Heritage Sites, over 47,000 listed buildings and more than 600 conservation areas. 386 sites are currently identified in the Inventory of Gardens and Designed Landscapes. The actual extent of archaeological remains in Scotland is unknown with 8,151 Scheduled Monuments representing only a small proportion of the archaeological sites for which the **Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS)** holds records and the myriad of unrecorded and unknown sites throughout the country.

Designation helps to protect important aspects of our cultural and historic environment by ensuring that they are considered in the management of change introduced by development. It is important that consideration goes beyond the designated buildings and sites to reflect the value of wider townscapes, the setting of historic resources and wider cultural landscapes, including the Antonine Wall.

In July 2008, the international cultural and archaeological importance of the Antonine Wall was recognised when the World Heritage Committee of **UNESCO**³ inscribed the site as Scotland's fifth World Heritage Site (WHS). The Antonine Wall then became an extension of the trans-national Frontiers of the Roman Empire World Heritage Site (FREWH) which already includes Hadrian's Wall in England and the Upper Raetian German Limes. The intention is that the WHS will eventually include all surviving sections of the frontiers of the Romans in Europe, Africa and the Middle East.

The Antonine Wall is of great significance for a number of reasons. It represents one of many sections of a massive military system which stretched over 5000 km from northern Britain, through Europe to the Black Sea, and from there to the Red Sea and across North Africa to the Atlantic coast. This frontier helped to protect – and define – the Roman Empire, one of the greatest states ever to have existed. The Antonine Wall was the most northerly frontier of the Empire, the last of a series of planned frontiers built in the second century AD and, at the time, the most complex ever constructed by the Romans.

2 New Lanark, Edinburgh Old and New Towns, St Kilda, The Heart of Neolithic Orkney, The Frontiers of the Roman Empire (Antonine Wall)

3 United Nations Educational, Scientific and Cultural Organisation

The Antonine Wall runs through the northern part of North Lanarkshire, from Castlecary in the east to Croy Hill in the west. This is one of the most visible sections of the Wall, as it passes along the south side of the Kelvin valley and over the hills. As a result, the Wall has a particularly strong presence in the surrounding area. Other features of interest include the Forth and Clyde Canal, colliery pits and a foundry. There are numerous listed buildings, including a number within the buffer zones of the Antonine Wall.

The parts of the Antonine Wall in Falkirk include the best surviving stretches of the rampart, ditch, outer mound and Military Way, the best surviving fort and annexe earthworks, some visible remains of the stone-walled fort at Castle Cary (the only visible fortlet). The area also includes nine Conservation Areas and numerous listed buildings, many of which are within the WHS buffer zones.

Within East Dunbartonshire the Antonine Wall and the Roman Bathhouse in Bearsden are two of the most important Roman relics. The best evidence of the wall can be seen at New Kilpatrick Cemetery, Bearsden, where the stone base is clearly visible. The ditch to the north of the rampart can be seen to best effect at Bar Hill, Twechar. The Antonine Wall buffer zone includes listed buildings, conservation areas and townscape protection areas.

The Antonine Wall can be found in two locations in Glasgow to the northern edge of the City boundary at Summerston and Drumchapel. Other sites of importance include the Forth and Clyde Canal. West Dunbartonshire contains the western terminus of the Antonine Wall. The area of the wall within West Dunbartonshire runs from Cleddans Burn in the east, to Duntocher and ends in Old Kilpatrick at the Gavinburn Roman fort. Other sites of importance include the Forth and Clyde Canal.

With World Heritage Site status comes a commitment to protect the exceptional cultural significance of the Antonine Wall and Outstanding Universal Values (OUV) for which the site was inscribed. It is imperative that development does not compromise the values for which the Antonine Wall was inscribed as a World Heritage Site, nor its authenticity or integrity.

Population and Human Health

The environment provides a variety of services that are beneficial to human health including opportunities for education and recreation. Access to historic environment sites, forests, woodlands and nature conservation sites as well as the wider environment can help to promote healthier lifestyles having positive effects on both physical and mental health.

The Antonine Wall is therefore an important resource for education, recreation and tourism, allowing visitors to experience and understand the site first hand. The quality of the environment in which we live can also impact on our quality of life. High quality urban environments, including natural landscapes can create a sense of place, influencing well being. For these values to be retained the Antonine Wall needs to be managed in a sustainable way to ensure that the positive and distinctive contribution it can make to our landscape, sense of history and identity, sense of place and well being can be realised.

