Assessment of the Impact on Archaeology of the Proposed Hadrian's Wall National Trail

April 1992
Hadrian's Wall National Trail Archaeology of the Proposed Assessment of the Impact on
Cumbria's Commission / English Heritage

April 1992
## CONTENTS

### EXECUTIVE SUMMARY

### 1 INTRODUCTION

1.1 **Purpose of the Report**  
1.2 **Hadrian's Wall**  
1.3 **Hadrian's Wall National Trail**  
1.4 **Scope of the Report**  
1.5 **Layout of the Report**

### 2 SOURCES OF INFORMATION

2.1 **Introduction**  
2.2 **Archaeological Sources**  
2.3 **Landform Sources**  
2.4 **Visitor Numbers**  
2.5 **Management Prescriptions**

### 3 CLASSIFICATION OF ARCHAEOLOGICAL FEATURES IN RELATION TO SENSITIVITY TO VISITOR DAMAGE

3.1 **Introduction**  
3.2 **The Model**  
3.3 **Stage 1: Assessment of Physical Vulnerability Index**  
3.4 **Stage 2A: Assessment of Control Factors**  
3.5 **Stage 2B: Assessment of Sensitivity Index**  
3.6 **Stage 3: Assessment of the Effects of Visitors and Prediction of Management Routine**  
3.7 **Checking of the Model**  
3.8 **Model Results**  
3.9 **Information Evaluation**

### 4 ASSESSMENT OF POTENTIAL VISITOR PRESSURE

4.1 **Introduction**  
4.2 **Visitor Distribution, Existing Information**  
4.3 **Visitor Distribution, Predicted Changes**  
4.4 **Assessment of Predicted Visitor Distribution**  
4.5 **Overview of Predicted Visitor Distribution Along the Trail**
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>GENERAL OVERVIEW</td>
<td>6.4</td>
</tr>
<tr>
<td>89</td>
<td>MANAGEMENT PLANS TO SAFEGUARD THE MONUMENT</td>
<td>6.3</td>
</tr>
<tr>
<td>62</td>
<td>KEY ARCHAEOLOGICAL CONSIDERATIONS</td>
<td>6.2</td>
</tr>
<tr>
<td>61</td>
<td>INTRODUCTION</td>
<td>6.1</td>
</tr>
<tr>
<td>99</td>
<td>MANAGEMENT PRESCRIPTIONS</td>
<td>6</td>
</tr>
<tr>
<td>59</td>
<td>POTENTIAL IMPACTS OF THE NATIONAL TRAIL ON THE MONUMENT</td>
<td>5.4</td>
</tr>
<tr>
<td>56</td>
<td>REVIEW OF IMPACTS OF VISITORS ON OTHER NATIONAL TRAILS</td>
<td>5.3</td>
</tr>
<tr>
<td>54</td>
<td>VISITOR PRESSURE RESEARCH AT OTHER ARCHAEOLOGICAL SITES</td>
<td>5.2</td>
</tr>
<tr>
<td>54</td>
<td>INTRODUCTION</td>
<td>5.1</td>
</tr>
<tr>
<td>54</td>
<td>ASSESSMENT OF POTENTIAL IMPACTS OF THE NATIONAL TRAIL ON</td>
<td>5</td>
</tr>
<tr>
<td>54</td>
<td>HABITATION'S WALL</td>
<td>5</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

1

INTRODUCTION

This is a summary of the study undertaken by ERL (North) for the Countryside Commission and English Heritage which assesses the impact on archaeology of the proposed Hadrian’s Wall National Trail.

The proposed National Trail will be approximately 80 miles long running from WallSEND in the east to Bowness-on-Solway in the west following Hadrian’s Wall for much of its length.

Hadrian’s Wall is a World Heritage Site and a Scheduled Ancient Monument and is one of Britain’s finest archaeological features being a complex frontier zone with many components including the Ditch (1), the Wall, the Military Way and the Vallum. Of overwhelming importance in the development of the trail has been the need to safeguard the unique archaeology of the Wall.

2

OBJECTIVES OF THE STUDY

The study has had four main objectives:

• To develop a model which may be used to classify the archaeological features of the monument in relation to sensitivity to visitor damage (Section 3 of the report);

• An assessment of potential visitor distribution along the trail (Section 4 of the report);

• An assessment of the potential impacts of the National Trail on Hadrian’s Wall (Section 5 of the report);

• A review and assessment of management prescriptions for the trail (Section 6 of the report).

The following sections of this summary provide an outline of how each of these tasks were achieved.

(1) A glossary defining archaeological terms is found on page 52 of this report
in the model and include the following.

certain control factors will dramatically affect the importance of both the

The line of the proposed path is introduced into the model.

Stage 2: Assessment of Control Factors and Assessment of Sensitivity Index

Any archaeologically relevant feature

2.1 In the form of archaeology, this index denotes the importance of
archaeological sites. Index and the longform index with a weighting of
a physical vulnerability index is calculated from an addition of the

- slope across path
- slope along length of path
- surface erosion
- width of path
- change
- soil type
- path surface

Stage 3: Assessment of Physical Vulnerability Index

Information from the baseline condition survey.

A vulnerability index is calculated from the following range of

form in which a feature survives.

An archaeological feature index is assessed from information about the

Stage 2: Assessment of Physical Vulnerability Index

The basic steps of the model are as follows:

OUTLINE OF THE MODEL PROCESS

that feature under a range of visitor pressure.

decreases in general terms the necessary management procedure to safeguard
vulnerability of the feature to increased visitor pressure and as its end point
assess the impact on sensitivity of the particular feature, then assess the
archaeological features identified as part of the monument. The model first

The model has a series of steps which may be followed for any of the 114

England (RCAHM).

In summary, information from the Royal Commission on the Historical Monuments of
Community Commission’s baseline condition survey and archaeological

to assess the information collected in the

SENSITIVITY TO VISITOR DAMAGE

CLASSIFICATION OF ARCHAEOLOGICAL FEATURES IN RELATION TO
- position of the trail in relation to the monument;
- pinch-point;
- control barriers - hedge, wall, fence, road etc;
- point of interest off trail;
- walking behaviour.

- A sensitivity index is calculated for each feature using the physical vulnerability index defined in Stage 1 and the control factors outlined above. This index is an assessment of the inherent stability of any feature in terms of the line of the National Trail.

**Stage 3: Assessment of the Effects of Visitors and Prediction of Management Routine**

- Predicted visitor numbers for the National Trail are introduced into the model.

- A general management prescription for any feature is outlined by relating the sensitivity index to the predicted visitor numbers in the vicinity of that feature.

