Heritage, natural capital and ecosystem services: Trent Valley case study

Final Report

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1 Introduction

1.1 Aims and objectives of the case study projects

This project is linked to a series of initiatives being pursued by Historic England which aim to support the heritage sector in engaging with natural capital and ecosystem services methodologies in order to protect the historic environment within future environmental policy.

These initiatives look to identify:

- What need there is for advice, including what the sector (natural environment and heritage sector) wants;
- How the historic environment is included at the moment; and
- How the historic environment might be better included and what this might look like.

There is then a fourth initiative to develop guidance and/or a handbook on best practice and how to deliver the initiatives above.

1.2 Specific aims of this case study

This project involves undertaking a case study to primarily address the third initiative above (how the historic environment might be better included and what this might look like). In addition, the study needs to inform the development of guidance for the heritage sector on how to engage with natural capital and ecosystem services approaches (the fourth initiative).

The overall aims of the case studies are to:

1. Identify the heritage alongside the natural capital associated with these environments. To what extent to the two coincide? What is the relationship between the two?

2. Set out in the language of ecosystem services, what public and environmental goods and services the heritage assets provide (including provisioning, supporting, regulatory and cultural services);

3. Identify other values that fall outside the ecosystem services framework that can be ascribed to the heritage assets;

4. In doing the above, develop a methodology that can be used to ensure that heritage can be reflected in a way that is compatible with natural capital and ecosystem services approaches; and

5. Provide the heritage and natural environment sectors with case study examples of how this might work for different environmental contexts.

1.3 Background

This study fits into a suite of projects that are being funded by Historic England with the aim of identifying if, how, where and when benefits from the historic environment can be captured within

natural capital and ecosystem approaches, and within natural capital accounting. The case studies provide the opportunity to explore how the historic environment links to, feeds off and feeds into benefits being delivered by the natural environment in real-life situations that can test theory and present new issues and challenges that may not otherwise be identified. Case studies also provide an excellent opportunity to involve a wide range of stakeholders, encouraging them to become engaged with current thinking and utilising their perspectives and views to enable the new approaches to be assessed from the bottom-up. As well as empowering local stakeholders, a case study example can also increase awareness of the importance of the historic environment and why it should be captured within decision-making methodologies.

This case study focuses on the Trent Valley within Derbyshire[1]. The Trent Valley comprises a range of environmental contexts but for this study the focus is on the 'water meadows and water management features' context.

The Trent Valley is predominantly a flat, open landscape. The area's characteristics are strongly defined by the river Trent and periodic inundation; the ecosystem services provided reflect this in that they relate primarily to water (availability, regulation of flow, etc.). The area is greatly influenced by past and present industry, with the landscape experiencing significant forces for change over short timescales from housing, infrastructure, the sand and gravel (extraction) industry, agriculture and others.

1.4 Structure of this report

The case study consists of six tasks, with this report presenting the work carried out on Tasks 1 to 5[2]. The remainder of the report is structured as follows:

- Section 2 provides information on setting the scope and the research questions, as well as the tasks undertaken;
- Section 3 shows how this study builds on the previous Trent Valley assessment. It determines how the historic environment was captured previously and then identifies additional heritage assets to be taken into account by this study;
- Section 4 considers the current influence of the historic environment. It links the heritage assets identified in Section 3 to the ecosystem services assessed in the previous study;
- Section 5 draws on the information from Section 4 to identify the values provided by the heritage assets. This includes a summary of the spreadsheet inventory of benefits and a reflection on how the benefits highlighted compare with those assessed in the previous study;
- Section 6 identifies the changes that need to be made to the methodology applied in the previous study to enable heritage benefits to be captured within a natural capital and ecosystem services framework. It then applies the methodology to the Trent Valley case study area through identifying types of benefit and example monetary values relevant to

[1] This area has been chosen to enable the case study to build on work already undertaken for Derbyshire County Council as part of a project to investigate the benefits of implementing the Trent Valley vision.

[2] Task 6 covers project management and production of reports.

two of the heritage assets identified[3]. Consideration is also given to the wider implications of using the methodology in different environmental contexts;

- Section 7 provides a summary of the responses to the research questions;
- Annex 1 provides a map of the study area;
- Annex 2 includes the heritage record spreadsheet (this is provided as a separate Excel file);
- Annex 3 includes the inventory of the types of benefit identified as being appropriate for each of the 20 assets; and
- Annex 4 provides more detailed information on the application of the revised methodology to the Trent Valley case study through identifying the benefit types and relevant monetary values for two of the heritage assets.

[3] Full monetisation of the benefits is not carried out since that would require further data on asset size, level of use, etc. Such information is only likely to be available from a site visit and is thus beyond the scope of this desk based study.

2 Scope, research questions and tasks undertaken

2.1 Overview

This section provides the research questions which set the scope for the study. Note that the geographical boundary of the study area is provided in Annex 1.

This section also provides an overview of the tasks followed.

2.2 Research questions

Table 2-1 provides the final version of the research questions. These were developed from the initial questions provided in the project proposal based on comments from the study team and taking into account the discussions and issues raised during the start-up seminar held at Historic England's offices in March.

Table 2-1: Research questions (v040418)

Research question	Rationale for research question
1. What heritage assets exist within the Trent Valley case study area?	Enables the (known) heritage within the case study area to be identified
2. How do the heritage and environmental assets interact and link with each other?	Enables identification of the environmental assets and an assessment of the inter-linkages between heritage and natural capital
3. How do changes in heritage capital result in changes to natural capital, and vice versa	Enables the relationships between the two types of assets and capital to be investigated and explored with this focusing on impacts on stock, condition of stock, flows of services and the value of the final benefits
4. How can the values provided by the heritage assets be recorded in an ecosystem services framework, such as that used to assess the value of the Trent Valley?	Enables investigation of how the public and environmental final benefits provided by the heritage assets can be reflected within the language of an ecosystems approach, specifically that used to assess the value of delivering the coordinated vision in the Trent Valley
5. What other values do the heritage assets provide that are not captured by the ecosystem services framework?	Enables identification of the full range of benefits offered by the heritage assets and a gap analysis exploring where these values may not be fully captured under ecosystem services
6. What changes need to be made to the methodology so that all of the benefits can be captured?	Enables revisions to the methodology to be identified. Includes assessment of what changes need to be made, how they would have to be incorporated, the implications of the changes (data need, time, skills) linked to approaches to be used to capture all of the benefits
7. How does the Trent Valley and water meadows and water management environmental context show how heritage assets can be taken into account and can influence decision-making	Provides for development of the detailed case study and enables assessment of the implications of the case study locally (e.g. for the County Council, LNP, LEP) and for the water meadows and water management context more generally

Table 2-1: Research questions (v040418)	
Research question	**Rationale for research question**
8. What are the wider lessons for other environmental contexts?	Enables consideration of the generic lessons that can be applied to other environmental contexts, including different heritage contexts, different decision-making contexts, and different decision-makers and the information they need to inform the actions that they propose to undertake

2.3 Tasks undertaken

Table 2-2 below provides a list of the tasks undertaken. Figures 1-1, 1-2 and 1-3 overleaf provide a visual summary of the process for Tasks 2 and 3, Task 4 and Task 5 respectively.

Table 2-2: Task list and key outputs		
Task no.	**Task details**	**Key outputs**
1	Projection inception: - set the scope - set the research questions - inception meeting	Seminar presentation (held in London on 23rd March 2018) Highlight report on Tasks 1 to 3
2	Review Trent Valley assessment and assess how the value of the historic environment is captured	
3	Assess the influence of the historic environment, identify the gaps and where the approach from the previous Trent Valley study works well	
4	Identify the values provided by the historic environment and how they could be captured more comprehensively	Highlight report on Tasks 4 and 5
5	Changes needed to methodologies to enable the values provided by the historic environment to feed in and influence decision-making (includes consideration of how the methodology would be applied to the Trent Valley)	
6	Reporting and project management	Final report (this report) MoRPHE-style stage closure report Final seminar presentation (held in London on 6th November 2018)

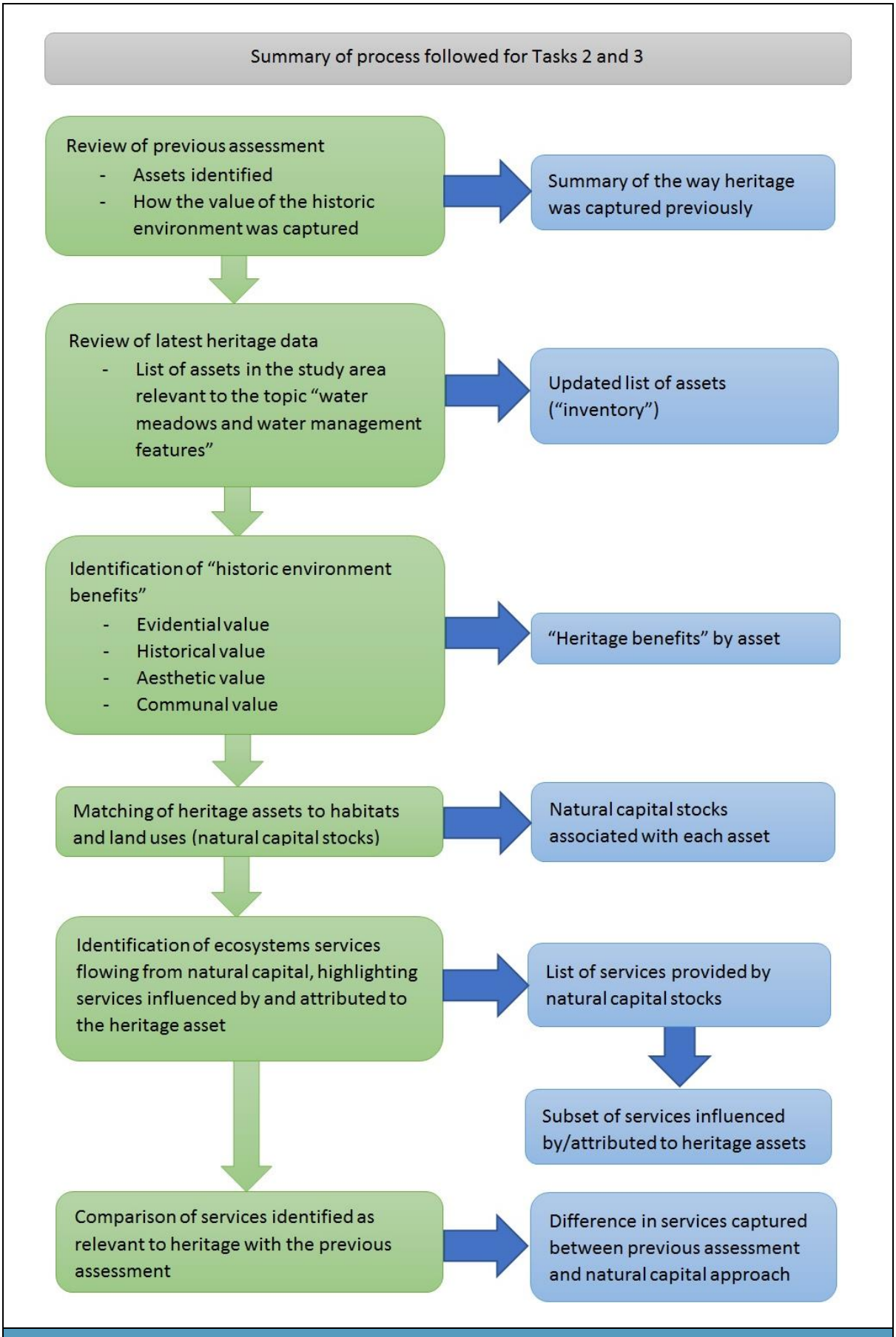

Figure 2-1: Summary of process followed for Tasks 2 and 3

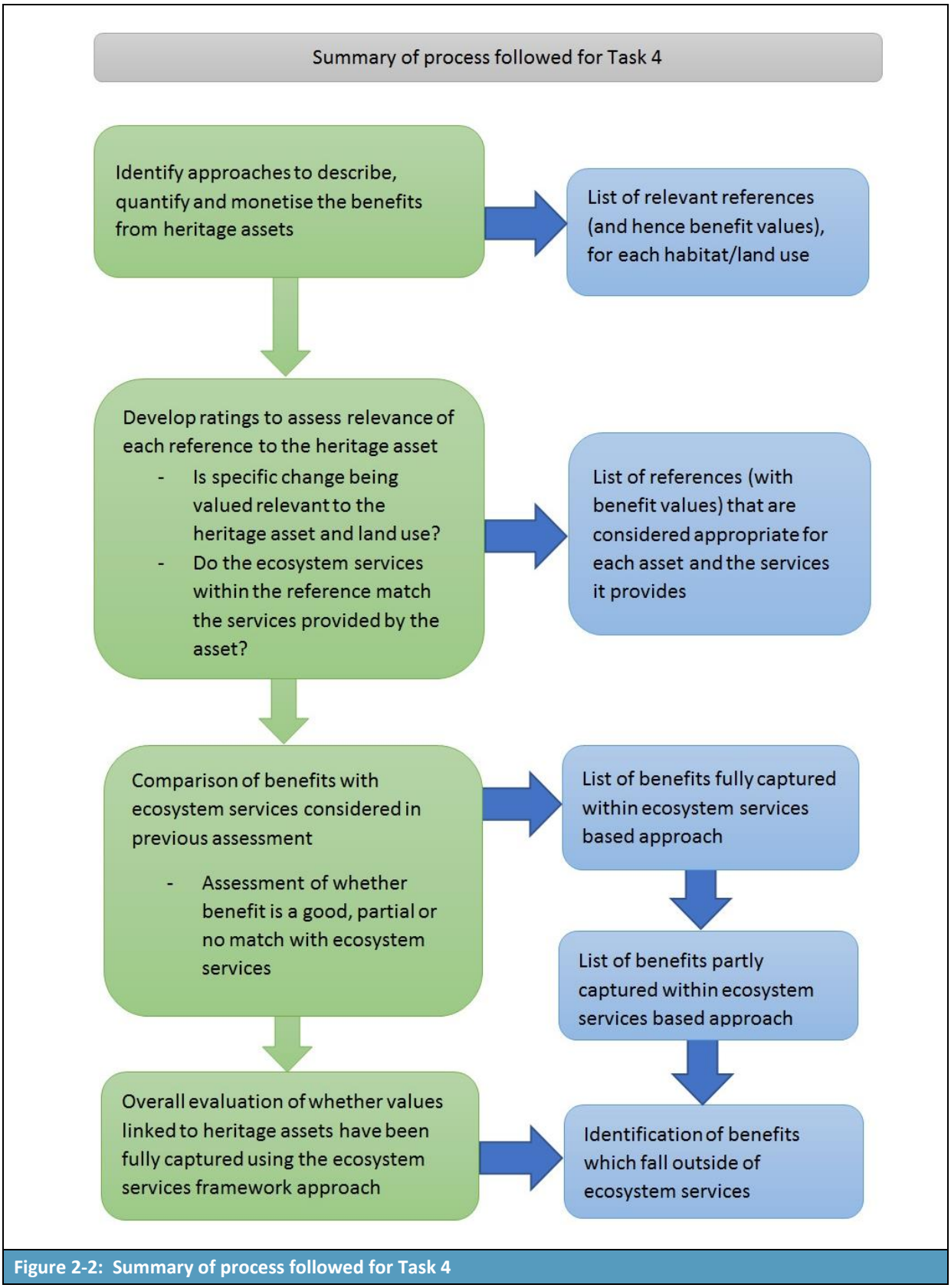

Figure 2-2: Summary of process followed for Task 4

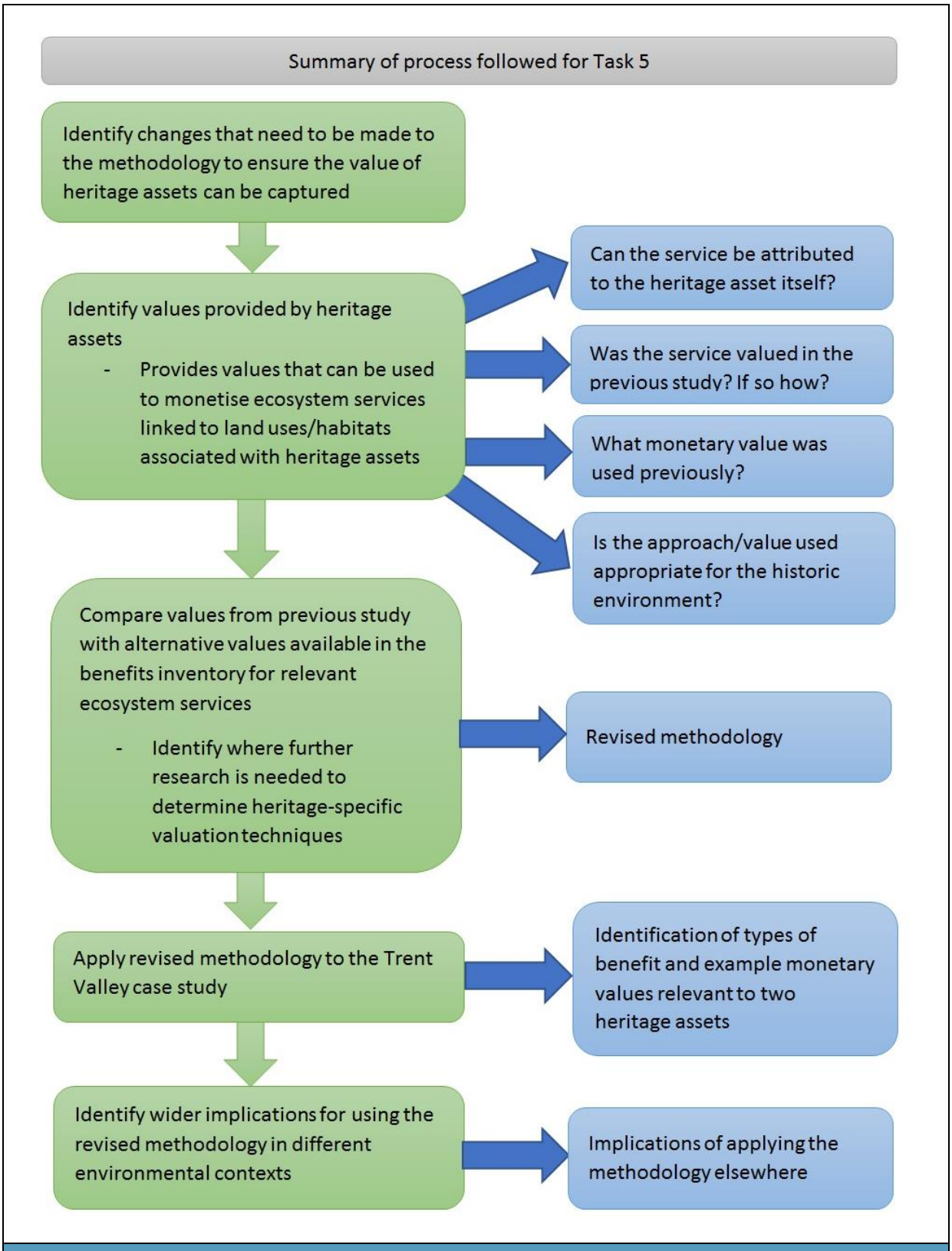

Figure 2-3: Summary of process followed for Task 5

3 Building on the previous Trent Valley assessment

3.1 Overview

Section 3 presents the findings from the review of the previous Trent Valley assessment. It explains how the heritage assets were identified, and also how the benefits from the natural environment were subsequently quantified and monetised.

The section then describes how an updated inventory of heritage assets has been developed for this study, building on the previous Trent Valley work. The historic environment benefits of the assets are described through considering their evidential, historical, aesthetic and communal value. The heritage assets are then linked to land uses/habitats to provide the first stage in the process of identifying the natural capital stocks and ecosystem services likely to flow from them.

To enable learning from the study, issues encountered during this process are also reported.

3.2 Reviewing the previous Trent Valley assessment

3.2.1 Identification of assets

The previous study identified heritage assets using two data sources:

- Historic England data on listed buildings, scheduled monuments, registered parks and gardens, registered battlefields, World Heritage Sites, building preservation notices, and heritage at risk (buildings and other assets); and
- Historic Environment Record (HER) data from Derbyshire County Council (with links to the Heritage Gateway[4]).

The identified assets were recorded in the study baseline and also considered as part of the heritage storylines that were developed. The storylines covered two alternative development scenarios for the Trent Valley: the coordinated scenario where sectors were assumed to work together, and the uncoordinated scenario where sectors were assumed to act individually with potential negative impacts on each other.

3.2.2 Valuing the benefits from the natural environment

The previous assessment used a number of approaches to enable the benefits from the natural environment to be quantified and monetised. Table 3-1 describes the approach and monetary values used to estimate the benefits of each ecosystem service in the previous assessment. Note that this previous assessment looked at a large number of economic sectors and services and was therefore unable to take a detailed approach to each sector or service.

[4] See Heritage Gateway, accessed at: https://www.heritagegateway.org.uk/gateway/chr/default.aspx on 16th May 2018.

Table 3-1: Approach to quantifying and monetising ecosystem services			
Ecosystem service	**Approach to quantifying benefits**	**Monetary values used and source**	**Comments on relevance to this study**
Provisioning services			
Livestock and crop production	Based on gross margin of crops or livestock produced	Gross margins taken from the Nix Farm Management Pocketbook	Approach and values considered appropriate to apply here
Energy production	Based on change in production of electricity	Values based on wholesale market indicators from Ofgem	Approach and values considered appropriate to apply here
Aggregates production	Based on volume of minerals produced by type	Values based on British Geological Survey Minerals Yearbook[5]	Approach and values considered appropriate to apply here
Provision of drinking water	Based on volume of water licensed for abstraction	Values based on £/m^3 of water by use	Approach and values considered appropriate to apply here
Biodiversity (including habitats and species)	Based on habitat type and change in condition of habitat	Values based on £/ha by habitat type from TEEB database[6]	Approach and values considered appropriate to apply here
Regulating services			
Air quality	Based on change in level of pollutants that affect air quality	Values based on study linking increase in happiness from increase in air quality related to level of PM10. Study used is from the USA and is assumed to capture happiness associated with public health impacts, i.e. may go beyond just benefits from improved air quality	Approach is relevant but may require UK-based value to be more relevant, where available
Carbon sequestration	Based on changes in carbon sequestration associated with different land uses under roads, footpaths, arable land and urban soils	Value of CO_2 is based on HM Treasury values for untraded carbon	Approach may miss some key land uses such as grassland, so sequestration data for grassland may need to be added. Value is considered best available

[5] The Yearbook includes total value of production and total production, which can be used to estimate value per tonne.

[6] TEEB is The Economics of Ecosystems and Biodiversity and includes a database of values for different habitat types and different ecosystem services. The values have been collated from international studies such that care is needed when selecting the most appropriate values to apply to the Trent Valley. Also, values have to be converted from € and uprated from 2011 values which is the base date for the values contained in the database.

Table 3-1: Approach to quantifying and monetising ecosystem services			
Ecosystem service	**Approach to quantifying benefits**	**Monetary values used and source**	**Comments on relevance to this study**
Water quality	Based on level of run-off from impermeable surfaces as indication of potentially polluted water	Values based on costs of treating road runoff	Approach unlikely to be relevant here. Need to investigate alternatives such as potential for habitats to filter water and remove pollutants. Values could then be based on costs of avoided treatment
Flood risk	Based on run-off from developed land due to increased rainfall and/or intensity due to climate change	Values based on damages using Weighted Average Annual Damages from the Multi-Coloured Manual[7]	Approach may need to be revised to consider potential for reduced risk of runoff from different land uses, e.g. based on work that has been undertaken on natural flood management. Values associated with damages avoided still expected to be best available
Cultural services			
Educational value	Based on level of achievement and changes in level of achievement	Values are based on benefits of additional qualifications from BIS	Approach may need to be revised to capture value of education trips to heritage assets, but this could also be explored as a premium or specific value of a trip
Heritage value	Based on number of visitors to heritage sites	Values taken from a willingness to pay study for entry to Warkworth Castle[8]	Further investigation needed to see if any new research has been undertaken in this area, and how heritage value of site not open to visitors could be captured

[7] The Multi-Coloured Manual is the tool used in flood risk assessments when applying for Government funding for flood risk management. It is prepared by the Flood Hazard Research Centre at Middlesex University.

[8] This is the main willingness to pay study available for cultural sites and is based on a contingent valuation survey undertaken in 1998 which asked people for their willingness to pay to preserve Warkworth Castle in Northumberland based on payments for entry to the Castle.