The FRE (Antonine Wall) WHS and buffer zone is typically close to fairly densely populated areas. Recently, the area close to the Antonine Wall in North Lanarkshire has experienced change through recent releases of housing land. This has resulted in some significant population increases at Croy, Gartcosh and Dullatur. Unemployment is below the Scottish average in Falkirk and East Dunbartonshire, but with higher than average levels in North Lanarkshire, Glasgow and West Dunbartonshire. This trend is reflected for the local authorities in lower average life expectancy, and higher levels of poor health and multiple deprivation.

Soil

Soils are an important natural asset on which life depends. They perform a wide range of essential environmental, social and economic functions, such as growing food, controlling the quality and quantity of water flow, and storing carbon⁴. Scottish soils are distinguished by their high organic content, water content and leached character⁵. Soil also protects archaeological remains and provides a record within it of previous cultivation and improvement and, therefore, of the historical development of landscapes and societies.

4 The State of Scotland's Soils, SEPA Report (2011): www.sepa.org.uk/land/soil.aspx

5 Scottish Soil Framework: www.scotland.gov.uk/Publications/2009/05/20145602/13

Within Falkirk the soil resource varies from higher quality agricultural land in the valley lowlands to the poorer soils of the more elevated areas. For example, the large rural area of the Slamannan plateau and smaller outliers around Denny, to the north at Airth and east of Polmont, support a largely open agricultural landscape. To the west, the soils are typically of lower quality for agriculture. There is a high percentage of agricultural land considered to be of high quality with land capability for agriculture classes 2 to 4 (wide to narrow ranges of crops) occurring throughout the lower lying areas of the Forth estuary and Carron Valley.

All of the local authority areas have a long history of industrial activity. Each has a legacy of vacant, derelict and contaminated land to varying degrees. Trends in the quantities of vacant and derelict land are uncertain, as there have been recent phases of re-development. Development pressure (including agricultural land management, forestry and industrial operations) is identified as the key threat to soils.

Water

The new framework as a result of the Water Framework Directive 2007 and the Water Environment and Water Services (Scotland) Act 2003 has resulted in greater protection and an improvement in water quality. This includes new regulatory regimes and a new monitoring and classification system along with River Basin Management Plans to ensure environmental objectives for all water bodies.

There are over 220 km of rivers, streams and ditches with flowing water in the area. There are two major river catchments – the River Carron and the River Avon. The two canals (the Forth and Clyde and the Union) also perform a significant land drainage function. Other considerable bodies of open water include the Black Loch, Loch Ellrig, and artificial reservoirs at Drumbowie and Denny.

Coastal flooding is an issue along the estuary, with particular implications for the Falkirk area (Grangemouth and Bo'ness) given the prospect of sea level rise (Buffer Zones 1 and 3). There are localised flooding problems associated with a number of other watercourses in the area including the River Avon around Polmont and the Bonny Water (Buffer Zone 12) and Forth and Clyde Canal around Bonnybridge, Higgs and Longcroft. SUDS are now routinely used for surface water treatment and/or attenuation in new development.

Restoration work on the Forth & Clyde and Union Canals involved their dredging and decontamination, and a consequent improvement in quality.

North Lanarkshire lies predominately within the River Clyde catchment with part of the area draining eastwards to the Firth of Forth. North Lanarkshire Council's flooding report (2003) notes that there are approximately 89 rivers and burns, two main canals and 35 lochs and reservoirs.

Pollution of surface waters within North Lanarkshire is also likely due to the extensive historical underground coal mine industry and the potential for rising mine water levels associated with cessation of mine water pumping. Within North Lanarkshire flood risk areas are identified mainly along River Kelvin, North Calder Water and South Calder Water.

East Dunbartonshire is bisected by the River Kelvin, its tributaries and the Forth & Clyde Canal. The Kelvin is a tributary of the River Clyde. The main tributaries of the Kelvin include the Glazert, the Luggie and the Allander Waters. There are no SEPA groundwater monitoring boreholes within East Dunbartonshire, however there are several groundwater bodies intersected by this area. The primary pressure on groundwater in this area is diffuse pollution from agriculture. There are 45 stretches of water monitored by SEPA for water quality of around 137km.