These include:

- routine monitoring;
- routine monitoring, consider management prescription;
- management prescription including routine monitoring.

The detailed results from the modelling process are contained in Annex C. In summary 314 archaeological features were identified with high sensitivity indices (17% of the total); 220 with medium sensitivity indices (12%) and 1280 with low sensitivity indices (71%).

Those features with high sensitivity indices are distributed along the length of the trail from Heddon on the Wall as far as Carlisle in the west.
The level of maintenance and promotion of the trail will affect the numbers of visitors to the trail. The trail is currently at risk of being lost due to lack of maintenance and promotion. The development of new trails can help relieve pressure on areas of the trail where they do not exist.

The trail is currently at risk of being lost due to lack of maintenance and promotion. The development of new trails can help relieve pressure on areas of the trail where they do not exist.

Lack of car parking will limit numbers gaining access to the busiest parts of the trail.

Access to the trail from the road and 400 additional walks are predicted assuming no new trails are developed. An estimated 20,000 people will walk the full length of the trail. There will be sections in areas where there is currently no public right of way. Existing facilities already experience significant visitor activity and will become busier.

Of 2,600 visits at any one time between Heddon-on-the-Wall and Lanercost there is parking for in excess of 400 visitors and also along the length of the trail. The trail will be well served by public transport both for access at the end of the trail and for car parking.

Following conclusions:

A review of existing information of known visitor distribution patterns for the trail was an essential part of the use of other National Trails combined with an assessment of current facilities along the Wall has led to the development of new trails being proposed as a result of the National Trails Project.
The potential impacts on the monument that might arise as a result of the proposed trail are assessed. In order to define these potential impacts a review of both the impact of visitors at other archaeological sites as well as the impacts of visitors on other National Trails has been undertaken. The main conclusions are:

- the creation of new public rights of way will inevitably lead to some impacts in areas which have not previously been visited;

- there may be increased erosion in areas currently experiencing heavy visitor pressure if no preemptive management is undertaken;

- generally the surface of the proposed trail is good with only 0.23 miles recorded with extensive erosion at present even though there has been little active management of existing footpaths to date;

- the intensity of trampling impacts will be directly correlated with the number of visitors;

- current facilities will limit the numbers of new day walkers on the busiest sections of the trail. Visitor distribution is anticipated to be light (up to 50,000) away from the central section. In addition, visitors will be spread over a large area (80 miles in length);

- sensitive archaeological features will be at risk from increased visitor pressure if preemptive management is not undertaken. Pinch-points and where the route crosses or follows on top of the monument will be most at risk;

- resource availability and management strategies will improve the present footpaths and increase stability near archaeological features;

- the trail will allow the possibility for carefully managed access for the public to larger stretches of an important monument.
under taken to safeguard the management before the trail opens.

The trial provides an unique opportunity for preemptive management to be

calcut an the effects of monitored numbers of vists on the park.

The trial will provide an ideal opportunity for detailed research to be

archaeological features in proximity to the alternative route.

model is used in order to redefine the sensitivity indices for any

wherever a section of the trail may be re-shaped if it is essential that the

inspiration and management prescriptions are reached when necessary.

it is essential that the length of the trail is routinely monitored after its

most vulnerable features, route alignment should be reconsidered.

features which have been identified with high sensitivity indices. For the

management prescriptions should be drawn up for all those archaeologically

landscape. This will vary along different lengths of the trail.

surrounding should be chosen which is in harmony with the surrounding

a large variety of seed mixes are available and a suitable mix for any

follows:

last resort will generally a policy of minimal intervention should be

a wide variety of management techniques exist which may be used as a

particular decision to sensitive archaeological features.

this generally a policy of active grass management should be followed;

there has been little recorded research on management of meadow soils

conclusions have been drawn.

and also in safeguarding sensitive archaeological features. The following

the most appropriate path surface for the trail both in terms of the landscape

The establishment of a sustainable greenward path has been identified as
CONCLUSIONS

- A flexible, sensitive model has been developed which assesses the vulnerability of any defined archaeological feature along the trail to visitor pressure. The end point of the model is a general management prescription for that feature.

- Worst case predicted visitor numbers have been calculated for the length of the trail but in the absence of much detailed previous visitor information these figures are likely to be over estimates.

- Many day walkers are likely to be those from the local area already visiting the Wall.

- Up to 20,000 visitors may walk the length of the trail annually.

- Visitor numbers are likely to be greatest between Chesters in the east and Lanercost in the west because of the present distribution of car parks.

- The Wall is a complex linear monument and those features most at risk may be those which are most difficult to identify.

- A feature will be less vulnerable (apart from at access points) where a reasonable turf cover may be maintained.

- A wide range of management techniques exist which may be used to mitigate those impacts outlined in the study.

- Routine monitoring of the trail is the most important management prescription.

- It is likely that with sensitive management a successful greensward path could be maintained along much of the length of the Wall that is in harmony with the fabric and setting of the monument.
INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report is an assessment of the impacts on the archaeology of Hadrian’s Wall that might arise as a result of the establishment of the proposed National Trail and also includes a review of potential management prescriptions which may in part mitigate these impacts.

The report has been produced at the request of the Countryside Commission and English Heritage.

1.2 HADRIAN’S WALL

Hadrian’s Wall is undoubtedly one of Britain’s finest archaeological and historic features and this is given formal expression both nationally through the measures of protection affected by it’s status as a Scheduled Ancient Monument under the terms of the Ancient Monuments and Archaeological Areas Act 1979 and the National Heritage Act 1983 and internationally through its designation by UNESCO (1) in 1987 under the World Heritage Convention as a World Heritage Site because of its potential to yield information "illustrative of a significant historical period." As a World Heritage Site it is one of only 14 sites in Britain and the designation is in recognition of the Wall’s outstanding Roman archaeology in content, preserved form and landscape setting.

The Wall runs for approximately 73 miles from the mouth of the Tyne at Wallsend through north Tyneside and Newcastle, up and down the spectacular craggy scenery of south west Northumberland through the rolling rural landscape of Cumbria to Bowness-on-Solway on the Solway Firth.

The Wall is a complex frontier zone consisting of four linear elements, the Ditch (2), the Wall, the Military Way and the Vallum (from north to south) and at intervals along the route individual features built into the Wall, the turrets and milecastles, and on a larger scale the forts, free-standing features such as the mithraeum at Carrawburgh or the group of buildings in the vicus at Housesteads and the features such as field banks which may be unconnected with the Roman monument, but form part of its landscape context.