Table 3-1: Approach to quantifying and monetising ecosystem services			
Ecosystem service	**Approach to quantifying benefits**	**Monetary values used and source**	**Comments on relevance to this study**
Recreational value	Based on number of day and overnight visits to Derbyshire and Derby	Values taken from total expenditure per day or overnight visit from the ONS for domestic day and overnight visits	Approach may need to be revised to capture the number or proportion of trips that incorporate visits to historic sites or landscapes. Values may need to reflect any premium associated with visits to historic sites or landscapes historic elements
Wellbeing, health and happiness	Based on population with low life satisfaction, drawing on statistics of self-reported life satisfaction in Derbyshire and Derby	Values based on avoided costs of treating depression and anxiety and percentage improvement in condition from treatment[9]	Approach may need to be revised to identify (where available) extent to which heritage sites, sense of identity and green sites associated with heritage assets could affect life satisfaction. If this can be linked to change in life satisfaction, value may be relevant

3.3 Developing the Trent Valley assessment further

3.3.1 Heritage assets identified

An inventory has been made of heritage assets identified as being in the study area and relevant to the theme of "water meadows and water management features". This inventory builds on the heritage asset data used previously but also takes account of assets that have added to the Historic Environment Record since the original Trent Valley study. It includes columns for the following information to be recorded for each asset:

- Name (or description to allow it to be identified where it does not have a specific name, e.g. ridge and furrow between Sudbury and the Dove);
- Description: a short summary of the historic features;
- Status/designation (if any);
- Importance: an overall rating of the current heritage value based on the four aspects (evidential, historical, aesthetic and communal) given above. This is a subjective assessment

[9] Treatment was found in Fujiwara & Dolan (2014) to cost £44,237 per person per year and results in a 40% to 46% improvement in the condition. Depression and anxiety were found to be responsible for a 1.18 reduction in life satisfaction per person. The Mental Health Foundation (2010) reports that impacts last for around two years.

based on professional judgement and assessment of the currently available evidence including internet mapping and photography to take account of likelihood of public access[10];

- National Grid Reference (where available);
- Costs of maintenance or management;
- Condition of the heritage asset: usually a description of potential impacts rather than a rating due to format in which information on condition is available; and
- Historic environment benefits in terms of[11]:
    - **Evidential value**: The extent to which each asset can contribute to an understanding of past activities and how that can contribute to a settlement's wider history. This can either be legible or intangible within the landscape and as such covers the spectrum of heritage assets from historic buildings or structures to the potential for below ground archaeological deposits. The extent to which the impacts of the removal or replacement of the heritage assets within each character area will be considered in terms of the effects on an ability for future generations to understand and interpret the evidence.
    - **Historical value**: The extent to which the heritage assets are legible within the landscape and how they interact: this can include specific aspects of the landscape and individual buildings. Historical associations with events or persons can also add value to the ability of the public and community to engage with the heritage. The extent to which the legibility of the heritage assets has been concealed or altered will also be considered. The opportunities for the use and appropriate management of the heritage assets to enhance local distinctiveness and contribution to the sense of place will also be considered.
    - **Aesthetic value**: Addresses the ability to identify how a place has evolved whether by design or the 'fortuitous outcome of evolution and use'. It assesses the aesthetics of the place through the historic components of the landscape and their ability to enhance sensory stimulation. The aesthetic value also addresses whether the character areas may be amenable to restoration or enhancement.
    - **Communal value**: Communal values can be commemorative/symbolic, social or spiritual. These values are not easily quantifiable being subjective to groups and individuals. Consequently, the value seeks to address the potential for the heritage assets that could be used to engage the community/public with the heritage, but also of the wider area. The potential for each asset to provide material for future interpretation is also considered.

[10] Note that this study is a desk-based exercise. The rating is therefore based on data from internet research and the HER records. The rating therefore reflects the availability of data on the assets. Consequently, it is provided purely for the purposes of this study and may not reflect the actual heritage rating of the asset on the ground.

[11] Based on descriptions included in English Heritage (2008): Conservation principles, policies and guidance for the sustainable management of the historic environment available at https://content.historicengland.org.uk/images-books/publications/conservation-principles-sustainable-management-historic-environment/conservationprinciplespoliciesguidanceapr08web.pdf/ on 13th February 2019.

The heritage dataset includes over 500 individual records relating to listed and non-listed assets within the study area. The records have been assessed and included based on their relevance to the theme of "water meadows and water management features". Since the assets are being taken forward for assessment through the ecosystem services framework in order to identify and classify the benefits generated by heritage, just one example of each type of asset has been included in the inventory; for instance, multiple ridge and furrow assets have been identified in the study area, however just one example has been chosen for inclusion in the inventory since for the purposes of this assessment it is assumed that the benefits generated by a ridge and furrow site are largely similar in all instances.

Certain types of assets have been excluded from the inventory. For example, records which are described as 'possible' or 'no remains visible' have not been included, since this assessment is concerned with known heritage assets only. Portable Antiquities Scheme records have not been included since these do not necessarily relate to heritage assets on the ground, and in any case are inherently no longer in situ. To avoid the risk of double counting, Historic Landscape Characterisation (HLC) records have also been excluded, partly because the study will consider how the assessment methodology might need to be developed further should the Trent Valley's wetland landscape be viewed as a heritage asset itself[12].

Table 3-2 provides a summary of the heritage asset inventory.

Table 3-2: Summary table showing types of heritage assets identified in the study area

Asset name	Comments
Ridge and furrow, between Sudbury and the Dove	Area of ridge and furrow recorded as earthworks. Some is levelled but the west end is better preserved
St Mary's Church (formerly St John's), Marston	13th century church on the site of an earlier church mentioned in the Domesday book, including early font and bell. Benefitted from a Heritage Lottery Fund Grants for Places of Worship of £217,000 in 2015
Coalbrookdale footbridge, Egginton	Very bad condition but with potential to be restored. Initial discussions held with the landowner about options and funding
Twyford henge and Round Hill bowl barrow	Round Hill bowl barrow is a large and reasonably well- preserved example which, although it has suffered some damage to its profile, is still largely intact
Anchor church, Ingleby	Artificial cave system documented mid-17th century, altered and enlarged in 18th century. The 'church' is traditionally connected with an anchorite. It now suffers damage due to graffiti and smoke
Swarkestone Old Hall and garden	No public access. The ruins of the Old Hall and attached walls are in private ownership while the pavilion, The Grandstand, is owned by the Landmark Trust (1998)

[12] This study uses an ecosystem service based approach to look at heritage assets within the Trent Valley; it does not aim to provide a comprehensive review of the study area's historic environment. Use of HLC records would have required quantitative analysis of data to determine the relative rarity of types, followed by the process of assigning heritage values. This could not be accommodated within the budget available for this study. Furthermore, it would have required a fundamental change in approach that would have moved away from the study aims of using the language of ecosystem services to set out the public and environmental goods and services provided by heritage assets, and identifying what other values can be ascribed to such assets.

Table 3-2: Summary table showing types of heritage assets identified in the study area	
Asset name	**Comments**
Swarkestone Lowes barrow cemetery and field system	Poor condition; the earthwork and buried remains have the potential to add significantly to our knowledge and understanding of Bronze Age beliefs, social organisation and the impact these monuments had on the wider landscape both during and after the Bronze Age period
Weston Hall and homestead moat	Building restored and now used as a pub, the Coopers Arms, with a man-made lake for fishing
Cursus complex, Aston upon Trent	The likely Neolithic features were mapped as part of the Derbyshire and Peak District Aggregates Assessment, visible as cropmarks on air photographs
Cropmark complex, Hicken's Bridge, Aston upon Trent	Possibly a Roman camp. Part destroyed by quarrying and extraction activities
Swarkestone bridge and causeway to Stanton-by-Bridge	Condition is fair. Attempts have been made by the Derbyshire County Council to protect the bridge by creating a 7.5 tones weight restriction and 40mph speed limit on this section of the road. Feasibility studies have been undertaken to explore the possibility of bypassing the bridge
Prehistoric landscape, Frizams Lane, Twyford and Stenson	Multi-period settlement site and enclosures; condition unknown
Elvaston Castle and gardens	Operates as a country park open to public access for recreation with 321 acres of open parkland, woodland and more formal historical gardens. Maintained and operated by Derbyshire County Council
Nottingham Road Cemetery	The cemetery remains in use and is maintained to a high standard by Derby City Council
Derby Racecourse Roman vicus and cemetery	Identified as one of only two well- preserved vici in Derbyshire and has a very rich associated Roman cemetery which has already yielded considerable evidence of the size, age range, sex and wealth of the population associated with the vicus and fort
Springfield Mill Factory and Chimney	This former mill was built in 1888 as a lace factory, it has now been converted into residential units
Cranfleet Lock	Lock chamber and gates built as part of the Cranfleet Canal
Canal Milepost	Erected as part of a series of mileposts on the Trent and Mersey Canal
Pump House, Elvaston Country Park	Restored by Dorothea Restorations assisted by Derbyshire Archaeological Society and Leicester Industrial History Society in the mid-1970s, but currently no longer in working order
Darley Abbey Weir	A fish pass was installed in 2015 to provide free upstream and downstream passage for all species of fish at Darley Abbey weir including eel. This will contribute significantly to the waterbody target of Achieving good ecological potential by 2027

Table 3-3 (overleaf) presents more information on each of the assets as well as an overview of the historic environment benefits they provide. Full details are available in the spreadsheet included as Annex 2. Note that some details on the assets, in particular condition information and the factors that affect condition, were difficult to obtain.

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Ridge and furrow, between Sudbury and the Dove	
Description	An extensive area of ridge and furrow was recorded in fields to the south of Sudbury Park lake. There was a distance of c. 7m-12m between the crests of the ridges, which ran generally east-west and occasionally north-south. There was a height of up to 0.5m from furrow to top of ridge[13]
Status	Non-designated (Derbyshire HER: 26614)
Importance	Locally important
Condition	Poor; declining
Evidential value	The asset has evidential value as an archaeological feature in its own right, providing evidence on the formation processes, date and length of use of the open field system to which the cultivation ridges relate. In addition, the presence of relatively intact medieval/post-medieval field systems suggests that the land has not been extensively ploughed in recent times – meaning that the potential for preservation of underlying archaeological remains relating to earlier periods is elevated
Historical value	The asset has some historical value in illustrating the medieval system of open fields, into which the Sudbury Hall designed landscape was inserted from the 17th century onwards – and from which the wealth of the estate was partially drawn
Aesthetic value	The asset has some aesthetic value in adding the perception of time-depth to the landscape, in addition to contributing to the setting of Sudbury Hall
Communal value	The asset is unlikely to have significant communal value as it may not be recognised by the majority of the population as being of archaeological interest or comparatively ancient origin
St Mary's Church (formerly St John's), Marston	
Description	Parish church. C11, C14, C15; Restored 1885-8 by William Butterfield
Status	Listed, Grade I (NHLE: 1109001; HARR: 13283)
Importance	High – nationally important
Condition	Poor; on Heritage at Risk Register (13283), awarded an HLF Places of Worship grant in 2015 to tackle structural issues, restore rainwater goods and deal with vegetation ingress/damage. Remains on Register (but this may be due to lack of resurvey)
Evidential value	Likely high levels of archaeological potential associated with early church (dependent on location in relation to later structures). Churchyard of high archaeological value and potential. The structure itself has considerable evidential value in terms of evidence on a range of building techniques associated with early ecclesiastical architecture, and the potential scientific value (e.g. dendrochronology) from large structural timbers

[13] Beamish, H & Smith, L (The National Trust), 1985, *The National Trust Archaeological Survey: Sudbury Hall, Derbyshire, p 22* (Unpublished document).

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Historical value	The church has considerable historical value in illustrating the evolution of the asset in line with the needs of the local community and the actions of benefactors. The tombs and wall tablets contained therein provide clear associative links with local historical figures. The church has a bell cast in 1366 by John of Stafford; a rare survival and a link to an important medieval bell foundry. The church also contains an important 17th century pipe organ, originally from Sudbury Hall and later Sudbury parish church
Aesthetic value	The asset has very high aesthetic value, representing a fine example of a parish church with a very long sequence of development and evolution. This depth of time, visible in the building fabric, creates a rich and varied architectural texture. The 11th century sculpture and decoration is of particular interest, along with a range of 14th and 15th century features
Communal value	Public access is good, the church is still in use and is likely to have considerable communal value to the congregation in particular and the wider community – as a site of family weddings, baptisms and funerals, in additional to more general worship and community activities
Coalbrookdale footbridge, Egginton	
Description	Footbridge 1812. Iron pedestrian footbridge made by the Coalbrookdale Company for the former Egginton Hall estate. Elliptical arch. Spandrels of pierced design with diminishing circles. In the centre of the arch on either side is inscribed "Coalbrookdale 1812". Six principal balusters remain from twelve originals, each having a tapering shaft, square in section, with twisted fluting and being secured to the principal arch with ornate fish-tailed scrolls (5 remain). All intermediate twisted balusters are missing. A small section of handrail is still in situ. The-bridge spans the remains of the weir and sluices of Egginton Hall Lake. Birch abuttments; 2 arched sluice to Egginton with engineering brick cutwaters
Status	Listed Building, Grade II* (NHLE: 1140125) On Heritage at Risk register (HARR: 46155)
Importance	High – regionally/nationally important
Condition	Very bad; structurally unsound
Evidential value	The asset has evidential value in providing a comparatively rare example of an intact – albeit somewhat degraded – relatively early cast iron bridge, produced by the iconic Coalbrookdale Company. It provides evidence of the cutting-edge casting, construction and structural engineering techniques available in the early 19th century
Historical value	The bridge is a good, and comparatively rare example of an early 19th century cast iron bridge, illustrating the development of iron as both a decorative and structural material; it is the work of one of the foremost foundries of its day; the Coalbrookdale Company (credited with operating one of the first successful blast furnaces in Europe and, through Abraham Darby III, was responsible for the world's first cast iron bridge – the iconic Iron Bridge spanning the River Severn)
Aesthetic value	The asset has considerable aesthetic value, as both a pleasing and elegant design and a fine example of cast ironwork. However, this has been compromised by its poor condition: Six principal balusters remain from twelve originals, each having a tapering shaft, square in section, with twisted fluting and being secured to the principal arch with ornate fish-tailed scrolls (5 remain)
Communal value	The extent to which communities understand and value the asset is unclear. Provision of cultural services such as heritage and recreational value, along with aesthetic experiences. Potential for public engagement with asset and provision of material for future interpretation including wider Egginton Hall estate

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Twyford henge and Round Hill bowl barrow	
Description	Twford henge is a good example of a Class II henge[14] which, although disturbed by past and current agricultural practices, nevertheless retains substantial archaeological remains, both in the buried ditch and on the old land surface preserved beneath the later bowl barrow. Bowl barrows are prehistoric funerary monuments which date from the Late Neolithic to the Late Bronze Age (c.2400-1500 BC) and were constructed as hemispherical mounds of rubble or earth covering single or multiple burials. Sometimes ditched, they occur either in isolation or grouped as cemeteries and often acted as foci for burials in later periods. Often superficially similar, though differing widely in size, they exhibit regional variations in form and a diversity of burial practices. There are over 10,000 surviving bowl barrows recorded nationally, with many more having already been destroyed. Their considerable variation of form and longevity as a monument type provide important evidence on burial practices and social organisation among early prehistoric communities. They are particularly representative of their period and a substantial proportion of surviving examples are considered worthy of protection. Round Hill bowl barrow is a large and reasonably well- preserved example which, although it has suffered some damage to its profile, is still largely intact. Both the barrow and the henge are important, not only in their own right, but as elements in a wider prehistoric ritual landscape which survives in the surrounding area. The henge does not survive as an upstanding feature but its construction ditch has been identified from aerial photographs and survives as a buried feature beneath modern horticultural land. It encloses a roughly circular area and has an external diameter of c.80m. Opposing entrances have been identified on the north-west and south-east sides and, formerly, a bank followed the outer edge. The centrally placed bowl barrow includes a roughly circular earthen mound with an average diameter of c.30m and a height of c.3m. No recorded excavation of the barrow has been carried out but its form assigns it to the Bronze Age
Status	Scheduled Monument (NHLE: 1011436)
Importance	High – nationally important
Condition	Fair-Poor; generally well-preserved but damage as a consequence of animal burrowing
Evidential value	The asset has very high archaeological value, in terms of the potential for extensive deposits contained within cut features, particularly the henge ditches (which, on excavated sites, have been found to accumulate material derived from feasting and other ritual activity); the spatial, physical and temporal relationships between the two features, including the potential for old ground surfaces to be preserved beneath the barrow; in addition to the potential for preservation of burials and grave goods. There is also significant potential for palaeoenvironmental remains, providing evidence of the environmental history of the area when the monuments were constructed. Both the barrow and the henge are important not only in their own right but as elements in a wider prehistoric ritual landscape which survives in the surrounding area
Historical value	The asset has considerable historical value in illustrating the physical form and construction techniques of the bowl barrow – a widespread, but disparate monument type. Most importantly, it illustrates the way in which later (likely) Bronze Age communities responded to the monuments of past societies (the henge – likely of Neolithic date); seeking to place a communal funerary monument within the boundaries of an earlier ritual site
Aesthetic value	The bowl barrow remains a large, impressive and readily identifiable feature and makes an important contribution to local landscape character, in contributing to a sense of 'time depth'

[14] Neolithic ritual structure, the diagnostic features of which are a large ditch and external bank; class 2 henges have two entrance causeways across the ditch.

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Communal value	Visible remains with good potential for the historic asset to be used to engage the community/public; ritual and funerary monuments have the potential to capture the imagination as seemingly enigmatic structures, somewhat removed from the cultural practices of modern societies
Anchor church, Ingleby	
Description	Natural cave, enlarged and formed into a folly. Late C18. Sandstone. A roughly rectangular room carved out of the cliff of the escarpment south of the River Trent. Round arched doorway and various roughly rectangular window openings. The interior is hollowed out into two rooms divided by a two-bay 'arcade'. The 'church' is traditionally connected with an anchorite
Status	Listed Building, Grade II (NHLE: 1096534)
Importance	High – regionally important
Condition	Fair; declining – interior damaged by graffiti and smoke
Evidential value	The asset has some evidential value in that there may be archaeological deposits relating to its construction preserved within the cave system. It may also yield information in terms of the construction techniques applied in adapting and expanding the natural caves to form the church. Similarly, there may be further archaeological evidence within the wider cave system relating to the reputed use of the caves by early Christian clerics (the site is associated with the 6/7th century Anchorite hermit, St. Hardulph) and monastic outcasts, or indeed any previous use of the caves by human communities
Historical value	The asset has considerable historical value in terms of its possible associations with early Christian figures, with wider significance in terms of the history of the Kingdom of Northumbria. It is also valuable in illustrating the 18th century fashion for the creation of follies to enhance the aesthetic experience of the aristocracy – in this case, by the Burdett family of the nearby Formarke Hall. The cave is also featured in a 1745 work by Thomas Smith[15], a Derbyshire landscape painter and engraver, and appears in the title of a George Turner (1875) painting[16]. Both artists are regionally important, with Turner dubbed 'Derbyshire's Constable'
Aesthetic value	The 'church' was specifically augmented to create a compelling aesthetic experience, adding to the natural drama of the rock outcrop and caves above the River Trent. It therefore has substantial aesthetic value
Communal value	The asset is publicly accessible, and is a well-known and valued asset – albeit one that has been somewhat mistreated by some visitors

[15] Royal Academy, A View of Anchor Church, published 25 August 1745 accessed at https://www.royalacademy.org.uk/art-artists/work-of-art/a-view-of-anchor-church on 17th August 2018.

[16] Artnet, Fishing on the Trent near Anchor Church, Ingleby, Derbyshire (1875) accessed at http://www.artnet.de/k%C3%BCnstler/george-turner-the-younger/fishing-on-the-trent-qILIUoafjNiw74UZEAmfeA2 on 17th August 2018.

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Swarkestone Old Hall and garden	
Description	An early C17 pavilion and walled enclosure, and walled gardens relating to Swarkestone Old Hall. Swarkestone Old Hall was the home of the Harpur family. The family moved to Calke Abbey (qv) in the C17 after the Civil War and the building was leased out before being partially demolished in 1746-7. The attached garden walls fell into disrepair and are now in ruinous condition (1998). The ruins of the Old Hall and attached walls are in private ownership while the pavilion, The Grandstand, is owned by the Landmark Trust (1998). Swarkestone Old Hall, which was probably built during the C16, survives as a wall with windows and a chimney breast to which walls are attached (ruins and attached walls listed grade II*). The gardens associated with Swarkestone Old Hall fall into two areas, the former gardens enclosed by walls attached to the ruins of the Old Hall (listed grade II*), and a pavilion or banqueting house called The Grandstand and its attached walls (listed grade I), which lies c 170m north of the Old Hall
Status	Listed Building, Grade I: The Grandstand, and associated structures (NHLE: 1088345); Listed Building, Grade II*: Old Hall and attached walls (NHLE: 1280604); Within Swarkestone Old Hall Registered Park and Garden; Grade II*(NHLE: 1000685)
Importance	High – nationally important
Condition	The Grandstand: good; Old Hall: poor (on Heritage at Risk Register)
Evidential value	The asset has evidential value in relation to garden archaeology associated with the rectangular enclosure to which the pavilion is connected (interpreted either as a bowling green, performance space for masques or alternative as an enclosure for bull-baiting (Pevsner 1978)). Similarly, the remains of the Old Hall are likely to have high archaeological potential
Historical value	The asset has considerable historical value in illustrating a comparatively rare example of Jacobean garden and pleasure-ground architecture. Its association with the Swarkestone estate and the Harpur family is well-attested, and estate records contain entries describing payment of more than £110 to mason Richard Shephard for a 'bowle alley house' in 1630-2 – interpreted as being the Grandstand. It has been suggested that, due to stylistic affinities with the Little Castle at Bolsover Castle, that John Smythson may have been the architect. Smythson was the son of Robert Smythson, the architect and stonemason of a number of the great Elizabethan houses including Longleat, Hardwick Hall, Wollaton Hall and Burton Agnes Hall
Aesthetic value	The asset has very high aesthetic value, comprising the highly attractive symmetrical composition of The Grandstand and the high quality walls enclosing the pleasure grounds, contrasting with the ruins of the Old Hall
Communal value	No public access. The ruins of the Old Hall and attached walls are in private ownership while the pavilion, The Grandstand, is owned by the Landmark Trust (1998). It is likely that the asset has some communal value, but the extent to which it is understood and appreciated by local people is unclear

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Swarkestone Lowes barrow cemetery and field system	
Description	The Bronze Age barrow cemetery known as Swarkestone Lows is the only known example to survive in the Trent Valley. Although parts of the site have been denuded by ploughing, significant remains will survive beneath the present ground surface. The monument is visible as a series of earthworks and cropmarks, the latter being evident from aerial photographs. Four barrows are visible as upstanding earthworks, the largest and most prominent measuring approximately 91.5m in diameter and 3.6m in height[17]. This barrow is under pasture and is situated towards the western end of the monument. The remaining three barrows lie within an arable field and have been denuded by ploughing to heights ranging from 1m to 0.4m. Cropmarks indicate that each of these was encircled by a ditch ranging in diameter from 26m to 34m. The ditches would have provided raw material for the mounds and served as a symbolic boundary to them
Status	Scheduled Monument (NHLE: 1019060)
Importance	High – nationally important
Condition	Poor; under arable
Evidential value	The monument includes earthwork and buried remains of Swarkestone Lows, the only known Bronze Age round barrow cemetery to survive in the Trent Valley. The monument also includes the buried remains of Bronze Age occupation and part of an Iron Age aggregate field system. It is situated on the crest of a narrow east to west ridge of Triassic Mercia Mudstone which rises approximately 15m above the River Trent to the south and Sinfin Moor to the north. The asset has nationally important evidential value. The survival of the stratigraphic relationship between the barrow cemetery, Bronze Age occupation area and Iron Age boundary ditch and field system is rare. Such a relationship provides important information about the continuity and change of settlement and land use over time, in addition to potentially aiding understanding of how the remains of past occupation was interpreted, respected or re-used and reinterpreted in later periods
Historical value	The asset has considerable historical value in illustrating the relationship between Bronze Age funerary complexes and lowland river valleys – a comparatively rare location for a monument type more generally associated with more prominent locations (although the cemetery is located on a low promontory)
Aesthetic value	The asset has some aesthetic value, with the larger upstanding burial mounds at the western end of the complex readily visible in the landscape. They therefore make an important contribution to local landscape character
Communal value	The asset is likely to have considerable value to local people interested and engaged with the archaeology of the area – as a large and very rare example of the type. However, the general public may have a less well-developed understanding and appreciation of the asset and its significance
Weston Hall and homestead moat	
Description	Large, unfinished, red brick country house. Early C17 with minor later alterations and converted to a public house (Cooper's Arms). The moat, potentially associated with an earlier house on the site of the extant 17th century house, has been infilled. Earthworks, potentially associated with medieval village shrinkage, have also been lost

[17] Dimensions from NHLE entry – likely a typographical error.