East Dunbartonshire has suffered from flooding over a number of years. The most recent significant flooding event was in January 2005, caused by very heavy rain. The main concern for flooding in East Dunbartonshire Council is the River Kelvin (and occasionally tributaries – the Glazert and Luggie Waters). The River Kelvin floodplain takes up much of the central area of buffer zone 14. There is an identified potential risk of flooding where the River Kelvin crosses the route of the Antonine Wall on the A807 and on the watercourse which crosses the Antonine Wall at Cadder.

East Dunbartonshire Council has completed a strategic flood defence scheme at the Kelvin, Luggie and Glazert river systems. These have been designed as a minimum to protect existing built up areas from the effects of a predicted '100 year flood event'. In most areas the defence scheme has actually been designed to more than accommodate a '200 year flood event', such as that seen in the area in 1994. The Milngavie reservoirs and Woodburn reservoir are of significant value and there are a number of small dams throughout the area.

The main bodies of water and watercourses in Glasgow City are the River Clyde (which is tidal up to the Weir at Glasgow Green), the Forth and Clyde Canal, the White Cart Water and the River Kelvin. The water quality of the rivers and Canal is regularly monitored by SEPA.

The major watercourse in West Dunbartonshire is the River Leven, an important wildlife corridor linking the Clyde Estuary into Loch Lomond and beyond into the Highlands. Feeding into the Clyde Estuary, the Leven is tidal from around Dumbarton Golf Course and is a nationally important migration route for Atlantic Salmon, Sea Trout and Sea Lamprey. On the lower reaches of the River Leven and Clyde Estuary, mudflats are exposed at low tide and extend along until Milton (on the north side). These have been designated as a Site of Special Scientific Interest (SSSI), Ramsar Site and Special Protection Area (SPA). The Forth & Clyde Canal has its westerly point in West Dunbartonshire and is a key wildlife corridor in the area, along with the Cochno and Duntocher Burns. Duntocher Burn, which runs close to Buffer Zone 16, was classified in 2011 as having overall poor ecological value. The SEPA flood map also indicates that there is a risk of flooding from the Duntocher Burn.

Air Quality and Climatic Factors

Information provided within the Department of Environment, Food and Rural Affairs (DEFRA) Inventory of Greenhouse Gases provides a summary of the key trends in emissions that have occurred between 1990 and 2002 for the key main greenhouse gases. Overall there has been a decrease in greenhouse gas emissions across the United Kingdom with the majority of greenhouse gas emissions decreasing within Scotland. No figures are presented on emissions within different areas of Scotland.

Although Government targets for some pollutants have been met within the Falkirk Council area, several have been exceeded and these include sulphur dioxide, nitrogen dioxide and also particles of PM₁₀. Air quality is largely affected by the industries in Grangemouth, although air quality is monitored carefully in this area, and Longannet Power Station which can produce high sulphur dioxide levels depending on the wind direction. An increase in car ownership and the impact of traffic on the two motorways that traverse the Council area also have an effect. The Sustainable Falkirk Indicators (2004) however show a trend or movement towards sustainable development for air quality.

The air quality varies across North Lanarkshire with predicted background concentrations of the key air pollutants highest in the urban areas and key transport routes. Road traffic emissions play an important role in the air quality and North Lanarkshire Council have identified three areas as Air Quality Management Areas where further monitoring and action is required, these being parts of Airdrie, Chapelhall and Motherwell.

There are a range of emissions sources that contribute to local air quality within North Lanarkshire. In summary these include:

- Vehicle Emissions;
- Other Transport Emissions (such as railways, rail depots and airports);
- Domestic Fuel Burning;
- Industrial Activities (including quarries etc); and
- Regional, National and Global Sources (including nearby conurbations such as Glasgow).

The contribution from traffic sources is generally considered to be the most significant and data exists within North Lanarkshire for traffic figures on the main road network.

Overall air quality in East Dunbartonshire is good. However, a corridor along the A803 through Bishopbriggs has been designated as an Air Quality Management Area (AQMA). This is currently the only AQMA in East Dunbartonshire, having the highest predicted level of PM₁₀ and Nitrogen Dioxide. In common with most local authorities, the main source of air pollution in East Dunbartonshire is transport related. Correspondingly the 'hotspots' for air pollution are located at busy road junctions. The busiest roads that are of concern in relation to air quality are the A803 and B812 at Bishopbriggs; the A81 through Milngavie; the A809 and A739 through Bearsden.