(1) United Nation’s Educational Scientific and Cultural Organisation

(2) A glossary defining archaeological terms is found on page 92 of this report
The proposed trail will overlap with the well established Pendle Pennine Way for

HADRIAN’S WALL NATIONAL TRAIL

 kam within the Northumberland National Park

The proposed trail will overlap with the well established Pendle Pennine Way for

and some

The proposed National Trail will be approximately 80 miles long running

from Warkhill in the east to Brampton in the west. It will not only

provide for the future development

was published in 1996 setting out a draft proposal for the route and some

developed as a National Trail. An informal public consultation document

acknowledged as a priority by the Countryside Commission in June

By 1995 the concept of a Hadrian’s Wall Route had grown sufficiently to be

(1992)

HADRIAN’S WALL NATIONAL TRAIL

extended (1998) this following section of the official form a description

and first published in 1969 and still in print in its initial edition revised and

entitled in the Department Report (1976) and the idea was expanded by the

The need for a continuous, safe path along Hadrian’s Wall was first

Petitioned in December of 1976 and an Act of Parliament was passed in 1983

including the creation of a Public Right of Way is

The section where walkers at present must walk on the roads beside

Haddo’s Wall is

The Countryside Commission in May 1996[f] stated that the

Haddo’s Wall extends the walk to the east of the Roman Wall.

The idea of the Pilgrimage Route is to make a record in watercolour of the

The idea of a walk along Hadrian’s Wall arises out of the initiative

was conceived during the course of this study.

HADRIAN’S WALL NATIONAL TRAIL

National Trust the Victorian Trust and the County Councils of whom

most significant sites are in the custodianship of English Heritage. The

Wall passes is owned by private landowners as well as public bodies and the

status is doubled by private ownership as well as public bodies and the

maintenance of the fabric of the monument. The Landowners which the

English Heritage is the statutory body responsible for the protection and
Of overwhelming importance in the development of the trail has been the need to safeguard the unique archaeology of the Wall and hence the stimulus for this study.

English Heritage in their 1991 policy statement on historic landscapes recognises that "all landscapes of historic interest are part of a living and evolving countryside, and effective policies for historic conservation must form part of wider strategies designated to achieve both conservation and agricultural support" such "policies must recognise the inevitability of change and the need for the thoughtful direction and management of necessary changes in order to avoid sterile fossilisation."

1.4

**SCOPE OF THE REPORT**

This study has been for the most part a desk-based study assessing information from previous research. A major part of the study has been to develop a model which will identify and assess features of the monument’s archaeology which are vulnerable to damage from visitor pressure and this model and its evolution are described in detail in Section 3 of the report.

A second major objective had been to review current visitor distribution and trends and to predict the potential visitor distribution as a result of the National Trail.

These two models have been linked in order that an assessment might be made of the potential impacts of the predicted visitor distribution on features of the monument. Suitable management prescriptions for vulnerable features are discussed including suggestions for the optimum alignment of the proposed route where such features may be most at risk.

The detailed results from the modelling process are contained within Annex C.

This report considers the monument westwards from Heddon on the Wall, from where the proposed route follows the line of the Wall more closely and thus excludes the urban area of Tyneside.

1.5

**LAYOUT OF THE REPORT**

The remainder of the report is structured as follows:

- **Section 2:** Sources of Information
- **Section 3:** Classification of Archaeological Features in Relation to Sensitivity to Visitor Damage
- **Section 4:** Assessment of Potential Visitor Pressure
- **Section 5:** Assessment of Potential Impacts of the National Trail on Hadrian’s Wall
2 SOURCES OF INFORMATION

2.1 INTRODUCTION

The Brief (see Annex A) for the project included fairly comprehensive sources of information which were used as the basis for this study. A short review of these and of additional sources consulted are outlined below.

2.2 ARCHAEOLOGICAL SOURCES

The archaeological review has taken as its starting point the proposed line of the National Trail plotted on to a 1:2500 scale map base. On to this has been overlaid the 1:2500 scale survey of the archaeological features, Wall and associated earthworks, prepared by the Royal Commission on the Historical Monuments of England (RCHME). This formal depiction of the visible features is supported by descriptive field notes which comment on such matters as the condition of the feature and the surrounding land use. While it must be noted that the RCHME Survey does not delineate the features that cannot be shown at the 1:2500 scale, this is the most detailed survey ever done of the monument along its complete length. In the central sector, the visitor impact upon the consolidated fabric of the Wall has been recorded in a photographic Baseline Condition Survey conducted by English Heritage.

For the analysis, the monument has been divided into 1814 segments corresponding to the divisions of land within the Countryside Commission’s Baseline Condition Survey and within these to the divisions of the monument in the RCHME survey. Thus, individual features such as milecastles and forts have individual entries in the database and on the linear features significant changes of form or condition trigger a new record.

2.3 LANDFORM SOURCES

The basis for the landform assessment was the 1991 Countryside Commission Baseline Condition Survey of the whole length of the proposed National Trail. A detailed photographic record formed part of this survey and has been particularly useful in a largely desk-based survey.

2.4 VISITOR NUMBERS

Existing information about visitor distribution on the Wall is limited and is restricted to those most popular sections of the Wall. No comprehensive detailed visitor distribution surveys have been conducted as yet for any of the proposed National Trail. Visitor information for selected sites along the length of the Wall is available and a recent survey conducted of the Pennine Way (Ash 1990) includes details of visitor activity along a part of the proposed Hadrian’s Wall Trail. Sections of the trail are not yet open to the
and manufacturers of products for logpath management.

Communications and telephony calls and information from seed companies.

archaeological sites particularly Stonehenge (LUC 1988), personal

Cleveland Way and the Three Peaks Project) review of work from other

management strategies for other long-distance paths (Pennine Way,

various research papers on erosion and management (see Section 6), the

Management Proposal information for this section came from review of

MANAGEMENT PROPOSALS

activity associated with the use of public rights of way, where they exist

public and for these areas it is assumed that there is only limited visitor
CLASSIFICATION OF ARCHAEOLOGICAL FEATURES IN RELATION TO SENSITIVITY TO VISITOR DAMAGE

3.1 INTRODUCTION

A major objective of this study was to "identify and assess features of the monument's archaeology, that are vulnerable to damage from visitor pressure and rank in order of sensitivity."

In order to achieve this aim a model has been developed which may be used to assess the sensitivity to visitor pressure of each of the 1814 items identified in the Archaeological Baseline Condition Survey.

The model has been developed after much discussion bringing together both archaeological and ecological thoughts and principles. Mathematical advice was sought from a mathematical specialist and this was incorporated into the model.

Within the terms of the brief it was felt that the archaeological perspective was at all times the most important consideration and this is reflected in the structure of the model.