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Status	Listed Building, Grade II* (NHLE: 1088352)
Importance	High – at least regionally important
Condition	Mixed/poor; on Heritage at Risk Register as upper floors are vacant with decay evident in floor structures. Historic England grant funding for repairs to a key structural beam and C17 staircase
Evidential value	The asset is likely to have some evidential value, as the homestead moat – although filled in – may be extant to some degree
Historical value	The asset has considerable historical value, in that it has extensive associations with both the Roper family – its original owners and commissioners – and the narrative of their unfortunate decline, necessitating the sale of the incomplete house in 1649. The house was reputedly used as a barracks for the soldiers when Civil War fighting broke out in Weston in 1644. It is, in some ways, fossilised in its unfinished state – although later ground-level additions may obscure this slightly. It has been interpreted as being originally conceived as an H-plan mansion, but only one side wing and a single bay of the central wing appears to have been completed. This provides an interesting insight into the way in which 17th century builders went about erecting large country houses and the potential ability of proprietors to occupy such structures on a phased basis. There are comparatively few examples of unfinished country houses of any period, and those that exist have a special, somewhat romantic quality – albeit this is less the case in this instance as the building has been adapted and is in active use
Aesthetic value	The house is a fine example of a 17th century provincial country house of somewhat ambitious scale. Although unfinished, and obviously so, this adds to the character of the asset and is readily understandable to the viewer – adding to the aesthetic experience, in addition to aiding understanding of the asset's story
Communal value	Building now used as a pub, the Coopers Arms, with a man-made lake for fishing. The asset is likely to have communal value as part of the historic heart of the village, and through its function as a public house
Cursus complex, Aston upon Trent	
Description	Cropmark Iron Age settlement and Neolithic cursus. A cropmark complex to the east and southeast of Aston Upon Trent, and west of the River Trent (Trent and Mersey Canal), and circa 1.5 km in extent. The most notable feature is the Aston Cursus. A range of ring-ditches and enclosures are also visible. Rectilinear ditched enclosures or boundaries may represent fields of later prehistoric or Roman date. The features were mapped as part of the Derbyshire and Peak District Aggregates Assessment, visible as cropmarks on air photographs. The features comprise a Neolithic cursus and barrow; later prehistoric/Roman circular enclosures (some of which are possible barrows) and pits. A later prehistoric/ Roman field system and probable settlement superimposes the cursus and consists of field boundaries, pit alignments, rectilinear and curvilinear enclosures, and trackways
Status	Scheduled Monument (NHLE: 1003279)
Importance	High – nationally important
Condition	Unknown; in arable use therefore potential for continued plough damage to cut features

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Evidential value	The asset has very high evidential value, providing valuable information on a comparatively rare form of Neolithic ceremonial structure – the cursus. Interpretations as to the use and longevity of these structures vary; therefore comparatively well-preserved examples have significant potential to add to our understanding of the monument type, its date, function and relationships with other broadly contemporary monuments (e.g. the barrow). Similarly, the spatial and temporal relationship between the cursus and the Iron Age settlement and field system could yield valuable information as to the extent to which the earlier monument was visible, interpreted/understood and potentially re-used over two thousand years later
Historical value	The asset has considerable historical value in illustrating the form and potential function of an uncommon and highly important form of Neolithic ceremonial site
Aesthetic value	The assets have negligible aesthetic value, as they are not generally perceptible on the surface – being preserved solely as cropmarks
Communal value	Public engagement with asset unlikely due to agricultural land use
Cropmark complex, Hicken's Bridge, Aston upon Trent	
Description	A complex round barrow with three concentric ditches; two subsidiary circles to the west. Immediately adjacent to the north, a rectangular enclosure apparently with rounded corners, possibly a roman camp. All of these features are on a small elevated piece of ground. Other linear features are visible in the same field. Prehistoric elements are potentially related to the nearby Aston cursus complex
Status	Scheduled Monument (NHLE: 1007034)
Importance	High – national importance
Condition	Unknown
Evidential value	Evidential value is unclear due to condition
Historical value	Part destroyed by quarrying and extraction activities
Aesthetic value	Negligible, as not readily discernible on the surface
Communal value	Public engagement with asset unlikely due to agricultural land use
Swarkestone bridge and causeway to Stanton-by-Bridge	
Description	Swarkestone Bridge and Causeway; Bridge and causeway three quarters of a mile long. A bridge is first referred to in 1204. The present causeway dates from the late C13 or early C14. The bridge itself was destroyed by floods in 1795 and replaced 1795-7 by a new bridge probably designed by Thomas Sykes, the County Surveyor. Repairs 1682, repairs and widening 1799, 1808, 1830, 1852-4 and blue brick strengthening arches inserted 1899
Status	Listed Building, Grade I (NHLE: 1088337) Scheduled Monument (NHLE: 1007076)
Importance	High – national importance
Condition	Fair; on Heritage at Risk Register. Bridge at risk from the volume of traffic. Damage to parapets occurring from regular road traffic collisions. Further traffic calming measures and enforcement of weight restrictions are required. Repair and maintenance programme underway within the terms of a management agreement

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Evidential value	The asset has considerable evidential value, in that a substantial amount of medieval fabric remains on the causeway – providing valuable evidence of C13/14 engineering and secular masonry (the vast majority of surviving medieval stone buildings being ecclesiastical). The bridge also preserves part of the pre-Conquest route between Derby and Coventry, and comprised part of the later King's highway between those settlements
Historical value	The asset has very high historical value, illustrating the lengths to which the Crown was prepared to go to secure this section of the road network, with Royal grants for tolls to fund bridge repair granted between 1324 and 1347; in addition to the feat of engineering required to span both the Trent and its extensive flood plain. As the only crossing on the Trent between Burton-on-Trent and Nottingham, the bridge carried the main road from the South until the 18th century. It is associated with a minor skirmish during the Civil War (in 1643), and marks the southernmost point of Charles Edward Stuart's ('Bonnie Prince Charlie') advance during the 1745 Jacobite rebellion. It is the longest stone-built bridge, and the longest inland bridge, in England
Aesthetic value	The asset has considerable aesthetic value as a unique, and locally-distinctive, piece of largely medieval architecture. It also makes a significant contribution to local landscape character, providing a sense of considerable time-depth
Communal value	Public access to the asset is good. Provision of cultural services such as heritage, educational and recreational value. It has the potential to be bound up in local identities, as a highly distinctive asset
Prehistoric landscape, Frizams Lane, Twyford and Stenson	
Description	A complex of ring ditches (27402) and enclosures (27403) at SK 318 291, first discovered by St Joseph from the air, was investigated by Hughes and Kay. A ring ditch visible on the air photograph measured over 80 feet in diameter; a rectangular enclosure with two openings, interpreted as a stock enclosure. Smaller circles were thought to represent huts of the Romano-British period. A limited excavation revealed only one piece of Iron Age pottery, but some fragments of Derbyshire ware were found on the surface, turned up by the plough. The Royal Commission records rectangular enclosures attached to a straight ditch line at SK 321 290. (1-4)
Status	Scheduled Monument (NHLE: 1007028)
Importance	High – national importance
Condition	Unclear
Evidential value	Asset has significant evidential value, providing archaeological evidence of an extensive Iron Age settlement complex
Historical value	The asset has some historical value in illustrating later prehistoric settlement and land use – albeit that this can only be perceived from aerial photography
Aesthetic value	Under arable, therefore has negligible aesthetic value
Communal value	Public engagement with asset unlikely due to agricultural land use

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Elvaston Castle and Gardens	
Description	Country house, now part of country park. 1633 and early C18, with major refashioning in Tudor style by James Wyatt of c1817, completed after his death by Walker and east front of c1830 to 1840, probably designed by L N Cottingham, plus C211 alterations, including demolition of north-west wing in 1970. Built for the Earls of Harrington. Set within extensive formal gardens and pleasure grounds laid out 1830-51 by William Barron for the fourth Earl of Harrington. The gardens were created using many mature trees which were transplanted by methods pioneered by Barron's mentor at the Edinburgh Botanic Gardens, William McNab, and developed by Barron
Status	Listed Building, Grade II* (House); large number of subsidiary garden and estate features listed separately (NHLE: 1334604) Registered Park and Garden, Grade II* (NHLE: 1000404)
Importance	High – regional/national importance
Condition	Declining; on Heritage at Risk Register
Evidential value	The asset has some evidential value in terms of archaeological remains related to the various phases of building on the estate, and in terms of garden archaeology chartering the development of the pleasure grounds and formal features
Historical value	The asset has significant historical value in terms of illustrating the development of early modern – 19th century estate centres, and the relationship between architectural and landscape interventions. The asset is associated a range of historical figures, most notably the Earls of Harrington. It has been worked on by a number of noted designers, including Gothic Revival architect James Wyatt
Aesthetic value	The asset has high aesthetic value, as a harmonious and pleasing composition of architecture and landscape design
Communal value	Operates as a country park open to public access for recreation with 321 acres of open parkland, woodland and more formal historical gardens
Nottingham Road Cemetery	
Description	The urgent need for more burial space for the city prompted the formation of the Derby Burial Board in 1853 and led to the establishment of the first municipal cemetery in Derby. Situated then in the parish of Chaddesden, between Nottingham Road and the Derby Canal, the cemetery originally occupied 32 acres (c 13ha) of land. The buildings were designed by Henry Isaac Stevens FRIBA (1806-73), an acclaimed Derby architect with an extensive practice (Craven 1998)
Status	Registered Park and Garden, Grade II (NHLE: 1001610)
Importance	High – regional importance
Condition	Good
Evidential value	The asset has some evidential value in terms of graveyard archaeology, although the site is in active use and is post-1850

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Historical value	The asset has considerable historical value in illustrating the need for municipal – rather than ecclesiastical – burial space, and the centralised planning of how to deal with the increasing numbers of deceased created by the ever-growing populations of industrial centres like Derby. The buildings were designed by Henry Isaac Stevens FRIBA (1806-73), an acclaimed Derby architect with an extensive practice (Craven 1998). The grounds were planted out by a Mr Lee of Hammersmith (Derby Mercury 1855), possibly following advice from William Barron (1800-91): 'The grounds are tastefully laid out, and planted with evergreens and shrubs, under the able inspection of Mr Barron, of Elvaston Gardens' (Glover 1858). Barron had been the head gardener at Elvaston Castle (qv) since 1840. The cemetery was consecrated by the Bishop of Lichfield in April 1855, and opened on 1 May 1855 with 8 acres (c.3ha) left unconsecrated for non-denominational and Catholic use. In the first extension of the cemetery in 1880 a further 10 acres (c.4ha) were added, followed by a second extension of 9 acres (c 3.5ha) in 1898. In 1895, the Corporation took over the cemetery from the Derby Burial Board. By 1900 at least eleven gardeners were needed to maintain the grounds (Cholerton 1999). Many of the monuments in the cemetery were executed by Joseph Barlow Robinson (1821-83) who worked as a carver for Pugin & Barry on the Palace of Westminster before returning to Derby to set up the Midland Sculptural and Monumental Works. Further extensions to the cemetery occurred in 1921 and 1936
Aesthetic value	The asset has considerable aesthetic value as it has a strong design concept and has been laid out to be a peaceful, attractive parkland cemetery
Communal value	The asset is likely to have considerable communal value as large numbers of local people's relatives are likely to be interred in the cemetery, and it continues in active use
Derby Racecourse Roman vicus and cemetery	
Description	Located c.600m east of the Roman fort at Little Chester (*Derventio*), the site is a vicus, or small civilian settlement, situated on the Roman road from Little Chester to the Trent at Sawley. Excavations carried out on part of the site between 1968 and 1974 have revealed it to be a Roman industrial settlement, specialising originally in pottery and later in metalworking, with an associated cemetery. Pottery production indicates that industrial activity began with the settlement's creation c.AD90 and lasted until the mid-second century when metalworking took over as the most important industrial activity. This continued until the settlement's decline in the mid-fourth century. The latter period of occupation, from the second to the fourth centuries, is reflected in the area of the cemetery excavated. This revealed a line of five mausolea near the Roman road and an open cemetery to the north with both cremation and inhumation burials, three of which contained military dress-fittings. An area of a walled cemetery containing a mixture of inhumations and cremations was also located slightly further north of the main complex
Status	Scheduled Monument (NHLE: 1012582)
Importance	High – national importance
Condition	Unknown
Evidential value	The asset has very high evidential value. The Derby Racecourse site is an important example of a fort-vicus, they were important centres in which native people settled in order to provide goods and services to the moneyed Roman troops – stimulating local economies, driving the adoption of currency and entailing part of a wider package of 'Romanisation' that characterised the Romano-British period. The associated cemetery offers highly significant insights into the social composition of vici, including their origins (e.g. through strontium isotope analysis of skeletal material), sex and potential causes of death (pathologies, injuries etc). The site remains largely unexcavated and therefore has significant archaeological potential

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Historical value	An extramural civilian settlement attached to the nearby fort of *Derventio* at Little Chester. Fort-vici are rare nationally, with less than sixty identified examples, and are situated almost exclusively in frontier regions where conditions were not secure enough for fully-fledged towns to develop. Its illustrative value is inevitably reduced as the asset is not perceptible on the ground
Aesthetic value	The site is largely imperceptible on the ground
Communal value	The extent of public knowledge and appreciation of the asset is likely to be low
Springfield Mill Factory and Chimney	
Description	Red and yellow brick with red, yellow and blue brick and stone dressings. Hipped slate roofs, partly replaced in corrugated asbestos with red and yellow corbelled and dentilled eaves cornice. Four storeys and 41 bays, with five central bays pedimented and built of contrasting yellow brick instead of the red brick used elsewhere. Attached to centre of building is a lower wing which in turn attaches to the engine house which has semi-circular headed windows with circular one in the gable over, and a louvred ridge vent. From this runs a large pipe which connects to a very tall brick chimney. This has a deep square brick base with a large moulded stone plinth, over which is the tall tapering octagonal stack with moulded band near the top and a richly corbelled crown. Interior of factory has wooden floors on cast iron columns. Engine with rope drive to all floors removed c1940. Total capacity of the factory was originally 160 machines
Status	Listed Building, Grade II (NHLE: 1428651)
Importance	High – regional importance
Condition	Good, converted to residential use
Evidential value	The asset is likely to have some evidential value with regard to industrial archaeology associated with the construction, phasing and use of the building and associated infrastructure
Historical value	Built for Terah Hooley, a wealthy local industrialist, by architect John Sheldon of Long Eaton. The mill has value in illustrating 19th century industrial / mill architecture
Aesthetic value	The asset has aesthetic value as an impressive example of 19th century industrial architecture, it is of pleasing proportions and rhythmic composition.
Communal value	Currently in use as residential units; Derby's mill heritage is an important aspect of local history and identity
Cranfleet Lock	
Description	Canal lock chamber and gates, built as part of the Cranfleet Canal, 1797. Ashlar, partly rebuilt in engineering brick, with metal and wooden gates. Wide chamber with drop of about 15 feet between levels, in good repair but with concrete copings. There are iron steps to either side, and small iron bollards along the sides of the chamber. Wooden gates to either end have metal reinforced balance beams with rack and pinion paddle mechanisms and metal handrails, also with wide plank walkways to west sides. To side of each gate is a semi-circle of concrete with brick steps
Status	Listed, Grade II (NHLE: 1087935)
Importance	High – regional importance
Condition	Functioning

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Evidential value	The asset has some evidential value, relating to the construction and design techniques associated with original fabric – although subsequent repairs may have affected this to a degree
Historical value	As part of the Cranfleet Canal, the asset has considerable historical value, illustrating the development of England's canal network in parallel with industrial and urban growth
Aesthetic value	Associated with Grade II listed lockkeeper's cottage, forming a legible and attractive group
Communal value	Publicly accessible functioning lock; canal is likely to be a highly valued resource for recreation – including boating
Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Description	Cast iron canal milepost. 1819, produced by Rangeley and Dixon and erected as part of the Trent and Mersey Canal
Status	Listed Building, Grade II (NHLE: 1205708)
Importance	High – regional importance
Condition	Unknown
Evidential value	Erected as part of a series of mileposts on the Trent and Mersey Canal, the asset has some evidential value in terms of the casting process for contemporary ironwork
Historical value	The milepost has illustrative value in terms of its role in forming part of the canal system. Its association with the process of canal construction and the wider economic, technological and social forces that shaped late 18th and 19th century England contributes the majority of its interest. In addition, its clear link to a local foundry adds interest. Cast iron mile markers are a comparatively rare survival, having often been either reclaimed for scrap or removed to confound potential German invaders during WW2
Aesthetic value	Cast iron. Circular stem with shallow segmental curved plate near top and moulded circular head. The stem has a raised quatrefoil near the base inscribed 'R and D.Stone 1819' and the plate has two panels, that to east inscribed 'SHARDLOW 1 MILE' and that to west inscribed 'PRESTON BROOK 91 MILES'. The asset has some aesthetic value as a simple, functional and elegant object
Communal value	Erected as part of a series of mileposts on the Trent and Mersey Canal, the asset has some communal value as part of the wider canal network – which is likely to be highly valued as a recreational asset

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Pump House, Elvaston Country Park	
Description	Pump house. Early C19, built for the Earl of Harrington and probably designed by William Barron, with later alterations. Red brick on stone plinth with stone dressings. Red tile roof with strange parapets to side walls which curve in at eaves level and curve out again to top, plus flush parapets to gable walls with curved top rising to a central point. Both side and gable wall parapets have been slightly lowered and capped with engineering bricks. Single storey and single bay with waterwheel to east side. South elevation has chamfered trefoil headed doorcase with plank door and cinquefoil headed niche over, with a large 'H' topped by a coronet, within. North and west elevations have cinquefoil headed single light chamfered windows. East side has a cast iron waterwheel with wooden paddles and wooden rim. This is surrounded by a C20 brick wall with iron railings to top. The original pump is still housed inside the building. This was probably the first of a series of similar buildings erected during the creation of the lavish gardens designed by William Barron from 1830-1860, which are included in the Derbyshire Historic Gardens Register at Grade II*. In his diary William Barron records that work on the lake and on the water supplies were among his first project
Status	Listed Building, Grade II (NHLE: 1096399)
Importance	High – regional importance
Condition	Poor
Evidential value	The asset is likely to have some evidential value in terms of building archaeology
Historical value	The asset has illustrative value as a fine example of a 19th century pump house. Its association with the Earls of Harrington, and designer William Barron, provide associative value
Aesthetic value	The building has some aesthetic value
Communal value	Located in a country park open to public access for recreation with 321 acres of open parkland, woodland and more formal historical gardens
Darley Abbey Weir	
Description	The weir, constructed in c1782, is situated in the River Derwent, to the immediate west of the former Boars Head Mills, listed at Grade I. The weir complex measures approximately 110m in length, and comprises a two-part weir structure constructed of coursed square gritstone blocks. The C21 footbridge following the line of the weir south of the island and the timber post and rail fence which sits above the revetment wall around the island are not considered to be of historic or architectural interest
Status	Listed Building, Grade II, within the Derwent Valley Mills World Heritage Site (NHLE: 1420572)
Importance	Individually, of regional importance; collectively as part of WHS, internationally important
Condition	Fair
Evidential value	The asset has some evidential value in terms of the construction techniques applied in its structure

Table 3-3: Historic environment benefits provided by each heritage asset identified in the study area	
Historical value	The industrial roots of Darley Abbey date back to the monastic period, when it was an industrial hamlet, with fulling mills, corn mills, and a forge. By the early 1770s, Darley Abbey held five water-powered mills, including a paper mill, a corn mill, two flint mills (for porcelain production) and a leather mill, all on the west bank of the River Derwent. The Evans family were established industrialists and bankers, and Alderman Evans held industrial interests in Darley Abbey since at least 1746 when he acquired a fulling mill and dye house. It was not until the 1770s that his son-in-law Thomas Evans and his brother the Reverend Edmund Evans began the purchase of land holding at Darley Abbey, developing the Evans industrial estate. Thomas Evans was an associate of Richard Arkwright, who had successfully developed a machine for spinning cotton in the 1760s, and had built a large industrial milling complex north of Darley Abbey in the Derwent Valley at Cromford in the 1770s. The Evans family was also related by marriage to the Strutt family who had textile mills nearby in Belper, Milford and Derby. The land east of the River Derwent at Darley Abbey was acquired by Thomas Evans in 1778, and Richard Arkwright persuaded Evans to build and operate a cotton mill using Arkwright's patented machinery. Evans developed the Darley Abbey site as 'Boar's Head Mills' between 1782 and 1830, the name is derived from the Evans family crest. By 1789, the Derwent Valley had the largest concentration of mills working on the Arkwright principle in Britain. The weir was constructed in c1782, as well as a masonry bridge linking the village on the west bank with the new mills on the east bank of the river. The masonry bridge was replaced in the mid C19 by a bridge built on cast-iron columns, and this superstructure was replaced by concrete in the 1930s. The weir was constructed diagonally across the river Derwent to regulate the flow of water to the Boars Head Mills, and control the direction of its flow downstream. In order to obtain the adequate volume of water, the river was dredged from Allestree Ford, providing the Evans with a high quality sediment by-product to sell as a building material and to Derby Corporation for sanding tram lines in bad weather. Two sluice gates helped provide a consistent flow of water, being opened and closed according to the abundance or scarcity of the water supply. Photos reproduced in Don Peters' Darley Abbey (1974) show two C19 metal gates on a winding mechanism, and these have since been replaced. From the pool created by the weir, water was channelled through the wheelhouse, turning the waterwheel and thereby driving the machinery
Aesthetic value	The weir has some aesthetic value in contributing to the character of the river corridor
Communal value	The asset is likely to have some communal value, as the Derwent Valley Mills are an important part of local history and cultural heritage
Source: Historic England, National Heritage List for England (NHLE) accessed at: https://historicengland.org.uk/listing/the-list/ on 7th June 2018. *Further information on references for specific assets is provided as part of Annex 2* *Note: critical appraisal of the datasets / detailed literature review is not within the scope of this study*	

3.3.2 Linking heritage assets to the natural environment

Approach to linking individual assets to the natural environment

Once the heritage assets have been identified and their benefits described in terms of evidential, historical, aesthetic and communal value, consideration is given to how the heritage assets link with the natural environment. Heritage assets may be associated with particular natural capital stocks through the way that land is used or managed and, hence, the habitats that are associated with the heritage assets. This part of the assessment identifies which habitats or land uses are associated with each of the historic environment assets, in order to better understand how the historic and natural environments interact to deliver more and wider benefits. Internet mapping applications (with aerial photography) were used to identify type of land use at or around each heritage asset. Table 3-4 identifies the habitats and land uses believed to be associated with each heritage asset. These are also recorded within the heritage asset inventory in Annex 2.

Table 3-4: Land uses/habitats associated with each heritage asset

Asset name	Habitat/land use
Ridge and furrow, between Sudbury and the Dove	Arable land (ploughed)
St Mary's Church (formerly St John's), Marston	Cemetery managed grassland, ivy covered wall
Coalbrookdale footbridge, Egginton	Arable land
Twyford henge and Round Hill bowl barrow	Grassland amongst arable (ploughed). Animal burrowing suggests asset used as habitat
Anchor church, Ingleby	Natural cave surrounded by broadleaved woodland
Swarkestone Old Hall and garden	Gardens. The gardens associated with Swarkestone Old Hall fall into two areas, the former gardens enclosed by walls attached to the ruins of the Old Hall (listed grade II*), and a pavilion or banqueting house called The Grandstand and its attached walls (listed grade I), which lies c 170m north of the Old Hall.
Swarkestone Lowes barrow cemetery and field system	Arable land
Weston Hall and homestead moat	Built up areas and gardens
Cursus complex, Aston upon Trent	Arable land
Cropmark complex, Hicken's Bridge, Aston upon Trent	Standing water; broadleaved woodland
Swarkestone bridge and causeway to Stanton-by-Bridge	Arable land; built up area
Prehistoric landscape, Frizams Lane, Twyford and Stenson	Arable land; boundary and linear features
Elvaston Castle and gardens	Gardens
Nottingham Road Cemetery	Managed grassland cemetery; boundary and linear features
Derby Racecourse Roman vicus and cemetery	Improved grassland
Springfield Mill Factory and Chimney	Built up area

Table 3-4: Land uses/habitats associated with each heritage asset	
Asset name	**Habitat/land use**
Cranfleet Lock	Standing water and canal
Canal Milepost	Standing water and canal; broadleaved woodland
Pump House, Elvaston Country Park	Standing water; broadleaved woodland
Darley Abbey Weir	River; broadleaved woodland; fish pass installed in 2015 to provide free upstream and downstream passage for all species of fish at Darley Abbey weir including eel. This will contribute significantly to the waterbody target of Achieving good ecological potential by 2027
Note: a full description of each heritage asset can be found in Table 3-3	

Linking assets at the landscape scale

The Trent Valley landscape presents an ideal opportunity to explore interactions between the historic and natural environments, since its flat, open characteristics are strongly defined by the river Trent, periodic inundation and the valley's archaeological and industrial heritage. Previous work undertaken by Trent Valley GeoArchaeology to map palaeochannels of the Trent Valley[18] has demonstrated the importance of the river and its changing landforms in understanding and interpreting evolving practical and symbolic landscape use through time. Furthermore, ArcHeritage note that the Trent Valley's rivers not only provide a connection between historic sites, but may act as a focus for heritage interpretation across the study area as a whole[19].