Locally, there are a number of factors that contribute to climate change, particularly transport emissions and energy consumption. In 2006-07, the Council's carbon footprint was 34,991 tonnes⁶. While the Council already takes various actions to reduce the use of energy and fuel in its own activities, there are opportunities for doing significantly more to cut carbon emissions and associated costs. The indicators for consumption within East Dunbartonshire are higher than the Scottish average and the travel to work method is predominantly the private car.

6 www.sustainable-scotland.net/documents/6991_East_Dunbartonshire_Council_SIP.pdf

The increase in traffic volumes is creating issues concerning air quality in some parts of Glasgow City. In the City Centre, nitrogen dioxide and particulate matter emissions exceed recommended levels. As a consequence, and as required under the Regulations, the City Centre has been declared an Air Quality Management Area (AQMA). An Air Quality Action Plan has been prepared by the Council. This sets out actions to achieve a reduction in the emission levels in this area. These measures include local transport management schemes, implementation of quality bus corridors and the development of travel plans.

The SEA undertaken for the Joint Structure Plan Alteration 2006 indicates that Glasgow's ecological footprint compares reasonably favourably with other UK cities, and is better than all the other Scottish cities. The Council is committed to promoting renewable energy projects but as Glasgow is predominantly urban, it is likely that most renewable energy sources within the City will be small-scale wind, solar, waste biomass and hydro projects.

There are two permanent air monitoring stations in West Dunbartonshire. The West Dunbartonshire Council Air Quality Progress Report 2008 (based on 2007 monitoring) states that air quality within the West Dunbartonshire Council area remains good with only one nitrogen dioxide result breaching the National Objective levels (this was at Milton)⁷.

In terms of climate, transport contributes significantly to greenhouse gas emissions from the West Dunbartonshire area. Traffic congestion is also a major problem in the WD area particularly in town centres and on the A82 – the main trunk road in the area.

Material Assets (Minerals)

Mineral extraction has diminished in recent times, with activity currently limited to hard rock quarrying in the west, sand and gravel extraction in the Falkirk area (near Polmont) and some peat extraction at Letham Moss. However, there are still exploitable coal reserves within Falkirk.

Deep coal has been mined in the area, under the Forth from Longannet Mine Complex however this, the last deep mine in Scotland, closed in 2002. There are no active opencast workings in the area, although significant reserves of shallow opencast coal areas remain. Overall this activity has subsided since the 1980s when 13 sites in the Council area were being worked simultaneously. Sand and gravel is worked near Polmont (Avondale Quarry – this is within Buffer Zone 6), but resources are limited. There is a good supply of hard rock aggregates found in the west of the area and this is worked near Denny (Northfield Quarry and the Boards Quarry), and Banknock near Bonnybridge (Cowdenhill Quarry).

There are two mineral working sites in East Dunbartonshire: Inchbelly, sand quarry, (Buffer Zone 13) and Douglas Muir (sand and gravel quarry) to the west of the area.

The legacy of the minerals industry and old industrial workings affects many areas in Glasgow. This includes shallow stoop and room mine workings that are rapidly decaying, leading to subsidence, contaminated land (particularly in infilled quarries), and polluted groundwater. Old mine workings have been capped. (Source: British Geological Survey Natural Environment Council – www.bgs.ac.uk). There is evidence of disused workings within Buffer Zone 14 at Balmuildy.

There are a number of quarries (disused and active) in West Dunbartonshire such as Bonhill Quarry, Dalreoch Quarry, North Lodge Quarry, Carman Muir Quarry, Dumbain Quarry and former sites at Dalmonach and Drumkinnon. These mainly supply aggregates.

The geology of North Lanarkshire provides a range of natural resources that are and have been mined and worked. This includes reserves of coal along with deposits of gravels. Key areas for underground mining included the northern area along the River Kelvin valley around Kilsyth. The Land Use Survey undertaken by North Lanarkshire Council in 2004 identified 1,814 ha of mineral workings and quarries – this is approximately 4% of North Lanarkshire's area (however this does not specify which sites are active). There are several disused quarries within and surrounding the WHS buffer zone. Aggregate quarrying takes place at Croy Quarry which is within the buffer zone.