3.2 THE MODEL

3.2.1 Introduction

The model is best described as a series of steps which may be followed for any of the archaeological features identified as part of the monument and which as its end point describes in general terms the necessary management procedure to safeguard that feature under a range of visitor pressure.

In the terms of the Brief the model was seen primarily as a tool to assess the vulnerability of any archaeological feature to increased visitor pressure. The background philosophy to its development has been always to identify the "worst-case scenario".

The model may be interrogated at any stage and provide information for any feature at different steps or stages. Similarly the database may be easily changed at any stage of the model. Thus the system provides maximum flexibility of use both at the present time and also in the future when any of the variables may change and require updating.

3.2.2 Outline of Stages of the Model

The basic steps or stages of the model are summarised in Figure 3.2.2a and Table 3.2.2a and are described briefly below. In Sections 3.3 - 3.6 the model process is described in detail.
Relational to Sensitivity to Visitor Pressuse

Figure 3.2.1a: Schematic Representation of Model Used
Stage 1: Assessment of Physical Vulnerability Index

1. Calculation of archaeological stability index.

2. Calculation of landform index.

3. Calculation of physical vulnerability index from 1 and 2 with a weighting of 2:1 in favour of archaeology.

Stage 2: Assessment of Control Factors Affecting the Model and Definition of Sensitivity Index

1. Assessment of control factors:
   a) control boundary;
   b) distance of archaeological feature from trail (on/crossing; <10m; >10m)
   c) pinch-point

2. Calculation of sensitivity index using the physical vulnerability index and the control factors.

Stage 3: Assessment of the Effects of Visitors and Prediction of Management Routine

1. Assessment of the predicted visitor numbers on sensitivity index gives management prescription for any archaeological feature.
Stage 1:

Assessment of Physical Vulnerability Index

It was felt that the inherent stability of any archaeological feature on the proposed trail might be defined from the available baseline information as a score which took account of both its own archaeological form and also the landform of the trail in the vicinity of the feature. The archaeological stability index is assessed from information about the form in which a feature survives (see Section 3.3.1) and the landform stability index is assessed from information collected in the Baseline Condition Survey (see Section 3.3.2). These two indices are combined to establish a physical vulnerability index (see Section 3.3.3). Where the trail is for example >20 m from the archaeological feature the landform data is perhaps of less relevance but this was the only information which could be used in a largely desk-based study and it was felt that it would give an idea of the potential vulnerability to visitor pressure of the land surrounding the feature.

In both the scoring of the landform index and the archaeological index inherent stability was defined as the existing situation as seen in relation to increased visitor pressure.

Stage 2:

Assessment of Control Factors Affecting the Model and Definition of a Sensitivity Index

In discussion it was felt that certain control factors could dramatically affect the importance of both the inherent stability of the monument and reduce or exaggerate the effects of current and predicted visitor pressure. These control factors include the following:

• position of the trail in relation to the monument;

• pinch-points;

• control barriers - hedge, wall, road, fence etc;

• points of interest off trail;

• walking behaviour.

Their effects on the model are described in Section 3.4.

The end point of this step in the model is the definition of a sensitivity index for each feature which is calculated using the physical vulnerability index and the control factors (see Section 3.5).
Stage 3:

Assessment of the Effects of Visitors and Prediction of Management Routine

When predicted visitor numbers for the National Trail are introduced into the model the inherent stability of any feature in relation to the trail can be predicted. There are other factors affecting the inherent stability of any feature such as the climate and current landuse practices but these factors are felt to be generally outside the scope of the Brief.

The model asks what is the effect of predicted visitor numbers on the monument. Predicted visitor numbers are based on walkers using the new National Trail and also current trends in visitor activity at known sites along the Wall (see Section 3.6).

The suggested management prescription for any feature will be related to the sensitivity index defined by the model and the predicted numbers of visitors that may pass that feature (see Figure 3.6b).

3.2.3 The Model in Detail

Each major step in the model is described in greater detail in the following sections. The complete model is shown in Figures 3.3a and 3.6b.

3.3 Stage 1: Assessment of Physical Vulnerability Index

As described in Section 3.2 the inherent physical stability of any part of the monument is related to both its archaeological form and also to the landform of the surrounding terrain.

The detailed methodology used for the assessment of the archaeological stability is described in Section 3.3.1 and of the inherent landform stability in Section 3.3.2. For the purposes of the assessment of physical vulnerability the two indices are integrated and this is described in Section 3.3.3.

3.3.1 Assessment of Inherent Archaeological Stability Index

In the assessment of archaeological sensitivity no attempt has been made to grade the importance of one part of the monument as compared with another. The assumption has been made a priori that the monument is important as a whole and in its constituent divisions. The judgements which have been made concern only the question of sensitivity to damage.
The physical form in which the monument survives is taken as the basis for assessing sensitivity. This is classified under three headings:

- the Principal Categories are given as "stone", "earthwork" and "sub-surface features"; "presumed line" and "quarry";

- the Main Physical Form classes allow a distinction between consolidated and unconsolidated stone features and the soil or vegetation cover of earthworks and sub-surface features;

- the Physical Form Sub-Classes allow for finer distinctions to be drawn, distinguishing different Wall consolidation types, the sort of cover represented on the unconsolidated Wall and the presence of erosion in earthworks. It also allows the classification "vestigial traces" for very slight remains and "negative feature" for a robber trench. The full list is given in Table 3.3.1a.

Table 3.3.1a Classification of Archaeological Form

<table>
<thead>
<tr>
<th>Principal Categories</th>
<th>S  Stone Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E  Earthwork</td>
</tr>
<tr>
<td></td>
<td>B  Subsurface Feature</td>
</tr>
<tr>
<td></td>
<td>P  Presumed Line</td>
</tr>
<tr>
<td></td>
<td>Q  Quarry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main Physical Form</th>
<th>A  Consolidated Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B  Unconsolidated Wall</td>
</tr>
<tr>
<td></td>
<td>C  Turf Covered</td>
</tr>
<tr>
<td></td>
<td>D  Under Plough</td>
</tr>
<tr>
<td></td>
<td>E  Woodland / Scrub</td>
</tr>
<tr>
<td></td>
<td>F  Below Hard Surface</td>
</tr>
<tr>
<td></td>
<td>G  Below Medium Surface</td>
</tr>
<tr>
<td></td>
<td>H  Bare Rock</td>
</tr>
<tr>
<td></td>
<td>J  Built Up Area</td>
</tr>
<tr>
<td></td>
<td>X  Destroyed</td>
</tr>
</tbody>
</table>
what remains of it may be exposed, with the prolonged formation a protective
windscreen. Whereas the protective substances found in nature, or
are sometimes disposed of in a manner to prevent its being
uncovered by the natural elements, through the gradual
deterioration of the rock, it is safe to examine the surface of
the earthwork as it originally appeared. In general, all surface
features may be less visible on the surface to a sub-surface feature as the land
changes from