Historic England's Strategy for Water and Wetland Heritage acknowledges the need to consider heritage assets in their broader landscape and hydrological setting, rather than on a single site basis; however, a wider appreciation of wetlands as historic landscapes themselves, shaped by human agency and past land use practices, is lacking amongst stakeholders and policy-makers[20]. Therefore, alongside the exploration and valuation of individual heritage assets, this study will attempt to consider the broader definition of the Trent Valley's wetland landscape as a heritage asset itself, and how the benefits delivered could be captured at this scale.

3.4 Issues encountered during the task

The case studies are intended to enable learning and knowledge sharing, thus this section records the various issues encountered during the task. Table 3-5 provides a list of issues with implications and the solutions/work arounds employed to deal with them. It is important to note that the available data set included over 500 records, so not all of these assets were taken forwards. This

[18] Baker, S., 2006, The palaeochannel record in the Trent Valley UK: contributions towards cultural heritage management, Internet Archaeology 20 accessed at https://doi.org/10.11141/ia.20.3 on 17th May 2018.

[19] ArcHeritage (2017): Transforming the Trent Valley: Cultural heritage audit report, p.60 available at: https://www.staffordshire.gov.uk/environment/eLand/planners-developers/HistoricEnvironment/Projects/TTTV-CHA-v2-3-full-protected-version.pdf on 17th May 2018.

[20] Heathcote, J., 2012, Strategy for Water and Wetland Heritage, Historic England accessed at https://content.historicengland.org.uk/content/docs/research/strategy-water-wetland-heritage.pdf on 17th May 2018.

meant that only part of the heritage record was considered. This limitation is minimised through consideration of the broader definition of the Trent Valley's wetland landscape as a heritage asset in itself, in order to capture the value of related assets as part of a wider landscape setting.

Table 3-5: Issues encountered during Task 2		
Issue	**Implications**	**Solution/work around**
Data availability – some of the reports identified provide summary data rather than the full dataset used	Only some of the data can be used (other heritage asset data cannot be matched to the study area since no location information is provided)	Contact the individuals responsible for the reports to see if the disaggregated data can be made available
Need to identify the location of heritage assets to minimise the number of assumptions needed when making linkages to the natural environment	Time and level of information needed to assess each asset is increased over and above that required to describe the historic aspects of the asset	Efforts prioritised so that time is spent on those heritage assets most closely linked to the 'water meadows and water management theme' rather than all assets
Matching up different datasets – the study area, which follows a contour around the river, does not necessarily match with other available datasets listing heritage assets	Whilst the HER data have been extracted using GIS so can be matched the study area, other data sources (e.g. reports including maps) do not follow the same boundary so a judgement has to be made in each case as to whether a heritage asset/feature should be included or not. This means that some assets identified may actually be outside of the study area, whilst others that are excluded should actually be taken into consideration	Most of the heritage asset data do come from the GIS files thus are relevant to the study area. Where there is uncertainty about a particular asset, it is included where it is only one of its type (to ensure that type of asset is taken through the framework). If there is uncertainty over whether an asset should be considered but there are already several of that asset type included, it is generally excluded since its inclusion would not add to the method/approach
Lack of access to GIS land cover data. It was thought that GIS land cover data (specifically the CEH land cover map) could be used to identify the habitats in which the heritage assets were situated. This would enable consistent habitat classification. Whilst these data are believed to be available to the Defra family, they could only be obtained by the consultants for a fee (thus were not affordable within the study budget)	The task of determining the habitat in which each heritage asset is located becomes a bit more subjective since it is dependent on one individual's interpretation of an aerial photograph of the area. There may be some consistency issues in terms of the habitat types allocated (starting with the land cover data would have provided a set list of habitat categories)	Freely available internet mapping applications with aerial photography are used to assign heritage assets to habitat types
Complexity of data set. Data include multiple assets under the same National Heritage List for England *(*NHLE) reference number, requiring judgement as to whether the assets should be taken individually or together	The task of identifying individual heritage assets becomes a bit more subjective since it is dependent on one individual's interpretation of when an asset is discrete or part of a group	Each NHLE number was considered as a single asset and therefore listed once only to avoid double counting

Table 3-5: Issues encountered during Task 2		
Issue	**Implications**	**Solution/work around**
Available data set includes assets not taken forwards – the data set includes over 500 records and for the purposes of this study just a single example of each type of asset was used (e.g. x1 ridge and furrow record, x1 bowl barrow)	Only part of the heritage record was considered	Considering the broader definition of the Trent Valley's wetland landscape as a heritage asset in itself should enable the wider benefits delivered by both the natural and historic environment to be fully captured
The heritage data used require expert critical assessment to screen for errors and debateable interpretations	Critical appraisal is not within the scope of this study, meaning that some data interpretations may not be accurate (particularly given that this is a desk based study with no ground-truthing carried out)	Up to date HER/NHLE data will be used to ensure recent work is considered

4 Current influence of the historic environment

4.1 Overview

This section considers the current influence of the historic environment. Using the land uses and habitats identified as being associated with the various heritage assets, it indicates the ecosystem services that may be provided by the assets. Comparisons are drawn with the way in which heritage was captured by ecosystem services in the previous assessment. As for the previous task, issues encountered along with solutions/work arounds are also recorded.

4.2 Determining the influence of the historic environment

The influence of the historic environment in terms of how it could affect the benefits captured through natural capital accounting can be assessed based on how the heritage assets influence each of the following four aspects:

- **Extent of natural capital stocks**: heritage assets may be associated with natural capital stocks through the way that land is used or managed and, hence, the habitats that are associated with the heritage assets. This part of the assessment identifies which habitats or land uses are associated with each of the heritage assets.

- **Impact on condition of natural capital stocks**: the presence of the heritage asset may mean it has been managed in a particular way with that having an influence on the condition of the habitats or land uses. This part of the assessment enables the influence that the heritage asset has had on the condition of the habitat or land use to be recorded. As a result, it effectively sets what proportion of the benefits flowing from the natural capital stock can be attributed to the heritage assets.

- **Impacts on the flow of services from natural capital stocks**: the type of habitat or land use and its condition will determine which services flow from the stocks and, hence, which benefits are likely to be delivered. This part of the assessment enables the benefits delivered by the natural capital stocks to be related to the heritage assets by linking the flow of benefits to the influence that the assets have had on the extent of stock and their condition.

- **Premium on benefits**: some of the benefits delivered by the natural environment may have a premium associated with them due to the presence of heritage assets. Premiums may be associated with goods that are provided by ecosystem services due their association with a specific asset or the identity of an area, and by benefits provided by cultural services where the historic element may be more directly associated with the benefit being valued.

The influence of each heritage asset can be considered against these four aspects to enable the link between the historic environment and the natural environment to be described. This can then be used as the basis for identifying, quantifying and valuing the benefits using natural capital accounting approaches.

Section 3 made initial linkages between the heritage assets and different land uses/habitats i.e. the natural capital stock (see Section 3.3.2 above). Section 4 takes this a bit further and identifies the

ecosystem services likely to be associated with each asset due to the land use/habitat in which it is situated.

4.3 Linking heritage assets to ecosystem services

The previous assessment of the Trent Valley captured heritage value in terms of cultural ecosystem services. The present study builds on this approach by considering additional ecosystem services, as well as the impact of heritage assets on the flow of these services.

Heritage assets may be associated with particular natural capital stocks through the way that land is used or managed and, hence, the habitats that are associated with the heritage assets. In particular, the presence of a heritage asset may mean the land has been managed in a particular way, with that having an influence on the condition of the habitats or land uses and consequently the services and benefits provided. The method used here enables the influence that the heritage asset has had on the condition of the habitat or land use to be recorded. As a result, it attempts to identify the proportion of the benefits flowing from the natural capital stock that can be attributed to the heritage assets.

Table 4-1 shows the services thought to be provided by the natural capital stock linked to each heritage asset. It also identifies where the heritage asset itself is thought to impact the flow of services from the natural capital stock. This comparison indicates that the range of ecosystem services that heritage assets affect is wider than previously considered and includes:

- Biodiversity;
- Climate regulation (emissions and sequestration of GHGs);
- Educational value;
- Cultural heritage;
- Aesthetics;
- Recreation and tourism and;
- Wellbeing.

Since the influence of the historic environment therefore reaches beyond cultural services, this means that Task 4, which aims to identify the values provided by the historic environment, should attempt to describe, quantify and monetise (where possible) this wider range of benefits.

Table 4-1: Impact of heritage assets on natural capital and flow of services

Asset name	Services likely to flow from each heritage asset (based on land use/habitat)	Services influenced by heritage nature of the asset
Ridge and furrow, between Sudbury and the Dove	Biodiversity Livestock and crop production Climate regulation (emissions and sequestration of GHGs)* Cultural heritage Aesthetics	Cultural heritage Aesthetics
St Mary's Church (formerly St John's), Marston	Biodiversity Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Biodiversity Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing

Table 4-1: Impact of heritage assets on natural capital and flow of services		
Asset name	**Services likely to flow from each heritage asset (based on land use/habitat)**	**Services influenced by heritage nature of the asset**
Coalbrookdale footbridge, Egginton	Biodiversity Livestock and crop production Climate regulation (emissions and sequestration of GHGs) Cultural heritage Aesthetics Recreation and tourism	Cultural heritage Aesthetics Recreation and tourism
Twyford henge and Round Hill bowl barrow	Biodiversity Livestock and crop production Climate regulation (emissions and sequestration of GHGs)* Cultural heritage Aesthetics	Cultural heritage Aesthetics
Anchor church, Ingleby	Biodiversity Air quality regulation Climate regulation (emissions and sequestration of GHGs) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing
Swarkestone Old Hall and garden	Biodiversity Air quality regulation Climate regulation (emissions and sequestration of GHGs) Cultural heritage Aesthetics Wellbeing	Biodiversity Cultural heritage Aesthetics Wellbeing
Swarkestone Lowes barrow cemetery and field system	Biodiversity Livestock and crop production Climate regulation (emissions and sequestration of GHGs)* Cultural heritage Aesthetics	Cultural heritage Aesthetics
Weston Hall and homestead moat	Biodiversity Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing
Cursus complex, Aston upon Trent	Biodiversity Livestock and crop production Climate regulation (emissions and sequestration of GHGs) Cultural heritage Aesthetics	Cultural heritage Aesthetics

Table 4-1: Impact of heritage assets on natural capital and flow of services		
Asset name	**Services likely to flow from each heritage asset (based on land use/habitat)**	**Services influenced by heritage nature of the asset**
Cropmark complex, Hicken's Bridge, Aston upon Trent	Biodiversity Crop production Provision of freshwater (and availability of freshwater) Air quality regulation Climate regulation (emissions and sequestration of GHGs) Water purification Cultural heritage Aesthetics	Cultural heritage Aesthetics
Swarkestone bridge and causeway to Stanton-by-Bridge	Biodiversity Livestock and crop production Climate regulation (emissions and sequestration of GHGs) Cultural heritage Aesthetics Recreation and tourism	Cultural heritage Aesthetics Recreation and tourism
Prehistoric landscape, Frizams Lane, Twyford and Stenson	Biodiversity Livestock and crop production Climate regulation (emissions and sequestration of GHGs)* Cultural heritage Aesthetics	Cultural heritage Aesthetics
Elvaston Castle and gardens	Biodiversity Climate regulation (emissions and sequestration of GHGs) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Biodiversity Climate regulation (emissions and sequestration of GHGs) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing
Nottingham Road Cemetery	Biodiversity Climate regulation (emissions and sequestration of GHGs) Cultural heritage Aesthetics Recreation and tourism Wellbeing	Biodiversity Climate regulation (emissions and sequestration of GHGs) Cultural heritage Aesthetics Recreation and tourism Wellbeing
Derby Racecourse Roman vicus and cemetery	Biodiversity Climate regulation (emissions and sequestration of GHGs) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing

Table 4-1: Impact of heritage assets on natural capital and flow of services		
Asset name	**Services likely to flow from each heritage asset (based on land use/habitat)**	**Services influenced by heritage nature of the asset**
Springfield Mill Factory and Chimney	Educational value Cultural heritage Aesthetics Recreation and tourism	Educational value Cultural heritage Aesthetics Recreation and tourism
Cranfleet Lock	Biodiversity Provision of freshwater (and availability of freshwater) Water regulation (large-scale) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing
Canal Milepost	Biodiversity Provision of freshwater (and availability of freshwater) Air quality regulation Climate regulation (emissions and sequestration of GHGs) Water purification Water regulation (large-scale) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing
Pump House, Elvaston Country Park	Biodiversity Provision of freshwater (and availability of freshwater) Air quality regulation Climate regulation (emissions and sequestration of GHGs) Water purification Water regulation (large-scale) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing

Table 4-1: Impact of heritage assets on natural capital and flow of services		
Asset name	**Services likely to flow from each heritage asset (based on land use/habitat)**	**Services influenced by heritage nature of the asset**
Darley Abbey Weir	Biodiversity Provision of freshwater (and availability of freshwater) Air quality regulation Climate regulation (emissions and sequestration of GHGs) Water purification Water regulation (large-scale) Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing	Educational value Cultural heritage Aesthetics Recreation and tourism Wellbeing
Notes: *This assessment is based on the identification of the land use/habitats associated with each asset from internet mapping applications. Actual land uses/habitats on the ground may be slightly different.* **although climate regulation can flow from this type of land use, due to the poor condition of the asset/habitat in these cases, it is assumed that there is little benefit in terms of carbon storage.* *A full description of each heritage asset can be found in Table 3-3*		

4.4 Issues encountered during the task

Table 4-2 (overleaf) provides a summary of issues encountered during this task as well as their implications.

Table 4-2: Issues encountered during Task 3		
Issue	**Implications**	**Solution/work around**
Subjectivity of ecosystem service allocation to specific land uses/habitats (natural capital stocks)	The task of allocating ecosystem services to habitats is dependent on one individual's interpretation	Certain assumptions were made when identifying linkages to try and ensure consistency when allocating services to habitats (and hence to assets)
Allocation of ecosystem services to the "historic nature" of the asset	Each asset has a list of ecosystem services associated with it. Some of these services are thought to be directly associated with (or influenced by) the historic nature of the asset. For example, the cultural heritage provided by Darley Abbey Weir is assumed to be due to the heritage asset itself rather than the land use/habitat with which it has been associated. However, the process of allocating services to the historic nature of the asset is subjective and is dependent on the information available on the asset and the judgement of the individual carrying out the assessment	This is more of an issue to be aware of, rather than something that needs a particular solution. The nature of heritage and the individuality of each asset means that the allocation of services would likely vary even between assets of a similar type
Lack of information on how condition of assets (and hence flow of services) may be changing over time. The dataset used does not provide information on drivers for change/pressures affecting the assets (other than in anecdotal comments about condition)	The assessment is only able to provide a "snapshot" of the services likely to be flowing from the assets at the current point in time	For this study, the assessment of services provided and the subset of services attributed to heritage are based on the current condition of the heritage asset (and the habitat/land use associated with it)

5 Identifying the values provided by the heritage assets

5.1 Overview

This section draws on the list of heritage assets and ecosystem services from Section 4 to identify approaches that could potentially be used to describe, quantify and monetise (where possible) the benefits of the heritage assets. It presents an inventory of the benefits that flow from heritage assets, identifying where these are linked to ecosystem services and where they may fall outside the ecosystem services framework.

5.2 Approaches that could be used to describe, quantify and monetise the benefits

To identify approaches that could be used to describe, quantify and monetise the benefits from heritage assets, the study drew on a database of values previously identified by RPA as part of work for the Environment Agency on integrated planning[21]. The database functions as a benefits inventory, bringing together 506 discrete valuation studies that provide an indicative value for a particular benefit (e.g. value of a specific change in river quality for informal recreation). The first step in the process involved matching the habitats/land uses associated with the heritage assets (see Figure 5-1) to the types of benefit in the inventory. This enabled the identification of relevant references and hence benefit values for each habitat/land use.

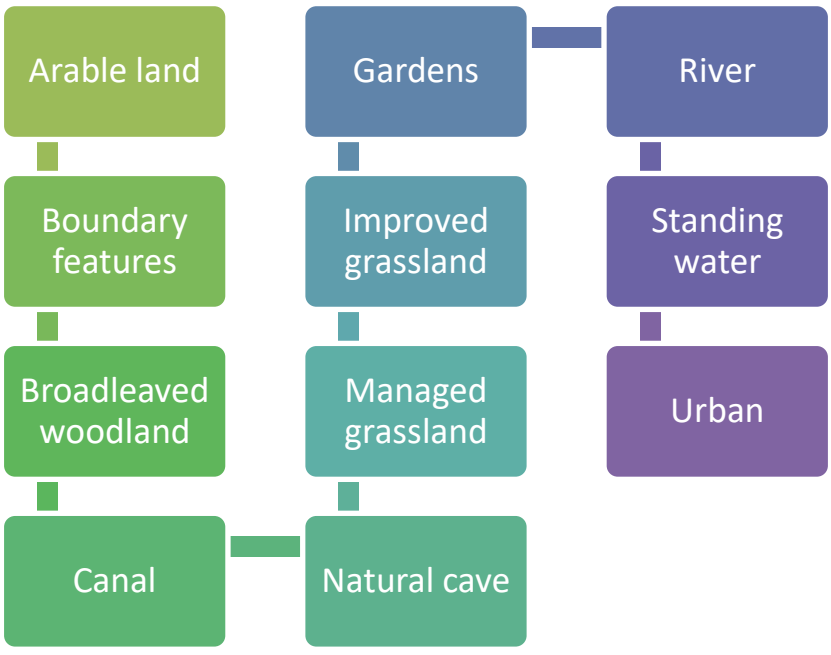

Figure 5-1: Habitats and land uses associated with heritage assets in the Trent Valley

[21] RPA (2017): Integrated planning and natural capital economic appraisal, methodology report submitted to the Environment Agency in April 2017. Note that the database was produced as a supporting output.

Following this matching exercise, the references in each worksheet were assessed to determine their relevance. This assessment was a two stage process, with each reference being assessed to see:

- Whether the specific change (benefit) being valued by the reference is relevant to the heritage asset being considered (e.g. ridge and furrow) and associated land use (e.g. arable); and
- Whether the ecosystem services covered by the reference and its benefit value match the services provided by the heritage asset and are influenced by the heritage nature of the asset.

An example is provided in the following tables for St Mary's Church.

Table 5-1: Summary details for St Mary's Church

Heritage asset	Associated habitat/ land use	Services likely to be provided
St Mary's Church (formerly St John's), Marston	Cemetery managed grassland, ivy covered wall	Biodiversity - YES Educational value - YES Cultural heritage - YES Aesthetics - YES Recreation and tourism - YES Wellbeing - YES
Notes: Yes/no in the services provided column refers to whether the provision of a service is influenced by the heritage nature of the asset		

Table 5-2: First rating: is the benefit being valued by the reference relevant to the heritage asset and its land use?

Unique reference	Benefit (high level)	Benefit (medium level)	Benefit (low level)	Change being valued	Rating of change
2	Food	Agriculture	Value of livestock	Value per head of livestock	Insufficient: match is not sufficient enough to enable value to be used

Table 5-3: Second rating: do the services covered by the reference match those provided by the heritage asset?

Services captured by reference	Rating of change
Food, fibre & fuel	Insufficient: match is not sufficient enough to enable value to be used

The boxes indicate that the reference is rated as insufficient on two accounts:

- The benefit being assessed is not relevant to the asset and its land use (value of livestock is assumed not to be a relevant benefit for a churchyard); and
- The services covered by the reference (food, fibre and fuel) do not sufficiently match the services likely to be provided by the heritage asset (shown in Table 5-1).

An overall assessment of whether a value is appropriate or not is made on the following basis:

- Two insufficient ratings: value is not appropriate;

- Two sufficient ratings: value is appropriate; and
- Any uncertain rating: use of value is uncertain.

Based on the two insufficient ratings, reference 2 is therefore rated as not appropriate for determining the benefits from St Mary's Church.

Following this process for all 20 heritage assets resulted in the identification of a list of references (with benefit values) that are considered appropriate for the assets and the services they provide.

5.3 Inventory of benefits from heritage assets

The spreadsheet developed as part of the assessment process followed in Section 5.2 provides the inventory of benefits from the heritage assets. The spreadsheet is included as Annex 3 with a summary is presented in Table 5-4 below.

Table 5-4: Summary table showing number of references identified as appropriate and types of benefits valued by these references

Heritage asset	Number of references assessed as being:			Types of benefits valued by references assessed as appropriate
	Appropriate	Inappropriate	Uncertain	
Ridge and furrow, between Sudbury and the Dove	5	51	5	Sense of place Non-charismatic species Aesthetics (property prices) Cultural heritage
St Mary's Church (formerly St John's), Marston	19	45	21	Sense of place Non-charismatic species Aesthetics (avoiding presence of litter/dog mess) Recreation (land) Benefits from biodiversity Activity (walking/cycling) Cultural heritage
Coalbrookdale footbridge, Egginton	16	40	5	Sense of place Non-charismatic species Aesthetics (avoiding presence of litter/dog mess) Recreation (land) Activity (walking/cycling) Aesthetics (property prices) Cultural heritage
Twyford henge and Round Hill bowl barrow	5	60	20	Sense of place Recreation (land) Aesthetics (property prices) Cultural heritage
Anchor church, Ingleby	23	38	7	Sense of place Aesthetics (avoiding presence of litter/dog mess) Recreation (land) Activity (walking/cycling/horse riding) Aesthetics (property prices)

Table 5-4: Summary table showing number of references identified as appropriate and types of benefits valued by these references				
Heritage asset	Number of references assessed as being:			Types of benefits valued by references assessed as appropriate
	Appropriate	Inappropriate	Uncertain	
Swarkestone Old Hall and garden	14	54	0	Sense of place Non-charismatic species Aesthetics (avoiding presence of litter/dog mess) Benefits from biodiversity Aesthetics (property prices)
Swarkestone Lowes barrow cemetery and field system	5	51	5	Sense of place Aesthetics (avoiding presence of litter/dog mess) Aesthetics (property prices) Cultural heritage
Weston Hall and homestead moat	36	115	1	Groundwater scheme (property) Sense of place Aesthetics (avoiding presence of litter/dog mess) Aesthetics (property prices) Recreation (land) Activity (walking/cycling) Cultural heritage Aesthetics (local ponds)
Cursus complex, Aston upon Trent	5	51	5	Sense of place Aesthetics (avoiding presence of litter/dog mess) Aesthetics (property prices) Cultural heritage
Cropmark complex, Hicken's Bridge, Aston upon Trent	12	120	27	Aesthetics (property prices) Recreation (land) Sense of place Aesthetics (avoiding presence of litter/dog mess) Aesthetics (local ponds)
Swarkestone bridge and causeway to Stanton-by-Bridge	22	131	5	Groundwater scheme (property) Aesthetics (property prices/street greening/local ponds/avoiding presence of litter/dog mess) Recreation (land) Sense of place Walking/cycling/horse riding Recreation (water)
Prehistoric landscape, Frizams Lane, Twyford and Stenson	2	73	7	Sense of place

Table 5-4: Summary table showing number of references identified as appropriate and types of benefits valued by these references				
Heritage asset	Number of references assessed as being:			Types of benefits valued by references assessed as appropriate
	Appropriate	Inappropriate	Uncertain	
Elvaston Castle and gardens	32	36	0	Sense of place Non-charismatic species Climate regulation (through carbon sequestration) Aesthetics (avoiding presence of litter/dog mess) Benefits from biodiversity Walking/cycling Recreation (land) Aesthetics (property prices)
Nottingham Road Cemetery	26	56	25	Recreation (land) Climate regulation (through carbon sequestration) Sense of place Charismatic species Non-charismatic species Aesthetics (avoiding presence of litter/dog mess) Benefits from biodiversity Walking/cycling Aesthetics (property prices)
Derby Racecourse Roman vicus and cemetery	15	47	21	Sense of place Recreation (land) Walking/cycling/horse riding Aesthetics (property prices) Cultural heritage
Springfield Mill Factory and Chimney	18	113	0	Sense of place Aesthetics (avoiding presence of litter/dog mess) Aesthetics (property prices) Recreation (land) Walking/cycling Cultural heritage
Cranfleet Lock	69	56	31	Angling Sense of place Recreation (water) Aesthetics (avoiding presence of litter/dog mess) Walking/cycling Cultural values Aesthetics (property prices) Freshwater

Table 5-4: Summary table showing number of references identified as appropriate and types of benefits valued by these references				
Heritage asset	Number of references assessed as being:			Types of benefits valued by references assessed as appropriate
	Appropriate	Inappropriate	Uncertain	
Canal Milepost	53	137	2	Angling Sense of place Recreation (water) Aesthetics (avoiding presence of litter/dog mess) Walking/cycling Recreation (land) Cultural values
Pump House, Elvaston Country Park	59	69	31	Sense of place Aesthetics (avoiding presence of litter/dog mess) Walking/cycling/horse riding Recreation (land) Angling Recreation (water)
Darley Abbey Weir	97	89	22	Angling Recreation (water) Freshwater Aesthetics (property prices) Sense of place Aesthetics (avoiding presence of litter/dog mess) Walking/cycling/horse riding Recreation (water)
Note: some similar types of benefit are valued in multiple studies and at varying levels of detail. For brevity, these have been summarised so that the most appropriate types of benefits are included in this table. For valuation purposes the full list will be taken forward. A full description of each heritage asset can be found in Table 3-3				

5.4 Reflection on the benefits identified in the inventory

The previous Trent Valley assessment used a number of approaches to enable the benefits from the natural environment to be quantified and monetised (see Table 3-1). Table 5-5 shows where the heritage benefits identified from the inventory align with the ecosystem services considered in the previous assessment. Table 5-5 uses a colour-coding system where:

- Green indicates a good match;
- Orange indicates a partial match; and
- Red indicates no match.