7 West Dunbartonshire Council Air Quality Progress Report 20085 (online)

Material Assets (Energy)

At present there are no large-scale commercial renewable energy developments within the Falkirk area and the Falkirk Council Renewable Energy Study (2003) concluded that there is limited potential for large scale renewables generation in the area. Key findings included the potential for small scale commercial and community projects subject to key constraints (e.g. migratory birds). For wind energy of approximately 10kw the following locations were identified: the Denny Hills, Slamannan Plateau (avoiding the Bean geese migrating population) and Letham Moss. In addition it was identified that biomass may have commercial potential and hydro has very limited community scale potential (e.g. micro-HEP project at Muiravonside). A number of smaller scale carbon management projects are however underway and these include:

- Callendar house district heating scheme;
- Limeriggs woodchip/biomass project;
- Grangemouth district heating scheme; and
- Avondale landfill site methane harvesting.

The Sustainable Falkirk Indicators (2004) noted no discernable change or an unclear trend in the Climate Change Renewable Energy Indicator based on data from 1998-2003.

With the exception of Black Law wind farm, there are no major energy generation projects within North Lanarkshire and therefore the majority of energy supply is obtained from plants outwith the area. There are a number of small scale projects including landfill sites producing energy from landfill gas and the consideration of biofuel generation. It is likely that the supply of energy from renewable sources will continue and areas to the south and east of North Lanarkshire have been identified as providing potential for wind energy generation (this is not within the WHS area).

The aim of the East Dunbartonshire Carbon Management Programme Strategy and Implementation Plan is to achieve a 25% reduction in carbon emissions between 2008 and 2013. Carbon cutting actions include a number of individual renewables projects and these include a private dwelling air source heat pump; a school wind turbine and consideration of ground-source heat pump or wood chip boiler for remote educational establishment⁸.

8 www.sustainable-scotland.net/documents/6991_East_Dunbartonshire_Council_SIP.pdf

Despite Glasgow's urban nature, potential exists for renewable energy generation particularly through small-scale wind, hydro and geothermal projects. Some examples of the type project under consideration in Glasgow are:

- wind projects such as the development of buildings integrated wind turbines;
- investigation/trial of alternative vehicle fuels from renewable sources.

Energy capture takes place at the Summerston Landfill site within Buffer Zone 14. The power generated from the utilization of the landfill gas is supplied to Scottish Power⁹.

There are no major energy generation projects within West Dunbartonshire, however the potential for wind generation is acknowledged. The Local Plan states that any proposals must not be to the detriment of key environmental resources such as the Kilpatrick Hills. The West Dunbartonshire Local Plan also states that 'proposals for micro-renewable technologies to reduce predicted CO₂ emissions in new developments will be encouraged where they can be satisfactorily accommodated into their surroundings without adverse impact on residential amenity and the historic and built environment'.¹⁰

Material Assets (waste)

In terms of waste production, figures from 1996-97 to 2003-04 show a marked increase (21% over a 7-year period, or an annual increase of 3%). The bulk of household and commercial/industrial waste is landfilled with only 7.3% of household waste being recycled in 2001-02. Rates of recycling however did increase by 4% between 2002-03 and 2003-04.

The main waste management sites in the Falkirk area are:

- **Kinneil Kerse** – an unlined site that has accepted a range of active, inert and liquid waste. Now restricted to inert material as part of long-term restoration plan (north of Buffer Zone 6).
- **Avondale** – a modern lined facility and is licensed for household, commercial, industrial and some special wastes. It involves the infilling of land formerly used for sand and gravel quarrying (within Buffer Zone 6).

9 www.esru.strath.ac.uk/EandE/Web_sites/04-05/landfill/case_study22.html

10 West Dunbartonshire Local Plan Finalised Draft (August 2007).

- West Carron – accepts commercial and industrial waste.
- Roughmote transfer facility.

The Sustainable Falkirk Indicators (2004) show that for the indicator of Waste Production and Recycling Rates there was a trend towards sustainable development based on data from 1996-97 – 2003-04.