The discussion of the surface features applies to cultures such as the
Dinka and Yalman

people are more likely to want to climb on the Canyon Wall.

more work, whereas Canyon found in a typical cliff. In a convenient
“preservation as found”. The Wall core may be exposed as an uneven surface in
interpreted. A second difference is that under the principle
Canyon used as a marker and so the consolidation west of Housesteads is
and the core are pushed in new mortar lining consolidation, whereas
which is relevant to this study is that in modern work the easiest
Canyon west and southwest of Consolidation, whereas
objects, and more recent work. This is not the place to consider
shows a distinction to be drawn between the work of John Canyon in the
the division of the class stone - Consoliated

uncovered is normally used of the stern, often a fort, the case of a fort

In reality there may be some overlap between stone and earthworks in a

<table>
<thead>
<tr>
<th>Physical Form Sub-Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>
barrier between the surviving archaeological deposits and the footsteps which is not present for an earthwork under an upland sward.

The Presumed Line is, from the point of physical form, identical to the "subsurface feature". Neither is visible. The latter is used where there is reasonably good evidence from interpolation, geophysical scanning, or excavation evidence for the exact position of the feature. "Presumed Line" indicates a degree of uncertainty about position or alignment. Management prescriptions have to be made on the assumption that the presumed line is correct, even though this may not be the case on every occasion.

A scoring system has been applied to the archaeological form categories on a scale of 1 - 9 in increasing sensitivity to damage. This treats the archaeological monument in the same way as the landform and the two are then brought together in an index of sensitivity (see section 3.3.3).

**Table 3.3.1b  Scoring of Archaeological Form**

<table>
<thead>
<tr>
<th>Principal Category</th>
<th>Physical Form - Main</th>
<th>Physical Form - Sub</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>A</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>S</td>
<td>A</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>S</td>
<td>A</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>S</td>
<td>B</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>S</td>
<td>B</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>S</td>
<td>B</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>S</td>
<td>C</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>C</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>D</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>E</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>B/P</td>
<td>C</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>B/P</td>
<td>D</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>B/P</td>
<td>E</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>B/P</td>
<td>F</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B/P</td>
<td>G</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>B/P</td>
<td>J</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>C</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>H</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>X</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Any entry</td>
<td>Any entry</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Any entry</td>
<td>Any entry</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

For key see Table 3.3.1a.
It has been noted that the RCHME survey of the monument, used as the basis for this study, was not undertaken with a scoring system in mind. The requirement set by the Countryside Commission and English Heritage of a model based on a scoring system may therefore be open to criticism. However, in this study we have attempted to avoid making subjective use of the RCHME data by structuring the analysis on the objective characteristics of physical form. The application of a score to each of these characteristics is clearly a matter of judgement, going beyond the justifications for the data as recorded. However, this is a legitimate extension, based on a professional assessment. In the full data-set for this study, we have recorded the physical form characteristics of each site, giving it a further element to the scoring system being adopted.

The term "vestigial remains" which we have allowed for stone and earthwork features does break the rule of objective physical form characteristics. We have introduced it with the idea of objective potential and stewardship in mind. It allows us to highlight the cases where the archaeological resource is very fragile and where only slight damage may cause complete loss. The figures in the database have been made on reading the evidence collected by the RCHME survey, comments in the record such as "barely visible" or "hardly surveyable" have been used in these cases where the evidence is very tenuous.

A heading of rarity has been included in the database. This has been used in about 2% of the records to cover such cases as the Turf Wall, places Poltross Burn Milecastle where the evidence is scarce and where the quality of the recording is very poor.

This assessment was made exclusively from information collected by the Countryside Commission in the Baseline Condition Survey.

Seven categories from the survey were chosen as those most relevant in the assessment of the inherent vulnerability of the land to increased visit. The categories used were:

- path surface
- soil type
- drainage
- present surface erosion
- pressure
- length of path
- slope across path

3.3.2 Assessment of Inherent Landform Stability Index

The categories used were:
A number of people with either ecological or recreational expertise were asked to score the features within each category in terms of sensitivity to increased visitor usage using the following 1 - 9 scale where 1 would indicate only slight sensitivity to increased visitor usage and 9 would indicate extreme sensitivity.

**Sensitivity to Increased Visitor Usage**

1  Slight  
2  |  
3  |  
4  |  
5  Moderate  
6  |  
7  |  
8  |  
9  Extreme  

Any number of components within any category could score the same figure.

An average score for each component was then calculated from the 8 contributions received and these are represented in Table 3.3.2a below.

**Table 3.3.2a  Landform Stability Assessment - Categories and Scoring**

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path Surface</td>
<td></td>
</tr>
<tr>
<td>- Road (tarmac / aggregate composition)</td>
<td>1.13</td>
</tr>
<tr>
<td>- Concrete</td>
<td>1.13</td>
</tr>
<tr>
<td>- Pavement</td>
<td>1.5</td>
</tr>
<tr>
<td>- Tarmac</td>
<td>1.38</td>
</tr>
<tr>
<td>- Stone pitched</td>
<td>2.38</td>
</tr>
<tr>
<td>- Stone step (urban)</td>
<td>1.75</td>
</tr>
<tr>
<td>- Aggregate path</td>
<td>3.75</td>
</tr>
<tr>
<td>- Aggregate track</td>
<td>4.13</td>
</tr>
<tr>
<td>- Stone steps (rural)</td>
<td>3.38</td>
</tr>
<tr>
<td>- Wooden edged steps (rural)</td>
<td>5.13</td>
</tr>
<tr>
<td>- Grassed track</td>
<td>5.38</td>
</tr>
<tr>
<td>- Formal track (ie planted with amenity species)</td>
<td>4.38</td>
</tr>
<tr>
<td>- Formal grass (ie planted with amenity species)</td>
<td>5.13</td>
</tr>
<tr>
<td>- Roadside verge</td>
<td>5.25</td>
</tr>
<tr>
<td>- Steep rock</td>
<td>2.5</td>
</tr>
<tr>
<td>Score</td>
<td>Category</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>213</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Design**

*Shorea, Glandulara, or Path*

- Average bare width < 5 m
- Average bare width 2 - 5 m
- Average bare width > 2 m
- No bare width

**Surface Exposure / Average Bare Width**

<table>
<thead>
<tr>
<th>Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>Impacted -</td>
</tr>
<tr>
<td>388</td>
<td>Free -</td>
</tr>
<tr>
<td>25</td>
<td>Drained ie with man-made irrigation -</td>
</tr>
</tbody>
</table>