For example, the heritage benefit "benefits from biodiversity" identified from the inventory is considered a good match to the service "biodiversity (including habitats and species)" as assessed in the previous Trent Valley study. In contrast, the heritage benefit "aesthetics (property prices)" from the inventory was not considered to match any of the services assessed previously.

Table 5-5: Assessment of appropriate benefits to determine whether they match the ecosystem services considered in the previous assessment			
Heritage benefit from inventory	**Relevant service from previous assessment**	**Extent of match with service considered in previous assessment**	**Comments on match**
Benefits from biodiversity	Biodiversity (including habitats and species)	Good match	Approach used in previous assessment considered appropriate to apply here
Charismatic species	Biodiversity (including habitats and species)	Partial match	Could be captured in Biodiversity (including habitats and species), however charismatic species is likely to be a more detailed subset of biodiversity and as such this may result in under/over estimation of benefits
Non-charismatic species	Biodiversity (including habitats and species)	Partial match	Could be captured in Biodiversity (including habitats and species), however non-charismatic species is likely to be a more detailed subset of biodiversity and as such this may result in under/over estimation of benefits
Aesthetics (property prices)	No match	No match	Aesthetics in terms of property prices were not captured in the previous assessment. Use of this value may help capture additional benefits
Cultural heritage	Heritage value	Good match	Different terminology however approach used in previous assessment considered appropriate to apply here
Angling	Recreational value	Partial match	Could be captured under Recreational value, however for a site where there is a large proportion of angling it is more appropriate to use a specific angling value to avoid under/over estimation of benefits
Aesthetics (avoiding presence of litter / dog mess)	No match	No match	Aesthetics were not captured in the previous assessment. Use of this value may help capture additional benefits
Recreation (land)	Recreational value	Partial match	Could be captured under Recreational value, however it may be more appropriate to look at a more detailed subset of values more relevant to the site in question
Activity (walking/cycling)	Recreational value	Partial match	Could be captured under Recreational value, however it may be more appropriate to use a specific walking or cycling value to avoid under/over estimation of benefits

Table 5-5: Assessment of appropriate benefits to determine whether they match the ecosystem services considered in the previous assessment			
Heritage benefit from inventory	**Relevant service from previous assessment**	**Extent of match with service considered in previous assessment**	**Comments on match**
Activity (horse riding)	Recreational value	Partial match	Could be captured under Recreational value, however it may be more appropriate to use a specific horse riding value to avoid under/over estimation of benefits
Groundwater scheme (property)	No match	No match	Aesthetics in terms of property premiums were not captured in the previous assessment. Use of this value may help capture additional benefits
Aesthetics (local ponds)	No match	No match	Aesthetics were not captured in the previous assessment. Use of this value may help capture additional benefits
Aesthetics (street greening)	No match	No match	Aesthetics in terms of street greening were not captured in the previous assessment. Use of this value may help capture additional benefits
Recreation (water)	Recreational value	Partial match	Could be captured under Recreational value, however for a site where there is a large proportion of water-based recreational activities it is more appropriate to use a specific water values to avoid under/over estimation of benefits
Climate regulation (through carbon sequestration)	Carbon sequestration	Good match	Approach used in previous assessment considered appropriate to apply here
Freshwater	Provision of drinking water	Good match	Approach used in previous assessment considered appropriate to apply here
Sense of place	Wellbeing, health and happiness	Partial match	Could be captured under Wellbeing, health and happiness, however the extent to which heritage sites, sense of identity and green sites associated with heritage assets could affect life satisfaction may not be captured sufficiently

Table 5-5 shows that four of the 16 types of benefit identified in the inventory align with the ecosystem services considered in the previous assessment. These include benefits from:

- Biodiversity;

- Cultural heritage;
- Climate regulation; and
- Freshwater.

This alignment suggests that the values used to quantify the benefits were appropriate, meaning the benefits were adequately captured within the ecosystem services based approach used in the previous Trent Valley assessment.

The remaining benefits either only partially match or were not considered in the previous study. These benefits may still be assessed within an ecosystem services framework, although changes are needed to enable their value to be fully captured. The majority of the partially-matched benefits could be described as 'sub-sets' of categories considered previously, e.g. angling is a subset of recreation. This suggests that the benefits provided by heritage assets can be disaggregated in more detail than was considered previously. Indeed, if a broad set of benefits is used to assess a heritage asset, a large number of benefits may not be adequately captured. For example, although angling could be captured under the broader value of recreation, for a site where there is a large proportion of angling, this may result in the angling benefits being unaccounted for. In this instance, using a more detailed set of values that are specific to angling is appropriate to avoid the possibility of under- or overestimation of benefits.

Specific benefits relating to aesthetics (property prices, avoiding presence of litter/dog mess, groundwater scheme, local ponds and street greening) fall outside of the ecosystem services framework and therefore do not align with the categories assessed in the previous assessment.

Overall, this exercise indicates that values linked to heritage assets have been partly captured by the previous assessment, although gaps remain. Whilst there are some benefits associated with natural environment assets that sit within the ecosystem services framework, others, such as aesthetics, were not considered previously and will require description and monetisation (if possible) to enable their full value to be captured.

It should be noted that additional historic environment benefits were identified in another study on environmental capital accounting and the historic environment[22]. These benefits were identified from a review of historic environment valuation methods and included benefits such as hands-on skills development, investment, regeneration, and provision of employment/work through the requirement for repair and maintenance of heritage assets. These additional benefits also sit outside of the natural capital accounting and ecosystem services framework and would therefore not be captured within this approach. Whilst some of these additional benefits may be relevant to the assets considered here, more detailed data on each asset would be required to enable assessment of these benefits.

5.5 Issues encountered during the task

Table 5-6 provides a list of issues with implications and the solutions/work arounds employed to deal with them.

[22] RPA & LUC (2018): Environmental Capital Accounting and the Historic Environment, Final Report for Natural England and Historic England, May 2018, Loddon, Norfolk, UK.

Table 5-6: Issues encountered during Task 4		
Issue	**Implications**	**Solution/work around**
Matching the habitats requires some judgement because the identified habitats are slightly different to the habitats/descriptions in the database of values	The task of matching habitats is dependent on one individual's interpretation and there may be some consistency issues in terms of the habitat/description allocated	Certain assumptions were made when identifying linkages to try and ensure consistency
There may be double counting between values where more than one service allocated to the same habitat uses the same value for monetisation	There may be overestimation of some benefits	Use of a spreadsheet to screen the references against each asset and service ensures that there is a transparent record of the assessment process. If double counting is thought to be occurring, the values allocated to a particular asset and its services can easily be assessed
Variation in availability of values for ecosystem services	There may be multiple values to choose from where an ecosystem service has been particularly well studied, or in some cases there may be no values available at all	Where multiple values are available for an ecosystem service, each is assessed and the best fit selected. In instances where no values are available for quantification or monetisation, the data gap is noted and qualitative description is used instead

6 Identifying the changes that need to be made to the methodology

6.1 Overview

Section 6 identifies the changes that need to be made to the methodology used in the previous Trent Valley study to enable better consideration of the benefits flowing from the historic environment. These changes aim to ensure that the values provided by the historic environment are captured within a natural capital and ecosystem services framework. Building on the previous work, the updated methodology is trialled for two assets within the Trent Valley. The section additionally discusses the wider implications for different environmental contexts.

6.2 The changes required

Whilst the historic environment and its benefits were considered by the previous Trent Valley study, changes to the methodology are needed to enable the full benefits of heritage assets to be better captured. As noted in Section 4.3, the historic environment affects services beyond those traditionally viewed as cultural services. The updated methodology therefore needs to take account of the wider range of benefits.

Table 6-1 draws on Table 4-1 to identify the ecosystem services that may flow from the historic environment via the land uses/habitats associated with each heritage asset. However, as discussed earlier, not all of the services listed can be attributed specifically to heritage. For each service, Table 6-1 identifies:

- Whether the service can be attributed to the heritage assets themselves (i.e. the services are provided as a result of the heritage asset being in place). This information is based on Table 4-1;
- Whether the service was valued in the previous study;
- If so, how the service was valued;
- What monetary value was used previously; and
- Comments on the approach and value used.

Table 6-1 shows that of the 12 services being provided by the land uses/habitats associated with each heritage asset, seven can be attributed to the heritage assets themselves. The table also indicates that although the majority of the services were monetised in the previous assessment, one service, aesthetics, was not valued. Additionally, with the exception of cultural heritage, all valued services were quantified using approaches that were not heritage-specific, meaning that the values used may not necessarily b the most appropriate for the heritage context. The implications of this are that the wide range of benefits provided by the historic environment were not fully captured through the previous methodology. The approach therefore needs to be updated to ensure that the flow of services and hence benefits influenced by the historic environment can be properly taken into account.

Table 6-1: Valuation of ecosystem services linked to land uses/habitats associated with heritage assets					
Ecosystem service linked to land use/habitat associated with heritage asset	**Ascribed to heritage?**	**Valued in the previous Trent Valley study?**	**Approach to quantifying benefits used previously**	**Monetary values and source used previously**	**Comments on approach and values**
Livestock and crop production	×	✓	Livestock and crop production: based on gross margin of crops or livestock produced	Gross margins taken from the Nix Farm Management Pocketbook	Approach may not capture all livestock and crop production benefits as the values are not heritage-specific
Biodiversity (including habitats and species)	✓	✓	Biodiversity (including habitats and species: based on habitat type and change in condition of habitat	Values based on £/ha by habitat type from TEEB database[23]	Approach may not capture all biodiversity benefits as the values are not heritage-specific
Air quality regulation	×	✓	Air quality: based on change in level of pollutants that affect air quality	Values based on study linking increase in happiness from increase in air quality related to level of PM10. Study used is from the USA and is assumed to capture happiness associated with public health impacts, i.e. may go beyond just benefits from improved air quality	Approach may not capture all air quality regulation benefits as the values are not heritage-specific
Climate regulation (emissions and sequestration of GHGs)	✓	✓	Carbon sequestration: based on changes in carbon sequestration associated with different land uses under roads, footpaths, arable land and urban soils	Value of CO_2 is based on HM Treasury values for untraded carbon	Approach may not capture all climate regulation benefits as the values are not heritage-specific

[23] TEEB is The Economics of Ecosystems and Biodiversity and includes a database of values for different habitat types and different ecosystem services. The values have been collated from international studies such that care is needed when selecting the most appropriate values to apply to the Trent Valley. Also, values have to be converted from € and uprated from 2011 values which is the base date for the values contained in the database.

Table 6-1: Valuation of ecosystem services linked to land uses/habitats associated with heritage assets					
Ecosystem service linked to land use/habitat associated with heritage asset	**Ascribed to heritage?**	**Valued in the previous Trent Valley study?**	**Approach to quantifying benefits used previously**	**Monetary values and source used previously**	**Comments on approach and values**
Water purification	×	✓	Water quality: based on level of run-off from impermeable surfaces as indication of potentially polluted water	Values based on costs of treating road runoff	Approach may not capture all water purification benefits as the values are not heritage-specific
Water regulation (large scale)	×	✓	Flood risk: based on run-off from developed land due to increased rainfall and/or intensity due to climate change	Values based on damages using Weighted Average Annual Damages from the Multi-Coloured Manual[24]	Approach may need to be widened to ensure it captures entire value of service e.g. through abstraction data
Provision of freshwater (and availability of freshwater)	×	✓	Provision of drinking water: based on volume of water licensed for abstraction	Values based on £/m^3 of water by use	Approach may not capture all freshwater benefits as the values are not heritage-specific
Educational value	✓	✓	Educational value: based on level of achievement and changes in level of achievement	Values are based on benefits of additional qualifications from BIS	Approach may not capture all educational benefits as the values are not heritage-specific
Cultural heritage	✓	✓	Heritage value: based on number of visitors to heritage sites	Values taken from a willingness to pay study for entry to Warkworth Castle[25]	Approach likely to capture cultural heritage benefits as values are specific to heritage
Aesthetics	✓	×	None	None	Approach needs to be developed

[24] The Multi-Coloured Manual is the tool used in flood risk assessments when applying for Government funding for flood risk management. It is prepared by the Flood Hazard Research Centre at Middlesex University.

[25] This is the main willingness to pay (WTP) study available for cultural sites and is based on a contingent valuation survey undertaken in 1998 which asked people for their WTP to preserve Warkworth Castle in Northumberland based on payments for entry to the Castle.

Table 6-1: Valuation of ecosystem services linked to land uses/habitats associated with heritage assets					
Ecosystem service linked to land use/habitat associated with heritage asset	**Ascribed to heritage?**	**Valued in the previous Trent Valley study?**	**Approach to quantifying benefits used previously**	**Monetary values and source used previously**	**Comments on approach and values**
Recreation and tourism	✓	✓	Recreational value: based on number of day and overnight visits to Derbyshire and Derby	Values taken from total expenditure per day or overnight visit from the ONS for domestic day and overnight visits	Approach may not capture all recreation and tourism benefits as the values are not heritage-specific
Wellbeing	✓	✓	Wellbeing, health and happiness: based on population with low life satisfaction, drawing on statistics of self-reported life satisfaction in Derbyshire and Derby	Values based on avoided costs of treating depression and anxiety and percentage improvement in condition from treatment[26]	Approach may not capture all wellbeing benefits as the values are not heritage-specific

[26] Treatment was found in Fujiwara & Dolan (2014) to cost £44,237 per person per year and results in a 40% to 46% improvement in the condition. Depression and anxiety were found to be responsible for a 1.18 reduction in life satisfaction per person. The Mental Health Foundation (2010) reports that impacts last for around two years.

6.3 The Trent Valley case study

6.3.1 Updating the methodology

The methodology developed for the previous Trent Valley study, which was based on an ecosystem services framework, needs to be further developed to better enable the benefits from heritage assets to be captured. As shown earlier in Table 6-1, since heritage-specific values were not used when quantifying most of the services, and there is no approach to quantifying benefits relating to aesthetics, a proportion of the value of heritage assets will be missing when using the methodology from the previous assessment.

As discussed in Section 4.3, the range of ecosystem services whose provision is influenced by heritage assets in the Trent Valley[27] is wider than previously considered and includes the following seven services:

- Biodiversity;
- Climate regulation (emissions and sequestration of GHGs);
- Educational value;
- Cultural heritage;
- Aesthetics;
- Recreation and tourism; and
- Wellbeing.

In order to fully capture the value of the above services in the context of the historic environment, it is necessary to look at each service in terms of heritage, rather than just the service as a whole.

For example, the approach used to quantify recreation and tourism benefits was based on the number of day and overnight visits to Derbyshire and Derby, using values taken from total expenditure per day or overnight visit from the ONS for domestic day and overnight visits. This approach could be made more relevant to the historic environment by using values based on the number of day and overnight visits to heritage assets. Table 6-2 summarises suggested revisions to the methodology used in the previous Trent Valley study to enable better consideration of the historic environment. It compares values from the previous study with alternative values available in the benefits inventory for relevant ecosystem services, and indicates where further research is needed to determine heritage-specific valuation techniques.

[27] Specifically, the 20 heritage assets identified as being relevant to the "water meadows and other water management features" context (see Table 3-2 for a list).

Table 6-2: Suggested revisions to methodology used in the previous Trent Valley study				
Ecosystem service influenced by heritage asset	**Previous approach to quantifying benefits with monetary values and source**	**Suggested developments to better enable the benefits from heritage assets to be captured**	**Appropriate benefits from the inventory**	**Example values**
Biodiversity (including habitats and species)	Biodiversity (including habitats and species: based on habitat type and change in condition of habitat Values based on £/ha by habitat type from TEEB database[28]	Inclusion of heritage specific data or use of values relating to the biodiversity value of specific land-use type assigned to the heritage asset	Charismatic species Non-charismatic species Benefits from biodiversity	No heritage-specific values available; however the following values may be used as proxy depending on the heritage context in question - Stated preference: £/ha/year value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)
Climate regulation (emissions and sequestration of GHGs)	Carbon sequestration: based on changes in carbon sequestration associated with different land uses under roads, footpaths, arable land and urban soils Value of CO_2 is based on HM Treasury values for untraded carbon	Approach could be made more appropriate through use of values for historic building emissions (where relevant)	No match	No heritage-specific values available; however the following values may be used as proxy depending on the heritage context in question: - Benefit transfer £/year: carbon sequestration by restored mudflat, saltmarsh and reedbed habitat - Benefit transfer £/year: carbon sequestration from buffer zoning (330m) on the upper Bristol Avon - Benefit transfer £: climate regulation benefits (not specified) arising from marine protected areas designation in the UK

[28] TEEB is The Economics of Ecosystems and Biodiversity and includes a database of values for different habitat types and different ecosystem services. The values have been collated from international studies such that care is needed when selecting the most appropriate values to apply to the Trent Valley. Also, values have to be converted from € and uprated from 2011 values which is the base date for the values contained in the database.

Table 6-2: Suggested revisions to methodology used in the previous Trent Valley study				
Ecosystem service influenced by heritage asset	**Previous approach to quantifying benefits with monetary values and source**	**Suggested developments to better enable the benefits from heritage assets to be captured**	**Appropriate benefits from the inventory**	**Example values**
Educational value	Educational value: based on level of achievement and changes in level of achievement Values are based on benefits of additional qualifications from BIS	Inclusion of values relating to education in a heritage setting	No match	No heritage-specific values available: further research and data needed
Cultural heritage	Heritage value: based on number of visitors to heritage sites Values taken from a willingness to pay study for entry to Warkworth Castle[29]	Cultural heritage was adequately captured using the previous approach, although additional values have been identified in the benefits inventory	No match	Additional values: - Benefit transfer £/ha/year: value of cultural heritage in the marine environment - Benefit transfer £/year: cultural values (largely volunteer activities) from buffer zoning (330m) on the upper Bristol Avon - Benefit transfer £: value of cultural heritage (unspecified) arising from marine protected areas designation in the UK

[29] This is the main WTP study available for cultural sites and is based on a contingent valuation survey undertaken in 1998 which asked people for their wTP to preserve Warkworth Castle in Northumberland based on payments for entry to the Castle.

Table 6-2: Suggested revisions to methodology used in the previous Trent Valley study				
Ecosystem service influenced by heritage asset	**Previous approach to quantifying benefits with monetary values and source**	**Suggested developments to better enable the benefits from heritage assets to be captured**	**Appropriate benefits from the inventory**	**Example values**
Aesthetics	None	Aesthetic benefits were not previously considered. Inclusion of values relating to aesthetics will enable this aspect of the historic environment to be captured	Aesthetics (local ponds) Aesthetics (property prices) Aesthetics (avoiding presence of litter / dog mess) Groundwater scheme (property) Aesthetics (street greening)	No heritage-specific values available; however the following values may be used as proxy depending on the heritage context in question: - Stated preference: £/household/year in avoiding presence of litter / dog mess - Increase in property prices for 1% increase in water share of land use - £/resident/month: value to residents for street improvement through planting of small/large trees and green verges along the street
Recreation and tourism	Recreational value: based on number of day and overnight visits to Derbyshire and Derby Values taken from total expenditure per day or overnight visit from the ONS for domestic day and overnight visits	Use of values relating to recreation or tourism in a heritage setting	Angling Recreation (land) Activity (walking/cycling) Activity (horse riding) Recreation (water)	No heritage-specific values available; however the following values may be used as proxy depending on the heritage context in question: - Willingness to pay £/visit: to reinstate fishery - £/visit: general use of park (playgrounds, trails, dog walking) - £/visit: average value of leisure time (walking and cycling) - based on time spent at location and value of time - Willingness to pay £ per person (horse riding) - Meta-analysis £/person/visit: value of general recreational visit (freshwater and floodplains)

Table 6-2: Suggested revisions to methodology used in the previous Trent Valley study				
Ecosystem service influenced by heritage asset	**Previous approach to quantifying benefits with monetary values and source**	**Suggested developments to better enable the benefits from heritage assets to be captured**	**Appropriate benefits from the inventory**	**Example values**
Wellbeing	Wellbeing, health and happiness: based on population with low life satisfaction, drawing on statistics of self-reported life satisfaction in Derbyshire and Derby Values based on avoided costs of treating depression and anxiety and percentage improvement in condition from treatment[30]	Use of values relating to wellbeing in a heritage setting	Sense of place	No heritage-specific values available; however the following values may be used as proxy depending on the heritage context in question: - Stated preference: £/ha/year value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)

[30] Treatment was found in Fujiwara & Dolan (2014) to cost £44,237 per person per year and results in a 40% to 46% improvement in the condition. Depression and anxiety were found to be responsible for a 1.18 reduction in life satisfaction per person. The Mental Health Foundation (2010) reports that impacts last for around two years.

6.3.2 Summary of the updated methodology

Figure 6-1 provides a summary of the updated methodology.

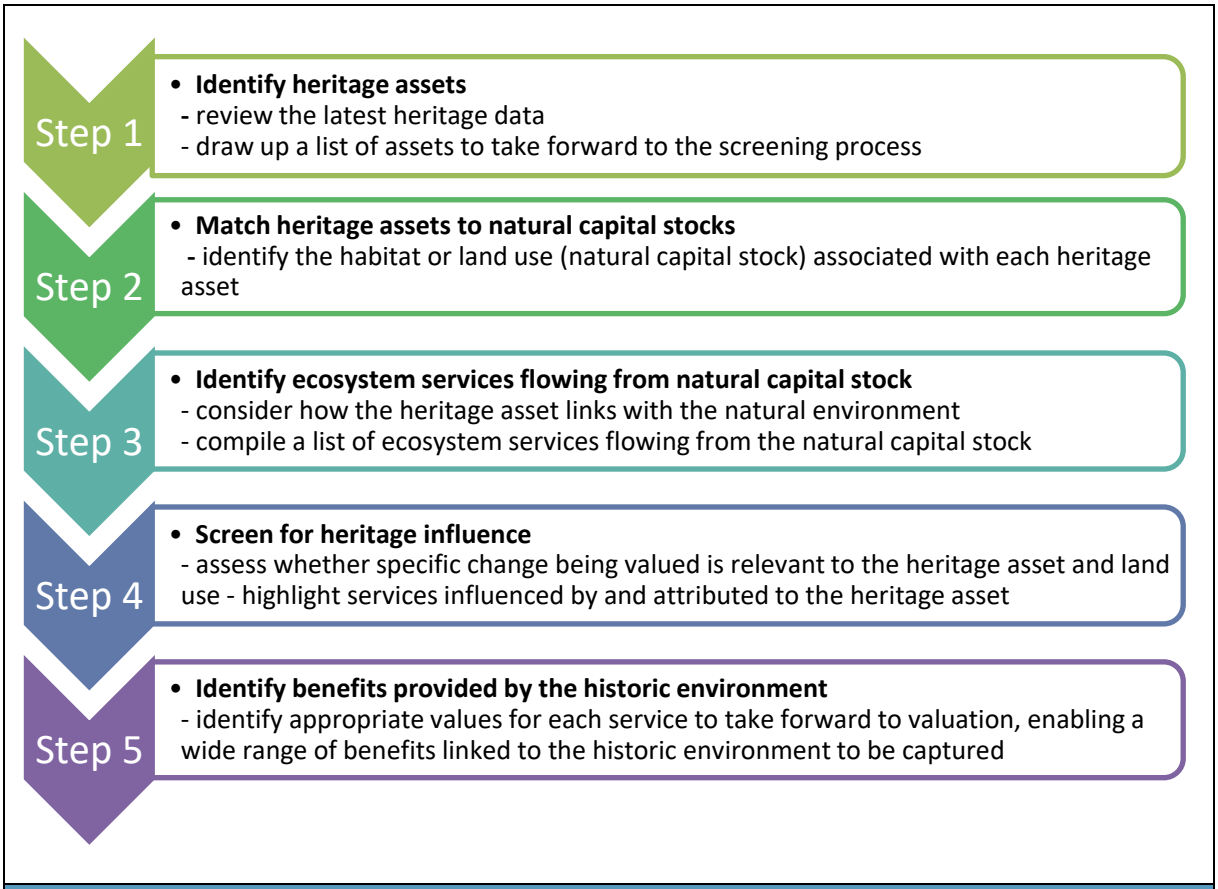

Figure 6-1: Summary of the methodology for identifying the benefits of heritage assets

A further step, application of the monetary values, could be carried out subject to obtaining additional information on each asset. This information could include, for example, data on the size/area covered by each asset and the number of visits per year (where public access is possible). Whilst some of this information could probably be obtained (or estimated in the case of number of visits) from internet research, the majority of it would require a site visit. Due to the specific and individual nature of heritage assets, this final step has therefore not been undertaken here.