Data on Municipal Solid Waste (MSW) arisings within North Lanarkshire comes from the Audit Scotland report on Local Authority Performance Indicators for 2003-04 (Issued February 2005). This identifies that in 2003-04 North Lanarkshire Council collected 200,000 tonnes of household, commercial and industrial waste, of this 14.7% was recycled and composted which compares with the Scottish average of 12.3% for the same period. The remaining 85.3% was disposed to landfill. Data relating to Non-Municipal Wastes (construction and demolition, waste tyres, end of life vehicles) is limited as there is no requirement for organisations to report non-municipal waste to SEPA.

The network of waste management facilities within North Lanarkshire includes two municipal landfill sites which also receive waste from other areas (at Auchinlea and Greengairs), a recycling centre (also at Auchinlea), 70 recycling points and an extensive kerbside recycling scheme for paper, garden waste and glass. In addition there are also 57 closed landfills within North Lanarkshire. None of the principal waste management facilities however are within the WHS buffer zone.

Overall, figures show that there has been a steady increase in the quantities of Municipal Solid Waste being generated within North Lanarkshire; however it is likely that increased recycling rates required by legislative targets will help diversion from landfill.

East Dunbartonshire Council currently exports most of the household and commercial waste that it collects to landfill sites outside the Council area. The only active landfill site is the former sand quarry at Inchbelly, Kirkintilloch (Buffer Zone 13). Under the requirements of the EU Directives and the Area Waste Management Plan, the Council is seeking to increase the amount of waste that is recycled or reused within the local area, by reducing the waste that is produced and by providing improved recycling facilities.

Glasgow disposes of its waste mainly at the Cathkin Landfill site, located in South Lanarkshire. This facility has planning consent until 2013. The Council operates four civic amenity waste transfer stations in Glasgow,

located at Dawsholm, Easter Queenslie, Polmadie and Shieldhall. The Polmadie plant also deals with reclamation and processes up to a maximum of 25,000 tonnes of material annually, such as paper, food and drink cans. In addition, there are around 300 multi-purpose recycling sites located throughout the City. These provide recycling facilities to dispose of items, such as paper, magazines, cans, glass, garden waste, batteries and textiles. The amount of recycling in Glasgow is increasing. The Summerston landfill site, which closed in 2002, lies within Buffer Zone 14. Landfill gas is recovered at the site.

According to the SEPA Waste Data Flow Annual Report for West Dunbartonshire 2007-08 a total of 40,573 tonnes was landfilled by or on behalf of West Dunbartonshire Council in 2007-08, no incineration or energy recovery took place. There are 2 landfill sites in operation within the West Dunbartonshire boundary.

The recycling and composting rate for West Dunbartonshire Council in 2007-08 was 32.4%. West Dunbartonshire Council operates 45 recycling points and 3 recycling centres within the local authority area.

Material Assets (tourism)

The importance of the tourism sector in Falkirk has grown over recent years. Key attractions are the Falkirk Wheel (Buffer Zone 9) and both of the canals. Other attractions include stately homes (Kinneil House, Buffer Zone 6 and Callendar Park Buffer Zone 8), museums and the Bo'ness and Kinneil Railway (Buffer Zone 6). The Sustainable Falkirk Indicators (2004) show a growth in tourism numbers between 2002 and 2003, most likely due to new attractions such as the Falkirk Wheel and the canal infrastructure.

The tourism resource in North Lanarkshire includes museums and parks, gardens and country parks. Within the WHS area the Kilsyth Hills and Kelvin Valley are key recreation resources. The Kilsyth Hills provide a resource to the local communities and also the wider population of North Lanarkshire. Woodlands and forests are also an important community facility for access to open space, health and wellbeing. The extent of access to woodlands and forests varies however there are many locations where public access is provided and actively facilitated. The Country Parks in North Lanarkshire are particular locations where extensive woodland has public access through networks of footpaths. The Central Scotland Forest Trust is also working to increase the woodland cover of North Lanarkshire and public access is a key objective for all woodlands.

The canal is also important community resources through its role as accessible open space and for the recreation, health and wellbeing role. Footpaths along both canals are managed and the Forth and Clyde Canal forms part of the millennium link between Glasgow and Edinburgh. Urban parks comprise a key part of the local recreation resource and within North Lanarkshire there are 43 urban parks, this includes Auchinstarry Quarry which is within the WHS buffer zone.