**Substrate**

- Organic -
- Mineral / Rock -
- Mineral -
- Rock -
- Man-made surface -
- Soil Type -

**Substrate**

- Salinity -
- Amble -
- Woodland -
- Scrub -
- Rough Gravel -
- Impervious Gravel -
<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 10</td>
<td>3</td>
</tr>
<tr>
<td>11 - 15</td>
<td>4.75</td>
</tr>
<tr>
<td>16 - 20</td>
<td>5.88</td>
</tr>
<tr>
<td>21 - 25</td>
<td>7</td>
</tr>
<tr>
<td>26 - 30</td>
<td>7.15</td>
</tr>
<tr>
<td>31 - 35</td>
<td>8.38</td>
</tr>
<tr>
<td>&gt;35</td>
<td>9</td>
</tr>
</tbody>
</table>

**Slope Across Path**

<table>
<thead>
<tr>
<th>Degrees</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.38</td>
</tr>
<tr>
<td>1 - 5</td>
<td>1.88</td>
</tr>
<tr>
<td>6 - 10</td>
<td>3.13</td>
</tr>
<tr>
<td>11 - 15</td>
<td>4.5</td>
</tr>
<tr>
<td>16 - 20</td>
<td>5.25</td>
</tr>
<tr>
<td>21 - 25</td>
<td>6.38</td>
</tr>
<tr>
<td>26 - 30</td>
<td>7.5</td>
</tr>
<tr>
<td>31 - 35</td>
<td>8.25</td>
</tr>
<tr>
<td>&gt;35</td>
<td>8.88</td>
</tr>
</tbody>
</table>

*Public Right of Way*

Discussion highlighted that each major category was not of equal importance to the model and hence a weighting was assigned to each category. Again the same specialists were asked to contribute in order to achieve an average score. They were asked to assign a weighting to each of the categories on a 1 - 3 scale or points within this, where 1 was of least significance to the model and 3 was of most significance and an average of those replies received was calculated. The averages were expressed as a fraction of 1 in order to satisfy the mathematical theory of the model. The results are given in Table 3.3.2b below:
The model has to date examined the inherent stability of each of the defined landslides. Because the aim of the study is to examine the potential effects of the combination of these two indices - the archaeological features and the physical vulnerability for any archaeological feature is defined as a 'landform index'.

The increased desktop usage of the path
because the index is a function of the model only serves to highlight the poor condition of this category did contribute to the overall score on the model's index. The model only serves to highlight the poor condition that is present. The results of the double weighting of a particular feature to erosion as a result of the increased usage is as follows. The model was weighted to indicate as much information from the desktop surveys as possible in the index which is assessing the state of the archaeological features. The results of the surveys are used in conjunction with the model to produce an index that is used to indicate as much information as possible in the index which is assessing the state of the archaeological features.

<table>
<thead>
<tr>
<th>Category</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of path</td>
<td>0.50</td>
</tr>
<tr>
<td>Drainage</td>
<td>0.10</td>
</tr>
<tr>
<td>Soil type</td>
<td>0.10</td>
</tr>
<tr>
<td>Pail surface</td>
<td>0.10</td>
</tr>
</tbody>
</table>

The final inherent landslide stability index for any stretch of the path is an accumulation score of the weighted components from each category. The overall score for any component within the model was thus a multiple of the individual score and the weighting factor calculated for that category.
that a weighting should be introduced into the model at this stage. A
weighting factor of 0.67 for archaeological form and 0.33 for landform was
agreed in discussion (ie 2 : 1 in favour of the archaeology which seemed
appropriate as related to the objectives of the brief).

The physical vulnerability for any archaeological feature index may be
summarised by the following equation:-

\[
\text{Landform index} \times 0.33 + \text{Archaeological form index} \times 0.67 = \text{Physical}
\]

\[
\text{vulnerability index}
\]

The physical vulnerability indices ranged from 1.5509 to 6.9221, giving an
overall range of 5.3712 for the index.

After examination of the range of physical vulnerability indices generated
and comparison with known sections of the Wall the following scale was
agreed upon which is taken into account in the model.

Physical Vulnerability Index Scale

Low \(< 3.499\)

Medium \(3.500 - 3.999\)

High \(> 4.0\)

3.4 \textit{STAGE 2A: ASSESSMENT OF CONTROL FACTORS}

With the main physical landscape and archaeological factors established, the
line of the trail is now introduced into the model. To forecast more
accurately the actual risk of damage which is represented by the National
Trail a concept of control factors emerged from discussions which were felt
to be of paramount importance to the model. These include:

- **Control barrier:** if there is a sufficiently robust barrier between an
archaeological feature and the trail, the feature (however physically
vulnerable it may be) will be at considerably reduced risk of damage
from visitors. Such barriers include hedges, fences, walls and roads.

West of Heddon, for example, where the trail is aligned along the
military road, the Ditch and the Vallum are in the fields north and
south respectively and thus there is a greatly reduced risk of walkers
standing on the earthworks.

- **Position of the trail in relation to the monument.** This information is
available from the Baseline Condition Survey.

From the Baseline Survey it is possible to assess whether the trail:

- is actually on the monument (for example the trail in parts is
routed along one of the linear features such as on the Military
Feature

The trail itself has the physical vulnerability of any particular archaeological feature, but it is also a feature of the landscape which would thus assess the effects of weathering. The system proved unsuccessful and obscured the clarity of the model. We attempted to introduce these factors into the model using a coating of PTFE.

Route

Temperatures for walkers to climb on the wall rather than stay on the way. In places where the wall and these would probably be strong. Way off the wall. If there would not be as much chance for a natural path where the wall follows the valley. Would be easy of evening. Shieling. Where the wall follows the valleys. Another example deployed field monitoring after the trail is in experience. Another example provided. This is virtually impossible to assess with any detail.

Walking behaviour: Certain features may be more at risk if for example

Identifiable

To identify in a desk-based study, such points of interest are not readily

more identifiable. The model allows for this possibility.

search of a view and thus such as a feature will be more at risk than a

skyline may be an incentive to destroy and climb onto the feature in

find such a prominent earthwork feature situated against the

Point of interest off the trail. Any prominent feature which is off the

of the structure is already evident.

Where there is erosion at the gateway and around the outer wall

point will put the feature at increased risk of damage. An example is

explained the reason. The increased risk illustrated at these particular

An example would be the micaeous gateway, which though off the

space on the trail.