6.3.3 Application of the methodology to two heritage assets

Tables A4-1 and A4-2 in Annex 4 present the results of applying steps 1 to 5 above to two heritage assets identified during this study: Elvaston Castle and gardens, and Trent and Mersey Canal, Canal Milepost West of Hickens Bridge. The tables show the benefits that are believed to be attributed to the heritage assets (based on the habitats/land uses associated with them) and the ways in which these benefits could be monetised. Final monetary values of the benefits are not provided since this would require additional information to that available to this desk-based study. This exercise does however illustrate that:

- Each heritage asset is contributing to the provision of several services (i.e. more services than were acknowledged as being linked to the historic environment in the previous Trent Valley study);
- There are various ways in which the benefits from these services could be monetised. The most appropriate value in each case will depend on factors such as the level of access to the site, its area, the number of visits per year, etc. and
- For some of the benefits provided (e.g. educational value), further research may be needed to identify ways to assign a monetary value to the benefits.

The updated methodology therefore enables the wider benefits of heritage assets to be taken into account; i.e. it moves beyond considering cultural services alone to enabling other types of service, such as biodiversity and climate regulation, to be attributed to the historic environment through the way in which heritage assets influence natural capital.

6.3.4 The Trent Valley landscape as a heritage asset

As mentioned in Section 3.3.1, alongside the exploration and valuation of individual heritage assets, consideration can be given to the broader definition of the Trent Valley's wetland landscape as a heritage asset in itself and how this could be incorporated by the assessment methodology. Thinking of the wetland area as a whole would allow capture of landscape values which might otherwise be overlooked when focusing on individual assets alone. However, it is important to note that this study does not aim to provide a comprehensive review of the area's historic environment. HLC records were excluded to avoid the risk of double counting and because their inclusion would have required quantitative analysis of county-wide HLC data to understand relative abundance/rarity of types and likely levels of significance. Such an exercise was considered to be beyond the scope of this study.

The individual heritage assets were selected on the basis of their relevance to the theme of "water meadows and water management features". Seven services were subsequently identified as being influenced by the heritage assets within this environmental context. Whilst the services provided by each asset could be considered at the individual asset level, these services may be valued more highly when evaluated as part of the wider landscape. For example, recreation and tourism benefits may be greater for the Trent Valley wetland landscape overall than if each asset were considered individually, since the landscape (consisting of many assets within the same environmental context) may have more tourist appeal as a destination than a set of individual assets that are not linked. Similarly, there may be a greater variety of habitats provided at the landscape scale than on an individual heritage asset basis, thus creating higher biodiversity value.

The process for identifying and assessing the provision of services and benefits at the landscape scale would be similar to the methodology used for the individual heritage assets. Careful consideration would, however, need to be given to data collection and management due to the number of heritage records within the case study area. Whilst the Trent Valley overall might provide similar services and benefits to those provided by the individual assets, different values would likely be selected to monetise the benefits at a landscape scale. For example, for recreation benefits, visitors may be viewed as willing to pay more per visit for a site that was larger and incorporated several heritage assets than for a site with a single asset. A site supporting a larger number of species might also be allocated a higher value for biodiversity.

Building on the overarching vision for cultural heritage that was developed in the previous Trent Valley study, consideration of the Trent Valley's wetland landscape as a heritage asset in itself would

likely assist in the promotion of the cultural value of the Trent Valley and its role throughout history as a visitor attraction, as well as part of any wider tourism strategy.

6.4 Implications for different environmental contexts

This study has tested a revised methodology in the context of "water meadows and water management features". However, the revised methodology will have many uses, both within this initiative and through application to other locations and in different environmental contexts, including:

- Marine and coastal environments (with heritage assets including e.g. wrecks);
- Chalk/limestone grassland;
- Boundaries and linear landscape features – hedgerows, walls, holloways and linear earthworks;
- Wetlands and peat – terrestrial, coastal and marine;
- Woodland and parkland;
- Designed landscapes (urban/rural and private/public);
- Urban and peri-urban features like public parks, street trees and private gardens; and
- Structures (including ruins) – built heritage as ecosystem.

Application of the methodology to another environmental context will result in different heritage assets being identified, and subsequently the identification of alternative habitats/land uses and ecosystem services flowing from these stocks. Some environmental contexts may result in the attribution of a greater number of services to the historic environment (i.e. where the heritage assets themselves are thought to impact the flow of services from the natural capital stock). This may particularly be the case for the environmental context of "structures (including ruins) – built heritage as ecosystem", where the heritage assets themselves are likely to form part of the natural capital stock and thus contribute directly to service provision.

Whatever the environmental context, it is important to note that condition of the asset/habitat affects the extent to which a service can be provided. Some environmental contexts may be more accessible or better studied than others, thus condition information may be more likely to be available. For example, designed landscapes such as parkland associated with a historic house may be easily accessible and there may also be records available documenting the creation of the asset. In contrast, for marine and coastal environments, access may need specialist equipment hence there may be less information available, or records may be updated less frequently. In such contexts, it may be more difficult to obtain condition data, meaning that the assessment of ecosystem service provision and hence benefits as per the updated methodology may perhaps be less robust.

Although this study considered the idea of developing a typology of assets to link to natural capital and the provision of services (and benefits), the variation between the heritage assets and services provided meant that this was not feasible. Using a typology would have resulted in too much generalisation, leading to the benefits from some heritage assets being underestimated whilst others may have been overestimated. The need to consider each heritage asset individually means that whilst the same process can be applied whatever the environmental context, it is not possible to develop general rules/types for identifying the services and benefits within any particular environmental context. The number of factors affecting service provision and hence benefits from any one asset (see Figure 6-2) is too great for such a typology to be considered useful. This limitation is discussed further in Table 6-3 below.

Figure 6-2: Factors affecting benefits provided by heritage assets

6.5 Issues encountered during the task

Table 6-3 overleaf provides a list of issues with implications and the solutions/work arounds employed to deal with them during Task 5.

Table 6-3: Issues encountered during Task 5		
Issue	**Implications**	**Solution/work around**
Initial plan to develop a typology of assets to link to natural capital and provision of benefits was not taken forwards – different assets associated with similar habitats/land use were found to provide different services, thus applying a typology would have masked differences and meant that some services were not picked up, potentially undervaluing the contribution of the heritage asset	Each asset had to be considered individually when assessing the likely provision of ecosystem services and identifying the services attributable to the heritage asset itself	The revised methodology was developed to be applied at the asset level rather than the landscape level (this built on the approach taken in the previous study, which started by identifying assets)
Initial plan to identify drivers of change and the subsequent implications for asset condition and ecosystem service provision was considered, but could not be completed due to a lack of information on factors likely to be affecting condition	Information on known risks to the asset or risks that may emerge was not included in the dataset obtained for this study, thus could not be used in the overall assessment of what services were being provided. This means the assessment is based on a point in time, rather than representing benefits over time	The condition of the asset taken forwards was that which was determined at the point of assessment (e.g. through aerial photographs)

7 Summary of responses to the research questions

7.1 Reponses to the research questions

Table 7-1 provides a summary the response to each research question based on the work carried out. It brings together the information from the previous sections, providing links to relevant tables and data as required.

Table 7-1: Contribution to research questions

Research question	Summary of response to question
1. What heritage assets exist within the Trent Valley case study area?	An inventory of assets has been produced. In total, 20 heritage assets were taken forwards for use in this case study (see Table 3-2)
2. How do the heritage and environmental assets interact and link with each other?	Natural capital stocks associated with each asset were identified via an assessment of habitat and land use associated with each heritage asset using internet mapping applications. Table 3-4 provides a list of the heritage assets along with the land use/habitat associated with them
3. How do changes in heritage capital result in changes to natural capital, and vice versa	An initial list of services provided by the natural capital stocks was identified; a subset of services influenced by/attributed to heritage assets was then determined. Information on the condition of heritage assets was used to help identify which services were likely to be directly influenced by the heritage nature of the asset rather than natural capital alone. Changes in heritage asset condition (i.e. heritage capital) could result in changes in service provision from the habitat/land use (i.e. natural capital) associated with the asset. Table 4-1 provides the list of services thought to be provided by each heritage asset with an indication of those services influenced by the heritage nature of the asset
4. How can the values provided by the heritage assets be recorded in an ecosystem services framework, such as that used to assess the value of the Trent Valley?	Differences in services captured between the previous assessment and the current natural capital approach were identified. Section 4.3 indicates that the range of ecosystem services that heritage assets influence is wider than considered previously. Heritage benefits identified in the current natural capital approach were compared with the ecosystem services framework used previously. This exercise showed that whilst some of the benefits identified were a good match for the services monetised previously, others were only a partial match suggesting that some of the heritage value was not adequately captured. For other benefits, the previous ecosystem services based approach had not captured the value at all (there was no match). Table 5-5 provides a summary of this matching exercise, showing the extent to which the heritage benefits identified here match the ecosystem services used previously. This suggests that the framework needs to be extended to enable the values provided by the heritage assets to be recorded.

Table 7-1: Contribution to research questions	
Research question	**Summary of response to question**
5. What other values do the heritage assets provide that are not captured by the ecosystem services framework?	The matching exercise undertaken as part of Task 4 identified several values that had not been captured within the previous ecosystem services framework. These included various aspects relating to aesthetics (e.g. impacts on property prices, aesthetics associated with avoiding the presence of litter). The previous ecosystem services based approach may only have been partially capturing other aspects of heritage value. Many of these aspects could be seen as sub-sets of the benefits considered, for example, angling could be a sub-set of wider recreation benefits. Thus, using a more detailed set of values that are specific to these different benefit types could ensure that their benefits are properly captured and help avoid under- or over-estimation. More discussion is in Section 5.4
6. What changes need to be made to the methodology so that all of the benefits can be captured?	Section 6.2 identifies the changes that need to be made to the methodology. It indicates that a wider range of benefits needs to be considered than previously. Table 6-1 provides a comparison of the services identified as flowing from heritage assets in this study and those services monetised previously. It also comments on the approach used for monetisation and whether this is likely to be capturing the full value of the benefits
7. How does the Trent Valley and water meadows and water management environmental context show how heritage assets can be taken into account and can influence decision-making	Table 6-2 draws on the services identified as being provided by the 20 heritage assets to suggest revisions to the methodology. Use of the Trent Valley water meadows and water management environmental context provides a case study that can be considered in terms of the individual assets but also as a heritage landscape. The revised methodology is provided in Section 6.3.2 and is applied to two of the heritage assets in 6.3.3 with the results in Annex 4
8. What are the wider lessons for other environmental contexts?	The revised methodology can be applied to other environmental contexts. Dependent on the context chosen, there may be different land uses/habitats associated with each heritage asset and thus different services provided. Some environmental contexts may result in attribution of a greater number of services to the heritage itself (e.g. structures (including ruins) – built heritage as ecosystem may provide more services since the asset itself could be classed as a habitat). Generalisation of services provided is not thought to be possible since the type of asset, its condition and the land use/habitat associated with it will all affect the provision of services by the natural capital and the extent to which these can be attributed to the heritage capital

Annex 1 Map of the study area

Figure A1-1 provides an outline of the study area. Note that this outline was provided by Derbyshire County Council for use in the original Trent Valley economic study.

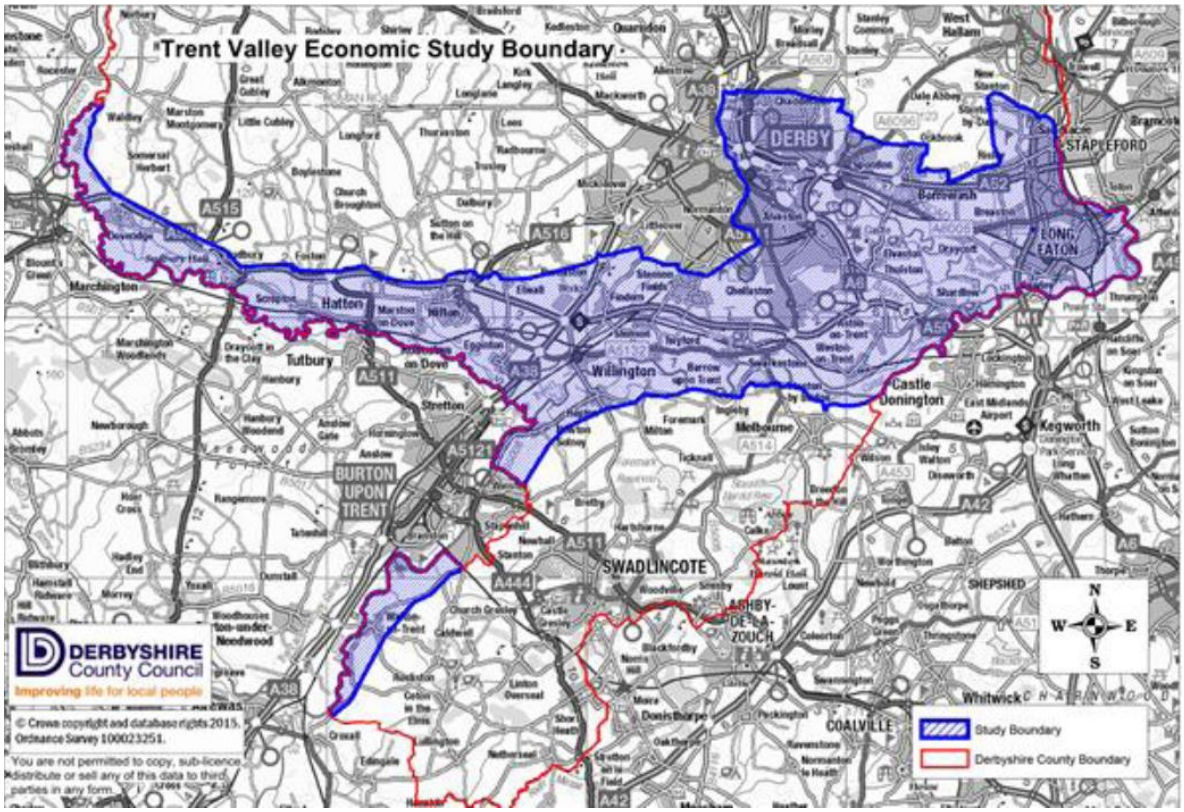

Figure A1-1: Outline of the Trent Valley study area (source: Derbyshire County Council)

Annex 2 Heritage record sheet

This annex is provided as a separate spreadsheet file.

Annex 3 Benefits inventory

This annex is provided as a separate spreadsheet file. This includes:

- Habitats and values worksheet: this provides the full list of studies from the benefits inventory (developed by RPA as a supporting output for a separate Environment Agency study)[31]. It matches the studies to habitats and land uses; and

- A worksheet for each heritage asset: these sheets provide the assessment of the values relevant to each asset. Column BA in each worksheet indicates whether each value has been identified as appropriate or not.

[31] RPA (2017): Integrated planning and natural capital economic appraisal, methodology report submitted to the Environment Agency in April 2017.

Annex 4 Application of the revised methodology to the Trent Valley

A4.1 Overview

This annex shows the application of the revised methodology to two different assets identified within the Trent Valley area, namely Elvaston Castle and gardens, and a canal milepost. The results are presented as two tables which identify, for each asset:

- The benefits determined as appropriate from the benefits inventory. These are based on:
  - The services expected to be provided by the natural capital associated with that asset; and
  - The services that the heritage asset itself is likely to be influencing the provision of.
- The values (market values, benefits transfer values or other monetary values) that are likely to be relevant to these benefits. Note that further information on each asset would likely indicate that some values were more relevant than others. This more detailed screening exercise to determine which values to apply when monetising the benefits would need to be taken following a site visit.

A4.2 Benefit types and values available for two Trent Valley assets

Table A4-1 shows the application of the revised methodology to Elvaston Castle and Gardens. It identifies the benefits expected to be provided and influenced by the heritage nature of the asset and then lists values that could be used to monetise these benefits. Table A4-2 provides similar information for a canal milepost.

It should be noted that for both of these assets, potential benefits have been identified through determining the habitat/land use associated with the asset using internet mapping applications. A site visit may reveal the presence of other habitats/land uses, with implications for the benefits expected to be provided.

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens

Benefits provided	Values likely to be relevant for monetising these benefits
Biodiversity	Charismatic and on-charismatic species - stated preference: £/ha/year value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario) Benefits from biodiversity - meta-analysis: £/ha/year value of benefits from biodiversity
Climate regulation (emissions and sequestration of GHGs)	Carbon sequestration by the marine environment – avoided cost: £/ha/year C-sequestration through land management changes – benefit transfer: £/ha/year value of carbon sequestration through land management changes as part of Tamar 2000 C-sequestration by saltwater wetlands – benefit transfer: £/year value of carbon

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	sequestration by restored mudflat, saltmarsh and reedbed habitat C-sequestration by riparian buffer - benefit transfer: £/year value of carbon sequestration from buffer zoning (330m) on the upper Bristol Avon Climate regulation in the marine environment - Benefit transfer: £ value of climate regulation benefits (not specified) arising from marine protected areas designation in the UK Damage costs for emission of pollutant into air – avoided cost: £/tonne values for 30 different types of pollutant
Educational value	No heritage-specific values available: further research and data needed
Cultural heritage	Cultural heritage of the marine environment – benefit transfer: £/ha/year value of cultural heritage in the marine environment Cultural values provided by riparian buffer – benefit transfer: £/year value of cultural values (largely volunteer activities) from buffer zoning (330m) on the upper Bristol Avon Cultural heritage of the marine environment – benefit transfer: £ value of cultural heritage (unspecified) arising from marine protected areas designation in the UK
Aesthetics	Property price premium - river quality improvement (high) - willingness to pay: % premium to property value according to environmental outcome: high impact if environmental impact is from UID or low flow Property price premium - river quality improvement (medium) - willingness to pay: % premium to property value according to environmental outcome: medium impact if change is based on UWWD (reduced eutrophication) Property price premium - river quality improvement (low) - willingness to pay: % premium to property value according to environmental outcome: low impact if changes result from RQO changes as a result of fisheries directive improvements Avoiding presence of litter / dog mess – stated preference: £/household/year Property value - proximity to landfill – hedonic pricing: % property value reduction depending on proximity to landfill site Aesthetics - urban (green space) meta-analysis: £/ha/year value per hectare of urban green space Aesthetics - street greening – stated preference: £/resident/month value to residents for street improvement through planting of small/large trees and green verges along the street (low value for small trees, med value for large trees, high value for large trees and planting) Aesthetics - increase area of local ponds – willingness to pay: £/resident/month value to residents of increasing the area of local ponds Property value increase - green space –hedonic pricing: % increase in property prices for 1% increase in green space share of land use

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	Property value increase - area of local ponds – hedonic pricing: % increase in property prices for 1% increase in water share of land use Aesthetics - increase area of local ponds – willingness to pay -£/household/year value to households of increasing the area of local ponds Property price premium (detached) - city park – hedonic pricing: % average property value premium for a detached house within 450m of city park Property price premium (flat) - city park – hedonic pricing: % average property value premium for a flat within 450m of city park Property price premium (non-detached) - city park – hedonic pricing: % average property value premium for a non-detached house within 450m of city park Property price premium (detached) - local park – hedonic pricing: % average property value premium for a detached house within 450m of local park Property price premium (flat) - local park – hedonic pricing: % average property value premium for a flat within 450m of local park Property price premium (non-detached) - local park – hedonic pricing: % average property value premium for a non-detached house within 450m of local park Property price premium (detached) - green space – hedonic pricing: % average property value premium for a detached house within 450m of green space Property price premium (flat) - green space – hedonic pricing: % average property value premium for a flat within 450m of green space Property price premium (non-detached) - green space – hedonic pricing: % average property value premium for a non-detached house within 450m of green space Property value increase - city park enhancement: % average property value increase following city park enhancement Property value increase - local park enhancement: % average property value increase following local park enhancement Property value increase - green space enhancement: % average property value increase following green space enhancement Property value increase - city park creation: % average property value increase following city park creation Property value increase - local park creation: % average property value increase following local park creation

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	Property value increase - green space creation: % average property value increase following green space creation
Recreation and tourism	Recreation - river quality improvement (RE4/5 to RE3) - willingness to pay: £/visit value of change in river quality from RE4/5 (not capable of supporting water birds) to RE3 (good enough for water birds) for informal recreation Recreation - river quality improvement (RE3/4 to RE2/3) - willingness to pay£/visit value of change in river quality from RE3/4 (good enough for water birds) to RE2/3 (good enough to support fish) for informal recreation Recreation - river quality improvement (RE2 to RE1/2) - willingness to pay: £/visit value of change in river quality RE2 (bottom) (good coarse fishery) to RE1/2 (able to support trout) for informal recreation Recreation - proximity to river - £/household/year: benefits per household within <0.5km of the river concerned Recreation - proximity to river - £/household/year: benefits per household within 0.5-3.0km of the river concerned Recreation - proximity to river - £/household/year: benefits per household within 3-12km of the river concerned Recreation - proximity to river - £/household/year: benefits per household within 12-60km of the river concerned Recreation - proximity to river - £/household/km/year: benefits per km of river per household within <0.5km of the river concerned Recreation - proximity to river - £/household/km/year: benefits per km of river per household within 0.5-3.0km of the river concerned Recreation - proximity to river - £/household/km/year benefits per km of river per household within 3-12km of the river concerned Recreation - proximity to river - £/household/km/year: benefits per km of river per household within 12-60km of the river concerned Angling (coarse) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (none to poor) Angling (coarse) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (poor to moderate) Angling (coarse) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (moderate to good) Angling (coarse) - willingness to pay: £/km/year: benefits to angling from improvements to

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	angling quality (none to poor) Angling (coarse) - willingness to pay: £/km/year: benefits to angling from improvements to angling quality (poor to moderate) Angling (coarse) - willingness to pay: £/km/year: benefits to angling from improvements to angling quality (moderate to good) Angling (game) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (none to poor) Angling (game) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (poor to moderate) Angling (game) - willingness to pay: £/visitBenefits to angling from improvements to angling quality (moderate to good) Angling (game) - willingness to pay: £/km/year benefits to angling from improvements to angling quality (none to poor) Angling (game) - willingness to pay: £/km/year benefits to angling from improvements to angling quality (poor to moderate) Angling (game) – willingness to pay £/km/year benefits to angling from improvements to angling quality (moderate to good) Recreation - beach (average) - willingness to pay: £/beach/year benefits to recreation for improving a beach (average) Recreation - beach (small) - willingness to pay: £/beach/year benefits to recreation for improving a beach (small) Recreation - beach (large) - willingness to pay: £/beach/year benefits to recreation for improving a beach (large) Recreation - enclosed farmland - meta-analysis: £/visit value per visit to sites for informal recreation activities (e.g. walking, dog-walking, picnics) i.e. not specialist Recreation - freshwater, wetlands and floodplains: 1. Meta-analysis 2. Travel cost method: £/visit value per visit Recreation – marine - 1. Meta-analysis 2. Travel cost method 3. Travel cost method: £/visit value per visit Recreation - mountains, moors and heaths - travel cost: £/visit value per visit Recreation - semi-natural grassland - meta-analysis: £/visit value per visit Recreation - urban (green space) - meta-analysis: £/visit value per visit

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	Recreation – woodland - 1. Stated preference: contingent valuation and choice experiment; travel cost method 2. Stated preference: contingent valuation; value transfer 3. Meta-analysis: £/visit value per visit Walking/cycling: £/visit use of green space for walking and cycling Recreation – wetlands: £/ha/year recreational benefits from constructed wetlands Recreation – forests - travel cost: £/visit value per visit to forest with limited access/amenities Angling (coarse) - benefit transfer: £/visit willingness to pay for additional angling visit (coarse) Angling (game) - benefit transfer: £/visit willingness to pay for additional angling visit (game) Nature watching - benefit transfer: £/visit willingness to pay for additional visit for nature watchers visiting forests Recreation – grasslands - meta-analysis: £/person/visit value of general recreational visit Recreation - freshwater and floodplains - meta-analysis: £/person/visit value of general recreational visit Recreation - greenbelt and urban fringe - meta-analysis: £/person/visit value of general recreational visit Hill walking: £/visit value per visit Casual walking: £/visit value per visit (average visit is 6 hours) Freshwater angling - willingness to pay: £/visit willingness to pay for coarse fishing in and around Leeds Bird watching - willingness to pay: £/visit willingness to pay of nature watchers visiting forests Game shooting - willingness to pay £/visit: willingness to pay to avoid loss of deer to shoot Cycling - willingness to pay: £/person willingness to pay per person Horse riding - willingness to pay: £/person willingness to pay per person Woodland visit (local up to 10 miles): £/visit value of general recreational visit Rutland Water (multiple uses) - revealed preference: £/visit made up of travel costs £9.40 and 16.10 for time General park uses - £/visit:general use of park (playgrounds, trails, dog walking)