Tourism in East Dunbartonshire is based largely around attractions such as the West Highland Way, the Campsie Fells, Roman heritage and the Forth & Clyde Canal. The Auld Kirk Museum in Kirkintilloch has interpretation relating to the Roman heritage of the Antonine Wall. These attractions are some of the area's key selling points and form the basis of its tourism product. East Dunbartonshire is also popular for weekend and short breaks due to its proximity to Glasgow and other major centres such as Stirling and East Dunbartonshire.

The West Dunbartonshire Council's Tourism and Hospitality Strategy states that tourism in West Dunbartonshire generates an estimated £94.46 million and attracts approximately 968,000 visitors per annum. Visitors to the area tend to be typically transient visitors or short break visitors with families. Important tourism resources include those relating to heritage themes such as the Clyde Waterfront. Other recreation resources include National Cycle Route No 7, the Forth and Clyde Canal and the Kilpatrick Hills.

Tourism within Glasgow includes a variety of culture related activities such as museums, galleries, architecture and history. The Hunterian Museum has a dedicated Antonine Wall display which re-opened in September 2011. The parks and gardens of the city are also popular for recreation. The Kelvin Walkway long-distance route goes through Summerston in Buffer Zone 14.

Woodland/Forestry

Overall woodland cover is 8% of land area with broadleaved woodland contributing 3.35%. This relatively rare resource is locally important and occurs in small, fragmented pockets. The Central Scotland Forest covers the entire area, and while tree coverage is presently small in area, planting is actively promoted. There are limited, but significant, areas of ancient or long-established woodland which include:

- 27 Ancient Woodlands (including those within Buffer Zone 6 and 9);
- 5 Long established woodlands (semi-natural origin);
- 26 Long established woodlands (plantation origin); and
- There are 49 designated Tree Preservation Orders (TPOs).

There is a range in the nature and extent of forestry and woodland within North Lanarkshire. This includes commercial plantations and natural native woodland with significance for nature conservation. Within the central belt of Scotland there is extensive forest / woodland cover with the Central Scotland Forest Trust (CSFT) and the Forestry Commission (FC) undertaking to manage and promote woodland for a range of social, economic and environmental purposes. Significantly, much of the WHS lies within areas identified as being significant components of the Forest Habitat Network.

Throughout North Lanarkshire there are urban areas, many villages and towns having been established alongside industrial activities such as coal mining and steel making. Large settlements are now focussed in the south-western and central parts of North Lanarkshire generally on areas of lower lying land. Growth of urban areas has also been affected by the use of North Lanarkshire's towns as commuter settlements for Glasgow in particular. The Glasgow and Clyde Valley Structure Plan identifies an anticipated rise in household numbers.

The Forest Habitat Network (FHN) is extensive within East Dunbartonshire. Within Buffer Zone 13 Barr Hill wood and the Kelvin/Forth and Clyde canal corridors are major aspects of the forest habitat network in the buffer zone. Much of the WHS lies within areas identified as being part of the FHN. Within Buffer Zone 14 significant areas are also part of the FHN including Cadder Wilderness.

Significant areas of Buffer Zone 14 are included within the Forest Habitat Network most notably within the Glasgow City boundary, these are: West Barmuidy and route of the Kelvin. Garscadden Wood (Buffer Zone 15) is also within the Forest Habitat Network. Buffer Zone 14 is also a preferred area for woodland expansion in the GCV Structure Plan indicative forestry strategy.

The broadleaved woodlands of West Dunbartonshire have undergone a dramatic transformation in recent times due to agricultural and developmental pressures. In upper valleys, extensive woodland has been reduced to patches along river banks and streams, while lower valley forests have suffered as a result of urban development. Buffer Zone 17 includes significant components of the Forest Habitat Network (FHN); however these are more fragmented in the immediate vicinity of the wall.

Large scale afforestation has not occurred within the Falkirk area although recent years have seen an increasing number of woodland initiatives including the Forestry Commission's Forest Habitat Network and the Central Scotland Forest. The Forest Habitat Network is well spread throughout the Falkirk Council area and includes large areas of Buffer Zones 3, 6 and 9. Buffer Zone 6 also lies within the Falkirk Structure Plan Potential Area for Forest Expansion.