Archeological feature. Walkers may tend to walk through a cut made

by a particular type, or because of the name of the

Pitfall: These may be more difficult of certain force

The visitor

Proximity to the trail especially if it is a particular type of feature to

The vulnerability of a feature may be much greater if it is in close

20 m from an archeological feature

10 m from an archeological feature

10 m from an archeological feature

Cross the monument - either on earthwork or stone feature

Chalices

Way west of some buildings far from the trail by Halton

Elam (North)
3.5  **STAGE 2B: ASSESSMENT OF SENSITIVITY INDEX**

The endpoint of interrogating the model for any archaeological feature at this stage will be a sensitivity index.

The sensitivity index is a general high, medium or low index which indicates the immediate necessity for management or potential necessity for preemptive management to avoid damage to particularly vulnerable features of the monument.

Table 3.5a summarises the assessment of the sensitivity index.

The model is not interrogated to its endpoint for features with low physical vulnerability indices (<3.499) which are not affected by one of the control factors since their stability to visitor pressure is inherently relatively high and thus a policy of routine monitoring is sufficient at this stage.

Any feature which is inherently vulnerable to visitors either in its own form or in the surrounding landform will have already scored a high physical vulnerability index and thus will remain in the model. Any feature which has a low vulnerability index but which is in direct contact with the trail (or/crossing) (unless under hard-surface) or has a pinch-point will also remain in the model. For any feature with a medium or high physical vulnerability index or a low physical vulnerability index with a relevant control factor the sensitivity index will be calculated from an assessment of the effect of control factors in combination with the inherent stability of the feature (the physical vulnerability index) as outlined in Table 3.5a.

At this stage the Baseline Condition data does not allow an assessment of the state of a control boundary, the visibility of a feature or any potential desire lines but these could be added into the model in the future and so have been included in Table 3.5a.

3.6  **STAGE 3: ASSESSMENT OF THE EFFECTS OF VISITORS AND PREDICTION OF MANAGEMENT ROUTINE**

In order to assess the potential effects of visitors on the monument as a result of the trail the predicted visitor numbers which may pass any feature as a result of the National Trail must be fed into the model.

The model could also be used at this stage to assess current pressure on the monument if current visitor numbers are fed into the data.

It is the interaction between predicted visitor numbers and the sensitivity index that will determine the management prescription for any section of the trail adjacent to any of the 1814 features of the monument.
### Table 3.5a: Assessment of Sensitivity Index

<table>
<thead>
<tr>
<th>Physical Vulnerability Index</th>
<th>Distance from Monument</th>
<th>Pinch-point / Visibility of Feature</th>
<th>Walking Behaviour</th>
<th>Sensitivity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>&lt; 10</td>
<td>None</td>
<td>Yes</td>
<td>Low</td>
</tr>
<tr>
<td>Medium</td>
<td>10 - 20</td>
<td>None</td>
<td>Yes</td>
<td>High**</td>
</tr>
<tr>
<td>High</td>
<td>&gt; 20</td>
<td>Yes</td>
<td>No</td>
<td>Low</td>
</tr>
</tbody>
</table>

*Note: Information not available for certain rows.*

This second stage of the model is shown in Figure 3.6b. A feature will be at much less risk if the predicted numbers of walkers on that part of the route are low.

In terms of visitor numbers generally in Britain even the busiest sites on the Wall, Housesteads, has only fairly low visitor numbers although there is some feeling that these figures may be an under estimate of those people who actually visit the fort since the figure is purely a reflection of those who have passed through the museum and pay desk.
Stage 2: Management Prescription

Sensitivity Index

- Low

Predicted Visitor Numbers

- Low
- Medium
- High

Management Prescription

- Routine Monitoring

- Routine Monitoring
- Routine Monitoring Considering Management Prescription

- Management Prescription Including Routine Monitoring
a suggested management route.

The following matrix (Table 3.6c) outlines the interaction between predicted

potentials for development of all these factors and also from the calculations

of predicted new users of the National Trail.

Because so little data about visitor distribution is available for much of the

proposed route a broad scale for visitor numbers based on the findings

are other less sensitive sites.

However, because of the exceptional quality and vulnerability of the

Table 3.6a

Comparison of Visitor Numbers at Some Popular Sites in Britain

<table>
<thead>
<tr>
<th>Venue</th>
<th>Visitors (Numbers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunham Curtilage</td>
<td>89325</td>
</tr>
<tr>
<td>Beamish Museum</td>
<td>65324</td>
</tr>
<tr>
<td>Roman Mona</td>
<td>69824</td>
</tr>
<tr>
<td>Stonehenge</td>
<td>74233</td>
</tr>
<tr>
<td>Houses of the</td>
<td>12324</td>
</tr>
</tbody>
</table>
Table 3.6b

Predicted Visitor Numbers to Hadrian’s Wall

<table>
<thead>
<tr>
<th>Visitor Numbers</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt;50,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50,000 - 100,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;100,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.6c

Matrix to Predict Management Routine

<table>
<thead>
<tr>
<th>Visitor Numbers</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt;50,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50,000 - 100,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;100,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensitivity Index</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Management routinely including Routine Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine Monitoring</td>
<td></td>
<td></td>
<td></td>
<td>Routine Monitoring</td>
</tr>
<tr>
<td>Routine Monitoring</td>
<td></td>
<td></td>
<td></td>
<td>Routine Monitoring</td>
</tr>
<tr>
<td>Routine Monitoring</td>
<td></td>
<td></td>
<td></td>
<td>Routine Monitoring</td>
</tr>
<tr>
<td>Routine Monitoring</td>
<td></td>
<td></td>
<td></td>
<td>Routine Monitoring</td>
</tr>
<tr>
<td>Routine Monitoring</td>
<td></td>
<td></td>
<td></td>
<td>Routine Monitoring</td>
</tr>
<tr>
<td>Routine Monitoring</td>
<td></td>
<td></td>
<td></td>
<td>Routine Monitoring</td>
</tr>
<tr>
<td>Routine Monitoring</td>
<td></td>
<td></td>
<td></td>
<td>Routine Monitoring</td>
</tr>
</tbody>
</table>

Management strategies are considered in Section 6 of this report.

3.7 CHECKING OF THE MODEL

The first stages of the model (the assessment of the physical vulnerability index) were used for two sections of the trail - between Milecastles 13 and 14 west of Heddon and between Milecastles 36 and 37 in the central section and the results discussed with those who had detailed knowledge of the Wall. The results were encouraging and the model was apparently sufficiently sensitive to indicate features known to be vulnerable.

It has been noted that some sections of the trail where the landform index was high because of an inherent landform problem such as erosion have in the calculation of the physical vulnerability index become diluted out if there was a relatively stable archaeological feature in the section. This is because the model is weighted to archaeology. If more detailed landform data is required the model could be interrogated at the landform index stage.
MODEL RESULTS

In summary, 314 (17%) archaeological features were identified with high sensitivity indices; 220 (12%) with medium indices and 129 (7%) with low indices.