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	Green space use : £/visit average value of leisure time (walking and cycling) - based on time spent at location and value of time Expenditure during visits to natural environment- stated preference: £/visit average expenditure during visits to the natural environment Expenditure during visits to nature reserve - stated preference: £/site/year estimated visitor spending to the local economy within 20 miles of the RSPB Leighton Moss reserve and neighbouring sites in Silverdale, Lancashire Recreation - nature reserve - stated preference: £/household/year value of access to Wren's Nest National Nature Reserve Expenditure during visits to nature reserve: £/site/year estimated visitor spending to the local economy (Forest of Dean) of the Symond's Yat Rock reserve in Gloucestershire Trout and salmon fishing -willingness to pay: £/household/year value willing to pay for river habitat improvements that significantly improve the quality and quantity of trout and salmon in the River Wye Recreation - natural environment - stated preference: £/household/year average value of access to the Jurassic Coast with interpretive material Recreation - natural environment – Unknown: £/visit average value of recreational visit to silverstrand Beach, near Galway (Ireland) Walking (lowlands) - willingness to pay: £/person/year average value of access to improved site (lowland) Walking (highlands) - willingness to pay: £/person/year average value of access to improved site (highland) Informal recreation - improved river quality - willingness to pay: £/visit willingness to pay for improving river quality through removal of litter and filling channel with water for informal recreation Informal recreation - improved river quality - willingness to pay: £/user willingness to pay for improving river quality through the creation of new meanders, bankside planting and some habitat creation for informal recreation Informal recreation - improved river quality - willingness to pay; £/person/visit willingness to pay for improving river quality through river restoration through channel modifications, habitat creation and landscaping for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay for improvement from low flows every 4 or 5 years out of 20 years to full restoration to low flows once every 20 years for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay for improvement from low flow conditions to environmentally acceptable flow regime

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	in River Darent for informal recreation Informal recreation - improved flows/levels - willingness to pay; £/household/year willingness to pay for improvement from low flow conditions to full restoration of River Avon at Malmesbury for informal recreation Informal recreation - improved flows/levels willingness to pay £/household/year: willingness to pay for improvement from low flow conditions to full restoration of River Tavy at Tavistock for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay for improvement from current level of abstraction to 5cm increase in water levels for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay to avoid change from current level of abstraction to 5cm decrease in water levels for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay to avoid change from current level of abstraction to 45cm decrease in water levels for informal recreation Informal recreation - improved flows/levels - willingness to pay £/household/year: willingness to pay to avoid change from current level of abstraction to 1m decrease in water levels for informal recreation Birdwatching - improved wetlands - meta-analysis: £/ha/year value for improving wetland to support birds (for birdwatching) Birdwatching - improved wetlands - willingness to pay £/visit value for provision of birdwatching at different inland wetland sites (Tudeley Woods, Weir Woods and Pulborough Brooks) Birdwatching - improved wetlands - willingness to pay - £/visit: willingness to pay for the protection of site quality and characteristics against future damage and loss of birdwatching and habitat Angling (coarse) - improved water quality - willingness to pay £/person/visit: willingness to pay for creation of poor quality fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2) Angling (coarse) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of moderate quality fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2) Angling (coarse) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of good quality fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2) Angling (coarse) - improved water quality - willingness to pay: £/person/visit marginal value to

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	improve fishery quality from no fishery to poor quality Angling (coarse) - improved water quality - willingness to pay: £/person/visit marginal value to improve fishery from poor quality to moderate quality Angling (coarse) - improved water quality - willingness to pay: £/person/visit marginal value to improve fishery from moderate quality to good quality Angling (trout) - improved water quality -willingness to pay: £/person/visit willingness to pay for creation of poor quality trout fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2) Angling (trout) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of moderate quality trout fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2) Angling (trout) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of good quality trout fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2) Angling (trout) - improved water quality - willingness to pay: £/person/visit marginal value to improve trout fishery quality from no fishery to poor quality Angling (trout) - improved water quality – willingness to pay: £/person/visit marginal value to improve trout fishery from poor quality to moderate quality Angling (trout) - improved water quality - willingness to pay: £/person/visit marginal value to improve trout fishery from moderate quality to good quality Angling (salmon) - improved water quality - willingness to pay £/person/visit: willingness to pay for creation of a new, good quality salmon fishery, where an average angler has a 1 in 10 chance of catching a salmon each day Angling - improved flows/levels - willingness to pay: £/visit willingness to pay to reinstate fishery Angling - improved flows/levels - willingness to pay: £/year willingness to pay to improve flows and thus increase number of angling days in June, July and August (club anglers) Angling - improved flows/levels -willingness to pay: £/year willingness to pay to improve flows and thus increase number of angling days in June, July and August (syndicate members) Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for river coarse fishery in England Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for river coarse fishery in Wales Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	for river coarse fishery in Scotland Angling - economic rent river coarse fishery - market prices: £/rod/day economic rent value for river coarse fishery Angling - economic rent river coarse fishery - market prices: £/peg/year economic rent value for river coarse fishery Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for improving coarse fishery quality from no fishery to poor Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for improving coarse fishery quality from poor quality to moderate quality Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for improving coarse fishery quality from moderate quality to good quality Angling - economic rent river coarse fishery - market prices: £/km/year economic rent marginal value for improving coarse fishery quality from no fishery to poor Angling - economic rent river coarse fishery - market prices: £/km/year economic rent marginal value for improving coarse fishery quality from poor quality to moderate quality Angling - economic rent river coarse fishery - market prices: £/km/year economic rent marginal value for improving coarse fishery quality from moderate quality to good quality Angling - economic rent trout fishery - market prices: £/km/year economic rent value for trout fishery in England Angling - economic rent trout fishery - market prices: £/km/year economic rent value for trout fishery in Wales Angling - economic rent trout fishery - market prices: £/km/year economic rent value for trout fishery in Scotland Angling - economic rent trout fishery - market prices: £/rod/day economic rent value for trout fishing in stocked water Angling - economic rent trout fishery - market prices: £/rod/day economic rent value for trout fishing in wild fisheries in lowland rivers Angling - economic rent trout fishery - market prices: £/rod/day: economic rent value for trout fishing in wild fisheries upland waters Angling - economic rent trout fishery - market prices: £/day economic rent value for trout fishing in stillwater fisheries (2 to 6 fish)

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	Angling - economic rent trout fishery – market prices: £/0.5day economic rent value for trout fishing in stillwater fisheries (2 fish) Angling - economic rent trout fishery - market prices: £/evening economic rent value for trout fishing in stillwater fisheries (1 to 2 fish) Angling - economic rent trout fishery - market prices: £/ha economic rent value for trout fishing in stillwater fisheries (seasonal let of a site to an angling club) Angling - economic rent trout fishery - market prices: £/km/year economic rent value for improving trout fishery quality from no fishery to poor Angling - economic rent trout fishery -market prices: £/km/year economic rent value for improving trout fishery quality from poor quality to moderate quality Angling - economic rent trout fishery - market prices: £/km/year economic rent value for improving trout fishery quality from moderate quality to good quality Angling - economic rent trout fishery - market prices £/km/year: economic rent marginal value for improving trout fishery quality from no fishery to poor Angling - economic rent trout fishery -market prices: £/km/year economic rent marginal value for improving trout fishery quality from poor quality to moderate quality Angling - economic rent trout fishery - market prices: £/km/year economic rent marginal value for improving trout fishery quality from moderate quality to good quality Instream recreation - improved water quality: £/visit value for improvement to canal to make boating possible Instream recreation - improved water quality: £/person/visit value to maintain the UK canal network in a state fit to support boating activities Recreation in the marine environment - factor Income / Production Function: £/ha/year value of recreation in the marine environment Recreation benefits for farms (Tamar 2000) - benefit transfer: £/year recreation/tourism benefits (including fishing, shooting, holiday lets and employment creation) to farms as part of Tamar 2000 Recreation - saltwater wetlands - benefit transfer: £/year recreational benefits from Alkborough Flats scheme (excluding informal recreation) Angling - riparian buffer - market prices: £/year angling from buffer zoning (330m) on the upper Bristol Avon Tourism - riparian buffer - benefit transfer: £/year tourism from buffer zoning (330m) on the upper Bristol Avon

Table A4-1: Values available for capturing the heritage benefits of Elvaston Castle and gardens	
Benefits provided	**Values likely to be relevant for monetising these benefits**
	Informal recreation - benefit transfer: £/year local amenity and informal enjoyment from buffer zoning (330m) on the upper Bristol Avon Recreation - marine environment – benefit transfer £ value of recreation arising from marine protected areas designation in the UK Hunting / fishing - benefit transfer £/ha/year value of hunting/fishing (recreational) in proposed conservation zone in Lyme Bay Recreation - open ocean – market prices: £/ha/year value of recreation in proposed conservation zone in Lyme Bay
Wellbeing	Sense of place - stated preference: £/ha/year value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
Educational value	No heritage-specific values available: further research and data needed
Cultural heritage	Cultural heritage of the marine environment – benefit transfer: £/ha/year value of cultural heritage in the marine environment Cultural values provided by riparian buffer – benefit transfer: £/year value of cultural values (largely volunteer activities) from buffer zoning (330m) on the upper Bristol Avon Cultural heritage of the marine environment – benefit transfer: £ value of cultural heritage (unspecified) arising from marine protected areas designation in the UK
Aesthetics	Property price premium - river quality improvement (high) - willingness to pay: % premium to property value according to environmental outcome: high impact if environmental impact is from UID or low flow Property price premium - river quality improvement (medium) - willingness to pay: % premium to property value according to environmental outcome: medium impact if change is based on UWWD (reduced eutrophication) Property price premium - river quality improvement (low) - willingness to pay: % premium to property value according to environmental outcome: low impact if changes result from RQO changes as a result of fisheries directive improvements Avoiding presence of litter / dog mess – stated preference: £/household/year Property value - proximity to landfill – hedonic pricing: % property value reduction depending on proximity to landfill site Aesthetics - urban (green space) meta-analysis: £/ha/year value per hectare of urban green space

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	Aesthetics - street greening – stated preference: £/resident/month value to residents for street improvement through planting of small/large trees and green verges along the street (low value for small trees, med value for large trees, high value for large trees and planting) Aesthetics - increase area of local ponds – willingness to pay: £/resident/month value to residents of increasing the area of local ponds Property value increase - green space –hedonic pricing: % increase in property prices for 1% increase in green space share of land use Property value increase - area of local ponds – hedonic pricing: % increase in property prices for 1% increase in water share of land use Aesthetics - increase area of local ponds – willingness to pay -£/household/year value to households of increasing the area of local ponds Property price premium (detached) - city park – hedonic pricing: % average property value premium for a detached house within 450m of city park Property price premium (flat) - city park – hedonic pricing: % average property value premium for a flat within 450m of city park Property price premium (non-detached) - city park – hedonic pricing: % average property value premium for a non-detached house within 450m of city park Property price premium (detached) - local park – hedonic pricing: % average property value premium for a detached house within 450m of local park Property price premium (flat) - local park – hedonic pricing: % average property value premium for a flat within 450m of local park Property price premium (non-detached) - local park – hedonic pricing: % average property value premium for a non-detached house within 450m of local park Property price premium (detached) - green space – hedonic pricing: % average property value premium for a detached house within 450m of green space Property price premium (flat) - green space – hedonic pricing: % average property value premium for a flat within 450m of green space Property price premium (non-detached) - green space – hedonic pricing: % average property value premium for a non-detached house within 450m of green space Property value increase - city park enhancement: % average property value increase following city park enhancement Property value increase - local park enhancement: % average property value increase following local park enhancement

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	Property value increase - green space enhancement: % average property value increase following green space enhancement Property value increase - city park creation: % average property value increase following city park creation Property value increase - local park creation: % average property value increase following local park creation Property value increase - green space creation: % average property value increase following green space creation
Recreation and tourism	Recreation - river quality improvement (RE4/5 to RE3) - willingness to pay: £/visit value of change in river quality from RE4/5 (not capable of supporting water birds) to RE3 (good enough for water birds) for informal recreation Recreation - river quality improvement (RE3/4 to RE2/3) - willingness to pay£/visit value of change in river quality from RE3/4 (good enough for water birds) to RE2/3 (good enough to support fish) for informal recreation Recreation - river quality improvement (RE2 to RE1/2) - willingness to pay: £/visit value of change in river quality RE2 (bottom) (good coarse fishery) to RE1/2 (able to support trout) for informal recreation Recreation - proximity to river - £/household/year: benefits per household within <0.5km of the river concerned Recreation - proximity to river - £/household/year: benefits per household within 0.5-3.0km of the river concerned Recreation - proximity to river - £/household/year: benefits per household within 3-12km of the river concerned Recreation - proximity to river - £/household/year: benefits per household within 12-60km of the river concerned Recreation - proximity to river - £/household/km/year: benefits per km of river per household within <0.5km of the river concerned Recreation - proximity to river - £/household/km/year: benefits per km of river per household within 0.5-3.0km of the river concerned Recreation - proximity to river - £/household/km/year benefits per km of river per household within 3-12km of the river concerned Recreation - proximity to river - £/household/km/year: benefits per km of river per household within 12-60km of the river concerned Angling (coarse) - willingness to pay: £/visit: benefits to angling from improvements to angling

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	quality (none to poor) Angling (coarse) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (poor to moderate) Angling (coarse) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (moderate to good) Angling (coarse) - willingness to pay: £/km/year: benefits to angling from improvements to angling quality (none to poor) Angling (coarse) - willingness to pay: £/km/year: benefits to angling from improvements to angling quality (poor to moderate) Angling (coarse) - willingness to pay: £/km/year: benefits to angling from improvements to angling quality (moderate to good) Angling (game) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (none to poor) Angling (game) - willingness to pay: £/visit: benefits to angling from improvements to angling quality (poor to moderate) Angling (game) - willingness to pay: £/visitBenefits to angling from improvements to angling quality (moderate to good) Angling (game) - willingness to pay: £/km/year benefits to angling from improvements to angling quality (none to poor) Angling (game) - willingness to pay: £/km/year benefits to angling from improvements to angling quality (poor to moderate) Angling (game) – willingness to pay £/km/year benefits to angling from improvements to angling quality (moderate to good) Recreation - beach (average) - willingness to pay: £/beach/year benefits to recreation for improving a beach (average) Recreation - beach (small) - willingness to pay: £/beach/year benefits to recreation for improving a beach (small) Recreation - beach (large) - willingness to pay: £/beach/year benefits to recreation for improving a beach (large) Recreation - enclosed farmland - meta-analysis: £/visit value per visit to sites for informal recreation activities (e.g. walking, dog-walking, picnics) i.e. not specialist Recreation - freshwater, wetlands and floodplains: 1. Meta-analysis 2. Travel cost method: £/visit value per visit

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	Recreation – marine - 1. Meta-analysis 2. Travel cost method 3. Travel cost method: £/visit value per visit Recreation - mountains, moors and heaths - travel cost: £/visit value per visit Recreation - semi-natural grassland - meta-analysis: £/visit value per visit Recreation - urban (green space) - meta-analysis: £/visit value per visit Recreation – woodland - 1. Stated preference: contingent valuation and choice experiment; travel cost method 2. Stated preference: contingent valuation; value transfer 3. Meta-analysis: £/visit value per visit Walking/cycling: £/visit use of green space for walking and cycling Recreation – wetlands: £/ha/year recreational benefits from constructed wetlands Recreation – forests - travel cost: £/visit value per visit to forest with limited access/amenities Angling (coarse) - benefit transfer: £/visit willingness to pay for additional angling visit (coarse) Angling (game) - benefit transfer: £/visit willingness to pay for additional angling visit (game) Nature watching - benefit transfer: £/visit willingness to pay for additional visit for nature watchers visiting forests Recreation – grasslands - meta-analysis: £/person/visit value of general recreational visit Recreation - freshwater and floodplains - meta-analysis: £/person/visit value of general recreational visit Recreation - greenbelt and urban fringe - meta-analysis: £/person/visit value of general recreational visit Hill walking: £/visit value per visit Casual walking: £/visit value per visit (average visit is 6 hours) Freshwater angling - willingness to pay: £/visit willingness to pay for coarse fishing in and around Leeds Bird watching - willingness to pay: £/visit willingness to pay of nature watchers visiting forests Game shooting - willingness to pay £/visit: willingness to pay to avoid loss of deer to shoot Cycling - willingness to pay: £/person willingness to pay per person

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	Horse riding - willingness to pay: £/person willingness to pay per person Woodland visit (local up to 10 miles): £/visit value of general recreational visit Rutland Water (multiple uses) - revealed preference: £/visit made up of travel costs £9.40 and 16.10 for time General park use - £/visit:general use of park (playgrounds, trails, dog walking) Green space use : £/visit average value of leisure time (walking and cycling) - based on time spent at location and value of time Expenditure during visits to natural environment- stated preference: £/visit average expenditure during visits to the natural environment Expenditure during visits to nature reserve - stated preference: £/site/year estimated visitor spending to the local economy within 20 miles of the RSPB Leighton Moss reserve and neighbouring sites in Silverdale, Lancashire Recreation - nature reserve - stated preference: £/household/year value of access to Wren's Nest National Nature Reserve Expenditure during visits to nature reserve: £/site/year estimated visitor spending to the local economy (Forest of Dean) of the Symond's Yat Rock reserve in Gloucestershire Trout and salmon fishing -willingness to pay: £/household/year value willing to pay for river habitat improvements that significantly improve the quality and quantity of trout and salmon in the River Wye Recreation - natural environment - stated preference: £/household/year average value of access to the Jurassic Coast with interpretive material Recreation - natural environment – Unknown: £/visit average value of recreational visit to silverstrand Beach, near Galway (Ireland) Walking (lowlands) - willingness to pay: £/person/year average value of access to improved site (lowland) Walking (highlands) - willingness to pay: £/person/year average value of access to improved site (highland) Informal recreation - improved river quality - willingness to pay: £/visit willingness to pay for improving river quality through removal of litter and filling channel with water for informal recreation Informal recreation - improved river quality - willingness to pay: £/user willingness to pay for improving river quality through the creation of new meanders, bankside planting and some habitat creation for informal recreation

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	Informal recreation - improved river quality - willingness to pay; £/person/visit willingness to pay for improving river quality through river restoration through channel modifications, habitat creation and landscaping for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay for improvement from low flows every 4 or 5 years out of 20 years to full restoration to low flows once every 20 years for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay for improvement from low flow conditions to environmentally acceptable flow regime in River Darent for informal recreation Informal recreation - improved flows/levels - willingness to pay; £/household/year willingness to pay for improvement from low flow conditions to full restoration of River Avon at Malmesbury for informal recreation Informal recreation - improved flows/levels willingness to pay £/household/year: willingness to pay for improvement from low flow conditions to full restoration of River Tavy at Tavistock for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay for improvement from current level of abstraction to 5cm increase in water levels for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay to avoid change from current level of abstraction to 5cm decrease in water levels for informal recreation Informal recreation - improved flows/levels - willingness to pay: £/household/year willingness to pay to avoid change from current level of abstraction to 45cm decrease in water levels for informal recreation Informal recreation - improved flows/levels - willingness to pay £/household/year: willingness to pay to avoid change from current level of abstraction to 1m decrease in water levels for informal recreation Birdwatching - improved wetlands - meta-analysis: £/ha/year value for improving wetland to support birds (for birdwatching) Birdwatching - improved wetlands - willingness to pay £/visit value for provision of birdwatching at different inland wetland sites (Tudeley Woods, Weir Woods and Pulborough Brooks) Birdwatching - improved wetlands - willingness to pay - £/visit: willingness to pay for the protection of site quality and characteristics against future damage and loss of birdwatching and habitat Angling (coarse) - improved water quality - willingness to pay £/person/visit: willingness to pay for creation of poor quality fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2)

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	Angling (coarse) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of moderate quality fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2) Angling (coarse) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of good quality fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2) Angling (coarse) - improved water quality - willingness to pay: £/person/visit marginal value to improve fishery quality from no fishery to poor quality Angling (coarse) - improved water quality - willingness to pay: £/person/visit marginal value to improve fishery from poor quality to moderate quality Angling (coarse) - improved water quality - willingness to pay: £/person/visit marginal value to improve fishery from moderate quality to good quality Angling (trout) - improved water quality -willingness to pay: £/person/visit willingness to pay for creation of poor quality trout fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2) Angling (trout) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of moderate quality trout fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2) Angling (trout) - improved water quality - willingness to pay: £/person/visit willingness to pay for creation of good quality trout fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2) Angling (trout) - improved water quality - willingness to pay: £/person/visit marginal value to improve trout fishery quality from no fishery to poor quality Angling (trout) - improved water quality – willingness to pay: £/person/visit marginal value to improve trout fishery from poor quality to moderate quality Angling (trout) - improved water quality - willingness to pay: £/person/visit marginal value to improve trout fishery from moderate quality to good quality Angling (salmon) - improved water quality - willingness to pay £/person/visit: willingness to pay for creation of a new, good quality salmon fishery, where an average angler has a 1 in 10 chance of catching a salmon each day Angling - improved flows/levels - willingness to pay: £/visit willingness to pay to reinstate fishery Angling - improved flows/levels - willingness to pay: £/year willingness to pay to improve flows and thus increase number of angling days in June, July and August (club anglers) Angling - improved flows/levels -willingness to pay: £/year willingness to pay to improve flows and thus increase number of angling days in June, July and August (syndicate members) Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	river coarse fishery in England Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for river coarse fishery in Wales Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for river coarse fishery in Scotland Angling - economic rent river coarse fishery - market prices: £/rod/day economic rent value for river coarse fishery Angling - economic rent river coarse fishery - market prices: £/peg/year economic rent value for river coarse fishery Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for improving coarse fishery quality from no fishery to poor Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for improving coarse fishery quality from poor quality to moderate quality Angling - economic rent river coarse fishery - market prices: £/km/year economic rent value for improving coarse fishery quality from moderate quality to good quality Angling - economic rent river coarse fishery - market prices: £/km/year economic rent marginal value for improving coarse fishery quality from no fishery to poor Angling - economic rent river coarse fishery - market prices: £/km/year economic rent marginal value for improving coarse fishery quality from poor quality to moderate quality Angling - economic rent river coarse fishery - market prices: £/km/year economic rent marginal value for improving coarse fishery quality from moderate quality to good quality Angling - economic rent trout fishery - market prices:£/km/year economic rent value for trout fishery in England Angling - economic rent trout fishery - market prices:£/km/year economic rent value for trout fishery in Wales Angling - economic rent trout fishery - market prices: £/km/year economic rent value for trout fishery in Scotland Angling - economic rent trout fishery - market prices:£/rod/day economic rent value for trout fishing in stocked water Angling - economic rent trout fishery - market prices: £/rod/day economic rent value for trout fishing in wild fisheries in lowland rivers Angling - economic rent trout fishery - market prices:£/rod/day: economic rent value for trout

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	fishing in wild fisheries upland waters Angling - economic rent trout fishery - market prices: £/day economic rent value for trout fishing in stillwater fisheries (2 to 6 fish) Angling - economic rent trout fishery – market prices: £/0.5day economic rent value for trout fishing in stillwater fisheries (2 fish) Angling - economic rent trout fishery - market prices:£/evening economic rent value for trout fishing in stillwater fisheries (1 to 2 fish) Angling - economic rent trout fishery - market prices: £/ha economic rent value for trout fishing in stillwater fisheries (seasonal let of a site to an angling club) Angling - economic rent trout fishery - market prices: £/km/year economic rent value for improving trout fishery quality from no fishery to poor Angling - economic rent trout fishery -market prices: £/km/year economic rent value for improving trout fishery quality from poor quality to moderate quality Angling - economic rent trout fishery - market prices: £/km/year economic rent value for improving trout fishery quality from moderate quality to good quality Angling - economic rent trout fishery - market prices £/km/year: economic rent marginal value for improving trout fishery quality from no fishery to poor Angling - economic rent trout fishery -market prices: £/km/year economic rent marginal value for improving trout fishery quality from poor quality to moderate quality Angling - economic rent trout fishery - market prices: £/km/year economic rent marginal value for improving trout fishery quality from moderate quality to good quality Instream recreation - improved water quality: £/visit value for improvement to canal to make boating possible Instream recreation - improved water quality: £/person/visit value to maintain the UK canal network in a state fit to support boating activities Recreation in the marine environment - factor Income / Production Function: £/ha/year value of recreation in the marine environment Recreation benefits for farms (Tamar 2000) - benefit transfer: £/year recreation/tourism benefits (including fishing, shooting, holiday lets and employment creation) to farms as part of Tamar 2000 Recreation - saltwater wetlands - benefit transfer: £/year recreational benefits from Alkborough Flats scheme (excluding informal recreation) Angling - riparian buffer - market prices: £/year angling from buffer zoning (330m) on the upper