Those with high sensitivity indices are distributed along the length of the trail from Heddon on the Wall to Carlisle. Features with medium sensitivity indices are concentrated along the central sector with 72% of them occurring on Maps 16 to 17. There are no features of medium sensitivity further west than Carlisle. The low sensitivity indices are distributed throughout the study area, however, over 70% occur either east of Chester Fort or west of Biddulph. Thus, a clear picture emerges of a high proportion of features with medium to high sensitivity occurring in the central sector and its periphery whereas features of low sensitivity are concentrated towards the eastern and western boundaries of the study area.

The form classification of features with a high sensitivity index, cover four of the five Principal Categories (see Section 3.3.1): stone structure, earthwork, subsurface features and presumed line. A detailed analysis of these features with high sensitivity indices indicate that 27 different types of feature are encountered, and these are outlined in Table 3.3a.
<table>
<thead>
<tr>
<th>Stone Structure</th>
<th>Earthwork</th>
<th>Presumed Line</th>
<th>Subsurface Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turf Covered</td>
<td>Turf Covered</td>
<td>Turf Covered</td>
<td>Turf Covered</td>
</tr>
<tr>
<td>Turf Covered, Vestigial Traces</td>
<td>Turf Covered, Vestigial Traces</td>
<td>Under Plough</td>
<td>Under Plough</td>
</tr>
<tr>
<td>Destroyed</td>
<td>Turf Covered, Erosion Patches</td>
<td>Woodland / Scrub</td>
<td>Woodland / Scrub</td>
</tr>
<tr>
<td>Consolidated Wall, Flat-topped</td>
<td>Under Plough</td>
<td>Below Medium Surface</td>
<td>Built Up Area</td>
</tr>
<tr>
<td></td>
<td>Under Plough, Vestigial Traces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consolidated Wall, Consolidated Core</td>
<td>Woodland / Scrub</td>
<td>Built Up Area</td>
<td></td>
</tr>
<tr>
<td>Consolidated Wall, Vegetation Covered</td>
<td>Woodland / Scrub, Vestigial Traces</td>
<td>Destroyed</td>
<td></td>
</tr>
<tr>
<td>Unconsolidated Wall, Exposed Stone</td>
<td>Destroyed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unconsolidated Wall, Turf Covered</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unconsolidated Wall, Vestigial Traces</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In identifying the type of management required, predicted visitor numbers were addressed only in the broadest of terms. Thus, recommendations concerning management procedure found in Table 4 in Annex C must be seen as a general indication of the likely broad pattern of management. It was predicted that 17% of the features required initial management prescriptions (preemptive action) including routine monitoring; 11% were identified as being in need of routine monitoring but with the possibility of requiring a management prescription in the future if signs of wear become apparent, and 72% of features were found to need only routine monitoring to maintain a check for damage occurring to features through time. Details of the suggested preemptive and other management prescriptions are given in Section 6.

The matrix outlined in Figure 3.6c illustrates the effect of various ranges of predicted visitor numbers on features with different sensitivity indices. In general, whenever a high sensitivity index occurs a management prescription is required, irrespective of predicted visitor numbers. If a feature has been calculated to have a medium sensitivity index and predicted visitor numbers
normal means of access is by the track which sits in the bottom of the
although the track follows the contour of course of the wall, the present
picture is that it has already been identified at a Rhyolite Farm for example that

always walk on the designated route;

despite those from the baseline condition survey as walkers do not
it is not easy to identify points of interest, view points or potential

would be possible;

shown at the I: 2000 scale. A more detailed archaeological analysis
the RICHLIEU archaeological survey only depicts features which can be

numbers;

allowed more accurate calibration of the model against known visitor
accurate counts from other sections of the present park would have

information of people using the path from the site likely to park
more information by the survey which would be useful
there is relatively little information available about current usage of

archaeological sensitivity formula:

archaeological sensitivity formula:

which is the ratio of the proposed fall of any archaeological feature to the

nearly in fact as a considerable barrier

nearly at a very close to the actual fall may be at real risk whereas 10

the distance from the proposed fall of any archaeological feature is

these briefly below:

In discussion certain points were raised and it would seem appropriate to list

the factors first-hand.

study will be most useful in the field and assessing all
Despite the very comprehensive baseline information available, a desk-based

INFORMATION EVALUATION

medium sensitivity and rarity value.

features with both high sensitivity and rarity value and a features of
features on map 19 (See also section 6.2.2). These include 10 of the
37% of those features recorded as having rarity value are recorded on the
37% of those features (15 features) have high sensitivity indices.

37 features (2% of the total) are recorded as having rarity value (see section 6.2.2).

predictive criteria of less than 0.000 only routine monitoring is required.

are greater than 0.000 then a management prescription may be required. If
Wall Ditch, so the Ditch is underemphasized by the scoring system (because the Ditch is protected from the trail by a control barrier), which has to assume that walkers will not in fact use the present access;

- the Baseline Survey records some features such as soil type in very general terms. Thus a "mineral soil" may include both clay or sandy soils which will react rather differently to visitor pressure.
and thus in a strict sense

way in the Wei wall, information is only available for one point on the wall

existing information which is available for the use of existing public issues of

will improve access along this section. Table 4.12 is the top of the

by Cynthia Company Council and the possible creation of a new bridge at

that time are interesting. The creation of facilities at Bludworth Roman Fort

the early 1970s and dropped remarkably by the early 1980s, numbers since

these sites. Visitor numbers to sites on the wall appeared to reach a peak in

recorded over a number of years, this helps to illustrate trends in visits to

Table 4.12 lists only those visitor facilities where visitor information is

Table 4.13 lists those facilities and where published the numbers of visits

The largest majority of recorded visits to the wall are to specific facilities.

The wall

Public transport access to the Hadrians Wall National Trail

Route?

Surveys from surveys of National Trails and other long distance

Surveys conducted in all parts of England and Wales

Visitor facilities along the Wall and National car parks

The picture has been built up from the following information

Distribution patterns have been conducted and therefore an incomplete

amount visitor distribution is limited. No comprehensive detailed visitor

Section 2.4. It is important to acknowledge that the existing information

The information is taken from published sources which are referred to in

The following is a review of known visitor distribution patterns for the wall

Visitor distribution: existing information

The physical carrying capacity of the resource

The problems about the establishment of the wall and the likely effect on

the operation of the new track, in assessment of visitor distribution on the

examine visit distribution, the likely changes that may as a result of

This section of the report includes a review of the adapted track

Assessment of potential visitor pressure

Introduction