Table A4-2: Values available for capturing the heritage benefits of Trent and Mersey Canal, Canal Milepost West of Hickens Bridge	
Benefits provided	**Values likely to be relevant to monetising these benefits**
	Bristol Avon Tourism - riparian buffer - benefit transfer: £/year tourism from buffer zoning (330m) on the upper Bristol Avon Informal recreation - benefit transfer: £/year local amenity and informal enjoyment from buffer zoning (330m) on the upper Bristol Avon Recreation - marine environment – benefit transfer £ value of recreation arising from marine protected areas designation in the UK Hunting / fishing - benefit transfer £/ha/year value of hunting/fishing (recreational) in proposed conservation zone in Lyme Bay Recreation - open ocean – market prices: £/ha/year value of recreation in proposed conservation zone in Lyme Bay
Wellbeing	Sense of place - stated preference: £/ha/year value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)

Unique Ref	Benefit (high level)	Benefit (medium level)	Benefit (low level)	Change being valued	Relevant habitat types for historic assets										
					Arable land	Boundary features	Broadleaved woodland	Canal	Gardens	Improved grassland	Managed grassland	Natural cave	River	Standing water	Urban
1	Food	Agriculture	Value of crops	Value per tonne of crop	Y										
2	Food	Agriculture	Value of livestock	Value per head of livestock						Y	Y				
3	Freshwater	Provision of water	Public water supply	Value of water for public supply by volume											Y
4	Air quality	Pollutant (air)	PM10 damage cost (Rural)	Damage costs for emission of pollutant into air											Y
5	Air quality	Pollutant (air)	PM10 damage cost (Urban)	Damage costs for emission of pollutant into air											Y
6	Air quality	Pollutant (air)	PM10 damage cost (London)	Damage costs for emission of pollutant into air											Y
7	Air quality	Pollutant (air)	SO2 damage cost (Average)	Damage costs for emission of pollutant into air											Y
8	Habitat - land	Habitat improvement	Mountains, moors and heaths	Value for improvement of mountains, moors and heath habitat											
9	Habitat - land	Habitat improvement	Semi-natural grasslands (SNGL)	Value for improvement of semi-natural grasslands habitat						Y	Y				
10	Habitat - land	Habitat improvement	Enclosed farmland	Value for improvement of enclosed farmland habitat	Y					Y	Y				
11	Habitat - land	Habitat improvement	Woodland	Value for improvement of woodland habitat			Y								
12	Habitat - water	Habitat improvement	Freshwater, wetland and floodplains (OWWF)	Value for improvement of freshwater, wetland and floodplain habitat				Y					Y	Y	
13	Habitat - water	Habitat improvement	Coastal margins	Value for improvement of coastal margin habitat		Y									
14	Recreation - water	Habitat improvement (recreation)	Recreation - river quality improvement (RE4/5 to RE3)	Value of change in river quality from RE4/5 (not capable of supporting water birds) to RE3 (good enough for water birds) for informal recreation				Y					Y		

15	Recreation - water	Habitat improvement (recreation)	Recreation - river quality improvement (RE3/4 to RE2/3)	Value of change in river quality from RE3/4 (good enough for water birds) to RE2/3 (good enough to support fish) for informal recreation				Y					Y		
16	Recreation - water	Habitat improvement (recreation)	Recreation - river quality improvement (RE2 to RE1/2)	Value of change in river quality RE2 (bottom) (good coarse fishery) to RE1/2 (able to support trout) for informal recreation				Y					Y		
17	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within <0.5km of the river concerned				Y					Y		
18	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within 0.5-3.0km of the river concerned				Y					Y		
19	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within 3-12km of the river concerned				Y					Y		
20	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within 12-60km of the river concerned				Y					Y		
21	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within <0.5km of the river concerned				Y					Y		
22	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within 0.5-3.0km of the river concerned				Y					Y		
23	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within 3-12km of the river concerned				Y					Y		
24	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within 12-60km of the river concerned				Y					Y		
25	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
26	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	

27	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
28	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
29	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	
30	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
31	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
32	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	
33	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
34	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
35	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	
36	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
37	Aesthetics	Property prices	Property price premium - river quality improvement (high)	% premium to property value according to environmental outcome: high impact if environmental impact is from UID or low flow				Y					Y		

38	Aesthetics	Property prices	Property price premium - river quality improvement (medium)	% premium to property value according to environmental outcome: medium impact if change is based on UWWD (reduced eutrophication)				Y					Y		
39	Aesthetics	Property prices	Property price premium - river quality improvement (low)	% premium to property value according to environmental outcome: low impact if changes result from RQO changes as a result of fisheries directive improvements				Y					Y		
40	Recreation - water	Habitat improvement (recreation)	Recreation - beach (average)	Benefits to recreation for improving a beach (average)											
41	Recreation - water	Habitat improvement (recreation)	Recreation - beach (small)	Benefits to recreation for improving a beach (small)											
42	Recreation - water	Habitat improvement (recreation)	Recreation - beach (large)	Benefits to recreation for improving a beach (large)											
43	Water purification and waste treatment	Habitat improvement	River water quality bad to poor	Water quality improvement (bad to poor)				Y					Y		
44	Water purification and waste treatment	Habitat improvement	River water quality poor to moderate	Water quality improvement (poor to moderate)				Y					Y		
45	Water purification and waste treatment	Habitat improvement	River water quality moderate to good	Water quality improvement (moderate to good)				Y					Y		
46	Water purification and waste treatment	Habitat improvement	Coastal, lakes and transitional waters water quality bad to poor	Water quality improvement (bad to poor)											
47	Water purification and waste treatment	Habitat improvement	Coastal, lakes and transitional waters water quality poor to moderate	Water quality improvement (poor to moderate)											
48	Water purification and waste treatment	Habitat improvement	Coastal, lakes and transitional waters water quality moderate to good	Water quality improvement (moderate to good)											

49	Habitat - water	Habitat creation	Low quality wetland created	Low quality wetland created (based on the wetland providing recreation and general non-use social values)										Y	
50	Habitat - water	Habitat creation	Medium quality wetland created	Medium quality wetland created (based on the wetland providing the values for low-value wetland plus water quality services and biodiversity enhancement)										Y	
51	Habitat - water	Habitat creation	High quality wetland created	High quality wetland created (based on the wetland providing the values for low-value wetland plus flood water storage, passive values)										Y	
52	Freshwater	Groundwater	Groundwater - long run marginal costs (water companies)	Water and wastewater treatment savings from direct groundwater abstraction											
53	Freshwater	Groundwater	Groundwater - industry (pulp and paper)	Value of groundwater for pulp and paper industry											
54	Freshwater	Groundwater	Groundwater - industry (chemical)	Value of groundwater for chemical industry											
55	Freshwater	Groundwater	Groundwater - industry (general)	Value of groundwater for general industry											
56	Freshwater	Groundwater	Groundwater - industrial abstraction	Savings to industry from direct abstraction. Direct industrial abstraction of groundwater based on market price of alternative water supply less other costs included.											

57	Freshwater	Groundwater	Groundwater - abstraction and treatment	Marginal values from Scottish Government for abstraction and treatment of groundwater for households											
58	Freshwater	Groundwater	Groundwater - replacement cost	Water replacement cost based on the sale price of domestic water supply divided by a factor representing all abstraction and processing costs for a hybrid site in the East Midlands											
59	Freshwater	Groundwater	Groundwater - irrigation (potatoes)	Value of water for irrigation, based on yield and quality benefits for potatoes	Y										
60	Freshwater	Groundwater	Groundwater - irrigation (carrots)	Value of water for irrigation, based on yield and quality benefits for carrots	Y										
61	Freshwater	Groundwater	Groundwater - irrigation (parsnips)	Value of water for irrigation, based on yield and quality benefits for parsnips	Y										
62	Freshwater	Groundwater	Groundwater - irrigation (leeks)	Value of water for irrigation, based on yield and quality benefits for leeks	Y										
63	Freshwater	Groundwater	Groundwater - irrigation (salad onions)	Value of water for irrigation, based on yield and quality benefits for salad onions	Y										
64	Freshwater	Groundwater	Groundwater - aquaculture	Scottish market values for aquaculture abstraction of groundwater											

65	Freshwater	Groundwater	Groundwater scheme - human health impacts (NOx)	NOx: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
66	Freshwater	Groundwater	Groundwater scheme - human health impacts (SOx)	SOx: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
67	Freshwater	Groundwater	Groundwater scheme - human health impacts (NH3)	Ammonia: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
68	Freshwater	Groundwater	Groundwater scheme - human health impacts (PM rural)	PM rural: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
69	Freshwater	Groundwater	Groundwater scheme - carbon emissions	Carbon price (non-traded) in £ per tonne											
70	Freshwater	Groundwater	Groundwater - power (thermoelectric)	Value of groundwater used for thermoelectric uses											

71	Freshwater	Groundwater	Groundwater - damage to all property at risk	Weighted annual average damages for all properties at risk											
72	Freshwater	Groundwater	Groundwater - damage per property (no protection)	Weighted annual average damages per property (no protection)											
73	Freshwater	Groundwater	Groundwater - 1 in 2 (flooding)	Weighted annual average damages - 1 in 2											
74	Freshwater	Groundwater	Groundwater - 1 in 5 (flooding)	Weighted annual average damages - 1 in 5											
75	Freshwater	Groundwater	Groundwater - 1 in 10 (flooding)	Weighted annual average damages - 1 in 10											
76	Freshwater	Groundwater	Groundwater - 1 in 25 (flooding)	Weighted annual average damages - 1 in 25											
77	Freshwater	Groundwater	Groundwater - 1 in 50 (flooding)	Weighted annual average damages - 1 in 50											
78	Freshwater	Groundwater	Groundwater - 1 in 100 (flooding)	Weighted annual average damages - 1 in 100											
79	Freshwater	Groundwater	Groundwater - 1 in 200 (flooding)	Weighted annual average damages - 1 in 200											
80	Freshwater	Groundwater	Groundwater - flood control	Willingness to pay for flood control	Y	Y	Y		Y	Y	Y				Y
81	Freshwater	Groundwater	Groundwater - nitrate contamination (protection)	Protection of groundwater from nitrate contamination	Y	Y	Y		Y	Y	Y				Y
82	Freshwater	Groundwater	Groundwater - nitrate contamination (reduce/stabilise)	Reduction or stabilisation of nitrate levels between 0.5-1mg/litre	Y	Y	Y		Y	Y	Y				Y

83	Freshwater	Groundwater	Groundwater - protection (general)	Willingness to pay for increased protection for naturally clean groundwater (Denmark)											
84	Freshwater	Groundwater	Groundwater - nitrate (land use change)	Cost of changing land use to reduce nitrate loading of groundwater	Y	Y	Y		Y	Y	Y				Y
85	Freshwater	Groundwater	Groundwater - protection (general)	Average cost of groundwater protection (Germany)	Y	Y	Y		Y	Y	Y				Y
86	Freshwater	Groundwater	Groundwater - protection (all pollutants)	Value of pure water based on elimination of all pollutants (France)	Y	Y	Y		Y	Y	Y				Y
87	Freshwater	Groundwater	Groundwater - protection (toxic chemicals)	Willingness to pay to eliminate the risk of toxic chemicals reaching groundwater (New Zealand)	Y	Y	Y		Y	Y	Y				Y
88	Freshwater	Groundwater	Groundwater - low flow alleviation	Willingness to pay for 'general river users' for low flow alleviation									Y		
89	Freshwater	Groundwater	Groundwater scheme - support water birds	Improvement from river not capable of supporting water birds to one that is good enough for water birds				Y					Y		
90	Freshwater	Groundwater	Groundwater scheme - support fish	Improvement from river good enough for water birds to one good enough to support fish				Y					Y		
91	Freshwater	Groundwater	Groundwater scheme - support trout	Improvement from river with good coarse fishery to one able to support trout									Y		
92	Freshwater	Groundwater	Groundwater scheme - support trout	Price premium for proximity to rivers									Y		

93	Freshwater	Groundwater	Groundwater scheme - property	Price premium for water fronting properties based on survey of estate agents											Y
94	Freshwater	Groundwater	Groundwater scheme - recreation (disruption)	Cost per person per year from disruption to recreational activities during works											
95	Freshwater	Groundwater	Groundwater scheme - inland marsh	Valuation of total ecosystem services provided by inland marsh										Y	
96	Freshwater	Groundwater	Groundwater scheme - peat bog	Valuation of total ecosystem services provided by peat bog										Y	
97	Freshwater	Groundwater	Groundwater scheme - saltmarsh	Valuation of total ecosystem services provided by saltmarsh											
98	Freshwater	Groundwater	Groundwater scheme - intertidal mudflats	Valuation of total ecosystem services provided by intertidal mudflats											
99	Freshwater	Groundwater	Groundwater scheme - species loss (high)	Avoid 10% decrease of up to 10 birds and plant species (high)							Y		Y	Y	
100	Freshwater	Groundwater	Groundwater scheme - species loss (low)	Avoid 5% decrease of up to 10 birds and plant species (low)							Y		Y	Y	
101	Freshwater	Groundwater	Groundwater scheme - river flows	Avoid a small decrease in river flows									Y		
102	Freshwater	Groundwater	Groundwater scheme - river flows	Willingness to pay to maintain or improve flow in 40 low flow rivers in England									Y		
103	Habitat provision	Habitat improvement	Inland marsh	Habitat (and ecosystem service) provision through improved water quality										Y	
104	Habitat provision	Habitat improvement	Saltmarsh	Habitat (and ecosystem service) provision through improved water quality											

105	Habitat provision	Habitat improvement	Intertidal mudflat	Habitat (and ecosystem service) provision through improved water quality											
106	Habitat provision	Habitat improvement	Peat bog	Habitat (and ecosystem service) provision through improved water quality										Y	
107	Air quality	Pollutant (air)	NOX Domestic	Damage costs for emission of pollutant into air											Y
108	Air quality	Pollutant (air)	NOX Agriculture	Damage costs for emission of pollutant into air	Y					Y	Y				Y
109	Air quality	Pollutant (air)	NOX Waste	Damage costs for emission of pollutant into air											Y
110	Air quality	Pollutant (air)	NOX Industry	Damage costs for emission of pollutant into air											Y
111	Air quality	Pollutant (air)	NOX ESI	Damage costs for emission of pollutant into air											Y
112	Air quality	Pollutant (air)	SOX	Damage costs for emission of pollutant into air											Y
113	Air quality	Pollutant (air)	PM10 Domestic	Damage costs for emission of pollutant into air											Y
114	Air quality	Pollutant (air)	PM10 Agriculture	Damage costs for emission of pollutant into air	Y					Y	Y				
115	Air quality	Pollutant (air)	PM10 Waste	Damage costs for emission of pollutant into air											Y
116	Air quality	Pollutant (air)	PM10 Industry	Damage costs for emission of pollutant into air											Y
117	Air quality	Pollutant (air)	PM10 ESI	Damage costs for emission of pollutant into air											Y
118	Air quality	Pollutant (air)	Ammonia	Damage costs for emission of pollutant into air						Y	Y				Y
119	Air quality	Pollutant (air)	NOx	Damage costs for emission of pollutant into air											Y
120	Air quality	Pollutant (air)	SO2	Damage costs for emission of pollutant into air											Y
121	Air quality	Pollutant (air)	PM10	Damage costs for emission of pollutant into air											Y

122	Air quality	Pollutant (air)	NH3	Damage costs for emission of pollutant into air						Y	Y				Y
123	Air quality	Pollutant (air)	Arsenic	Damage costs for emission of pollutant into air											Y
124	Air quality	Pollutant (air)	Cadmium	Damage costs for emission of pollutant into air											Y
125	Air quality	Pollutant (air)	Chromium	Damage costs for emission of pollutant into air											Y
126	Air quality	Pollutant (air)	Nickel	Damage costs for emission of pollutant into air											Y
127	Air quality	Pollutant (air)	1, 3 Butadiene	Damage costs for emission of pollutant into air											Y
128	Air quality	Pollutant (air)	Benzene	Damage costs for emission of pollutant into air											Y
129	Air quality	Pollutant (air)	PAH	Damage costs for emission of pollutant into air											Y
130	Air quality	Pollutant (air)	Diesel particulate matter	Damage costs for emission of pollutant into air											Y
131	Air quality	Pollutant (air)	Formaldehyde	Damage costs for emission of pollutant into air											Y
132	Air quality	Pollutant (air)	Dioxins/furans	Damage costs for emission of pollutant into air											Y
133	Habitat - water	Habitat improvement	Blanket bog	Value people are willing to pay to secure gains from current levels under "Improved scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions										Y	

134	Habitat - land	Habitat improvement	Upland heath	Value people are willing to pay to secure gains from current levels under "Improved scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions							Y			Y	
135	Habitat - land	Habitat improvement	Native woodland	Value people are willing to pay to secure gains from current levels under "Improved scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions			Y								
136	Habitat - water	Habitat improvement	Blanket bog	Value people are willing to pay to secure gains from current levels under "Decline scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions										Y	

137	Habitat - land	Habitat improvement	Upland heath	Value people are willing to pay to secure gains from current levels under "Decline scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions							Y			Y	
138	Habitat - land	Habitat improvement	Native woodland	Value people are willing to pay to secure gains from current levels under "Decline scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions			Y								
139	Ecosystem service		Wild food	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y								
140	Ecosystem service		Non-food products	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y		Y			Y			
141	Ecosystem service		Climate regulation	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y		Y			Y			Y

142	Ecosystem service		Water regulation	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
143	Ecosystem service		Sense of place	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
144	Ecosystem service		Charismatic species	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y					Y	Y	Y	
145	Ecosystem service		Non-charismatic species	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
146	Ecosystem service		Wild food	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)		Y	Y								
147	Ecosystem service		Non-food products	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)		Y	Y		Y			Y			

148	Ecosystem service		Climate regulation	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
149	Ecosystem service		Water regulation	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
150	Ecosystem service		Sense of place	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
151	Ecosystem service		Charismatic species	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)		Y	Y					Y	Y	Y	
152	Ecosystem service		Non-charismatic species	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
153	Habitat - land	Habitat improvement	Arable margins	Value of BAP habitat under current spend scenario	Y	Y									

154	Habitat - water	Habitat improvement	Blanket bog	Value of BAP habitat under current spend scenario										Y	
155	Habitat - land	Habitat improvement	Hedgerows	Value of BAP habitat under current spend scenario		Y									
156	Habitat - land	Habitat improvement	Limestone pavement	Value of BAP habitat under current spend scenario								Y			
157	Habitat - land	Habitat improvement	Low calc grassland	Value of BAP habitat under current spend scenario						Y	Y				
158	Habitat - land	Habitat improvement	Low dry acid grass	Value of BAP habitat under current spend scenario						Y	Y				
159	Habitat - land	Habitat improvement	Lowland heath	Value of BAP habitat under current spend scenario						Y	Y				
160	Habitat - land	Habitat improvement	Low hay meadow	Value of BAP habitat under current spend scenario						Y	Y				
161	Habitat - land	Habitat improvement	Purple moor, grass	Value of BAP habitat under current spend scenario						Y	Y				
162	Habitat - land	Habitat improvement	Upland calc grass	Value of BAP habitat under current spend scenario						Y	Y				
163	Habitat - land	Habitat improvement	Upland hay meadow	Value of BAP habitat under current spend scenario						Y	Y				
164	Habitat - land	Habitat improvement	Upland heath	Value of BAP habitat under current spend scenario						Y	Y				
165	Habitat - water	Habitat improvement	Coastal floodplain	Value of BAP habitat under current spend scenario											
166	Habitat - water	Habitat improvement	Fens	Value of BAP habitat under current spend scenario										Y	

167	Habitat - water	Habitat improvement	Lowland raised bog	Value of BAP habitat under current spend scenario										Y	
168	Habitat - water	Habitat improvement	Wet reed beds	Value of BAP habitat under current spend scenario										Y	
169	Habitat - land	Habitat improvement	Native woodland	Value of BAP habitat under current spend scenario			Y								
170	Habitat - land	Habitat improvement	Arable fields	Value of BAP habitat under current spend scenario	Y										
171	Habitat - land	Habitat improvement	Improved grassland	Value of BAP habitat under current spend scenario						Y					
172	Habitat - land	Habitat improvement	Arable margins	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario	Y	Y									
173	Habitat - water	Habitat improvement	Blanket bog	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
174	Habitat - land	Habitat improvement	Hedgerows	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario		Y									
175	Habitat - land	Habitat improvement	Limestone pavement	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario								Y			
176	Habitat - land	Habitat improvement	Low calc grassland	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				

177	Habitat - land	Habitat improvement	Low dry acid grass	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
178	Habitat - land	Habitat improvement	Lowland heath	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
179	Habitat - land	Habitat improvement	Low hay meadow	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
180	Habitat - land	Habitat improvement	Purple moor, grass	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
181	Habitat - land	Habitat improvement	Upland calc grass	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
182	Habitat - land	Habitat improvement	Upland hay meadow	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
183	Habitat - land	Habitat improvement	Upland heath	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				

184	Habitat - water	Habitat improvement	Coastal floodplain	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario											
185	Habitat - water	Habitat improvement	Fens	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
186	Habitat - water	Habitat improvement	Lowland raised bog	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
187	Habitat - water	Habitat improvement	Wet reed beds	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
188	Habitat - land	Habitat improvement	Native woodland	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario			Y								
189	Habitat - land	Habitat improvement	Arable fields	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario	Y										
190	Habitat - land	Habitat improvement	Improved grassland	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y					
191	Water purification and waste treatment	Pollutant (water)	Nitrate	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y

192	Water purification and waste treatment	Pollutant (water)	Phosphorus	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y
193	Water purification and waste treatment	Pollutant (water)	Sediment	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y
194	Water purification and waste treatment	Pollutant (water)	Ammonia	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y
195	Water purification and waste treatment	Pollutant (water)	Methane	Value for environmental benefit per unit pollutant emission reduced	Y					Y	Y			Y	Y
196	Water purification and waste treatment	Pollutant (water)	Nitrous oxide	Value for environmental benefit per unit pollutant emission reduced											Y
197	Water purification and waste treatment	Pollutant (water)	Energy use	Value for environmental benefit per unit pollutant emission reduced											
198	Water purification and waste treatment	Pollutant (water)	Pesticides	Value for environmental benefit per unit pollutant emission reduced											
199	Water purification and waste treatment	Pollutant (water)	FIOs	Value for environmental benefit per unit pollutant emission reduced											
200	Aesthetics	Marine (aesthetics)	Avoiding presence of litter / dog mess	Avoiding presence of litter / dog mess	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

201	Water purification and waste treatment	Habitat improvement	Improved bathing water quality - human health	Valuation relates to the benefits of a 1% reduction in the risk of illness for recreational users of coastal bathing waters. Improvements in bathing water quality are associated with attaining sufficient status under the EU revised Bathing Water Directive (rBWD).											
202	Habitat - water	Habitat creation	Wetland	1. Valuations are based on 10 ha increase in wetland area 2. Valuations are based on an increase in the extent of saltmarsh of approx. 1,000 – 2,000 ha.										Y	
203	Aesthetics	Property prices	Property value - proximity to landfill	Property value reduction depending on proximity to landfill site											Y
204	Food	Agriculture	Value of crops (enclosed farmland)	Value per tonne of crop	Y										
205	Food	Agriculture	Value livestock (enclosed farmland)	Value per head of livestock						Y	Y				
206	Recreation - land	Habitat (recreation)	Recreation - enclosed farmland	Value per visit to sites for informal recreation activities (e.g. walking, dog-walking, picnics) i.e. not specialist	Y					Y	Y				
207	Food	Aquaculture	Value of rainbow trout	Value per tonne of commercial rainbow trout									Y		
208	Recreation - water	Habitat (recreation)	Recreation - freshwater, wetlands and floodplains	Value per visit				Y					Y	Y	
209	Food	Aquaculture	Value of fish landings	Value per tonne of fish (first sale value)											
210	Recreation - water	Habitat (recreation)	Recreation - marine	Value per visit											
211	Recreation - land	Habitat (recreation)	Recreation - mountains, moors and heaths	Value per visit											
212	Habitat - land	Habitat creation	Peat bog	Valuation based on 10 ha increase in wetland area										Y	

213	Food	Agriculture	Value of crop (semi-natural grassland)	Value per head of livestock						Y	Y				
214	Recreation - land	Habitat (recreation)	Recreation - semi-natural grassland	Value per visit						Y	Y				
215	Aesthetics	Urban (aesthetics)	Aesthetics - urban (green space)	Value per hectare of urban green space											Y
216	Recreation - land	Habitat (recreation)	Recreation - urban (green space)	Value per visit											Y
217	Fibre	Forestry (fibre)	Timber provision	Value of timber provision			Y								
218	Recreation - land	Habitat (recreation)	Recreation - woodland	Value per visit			Y								
219	Freshwater	Provision of water	Combined water and sewerage provision - households	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y	Y	
220	Freshwater	Provision of water	Sewerage only - households	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y	Y	
221	Freshwater	Provision of water	Combined water and sewerage provision - businesses	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y	Y	

222	Freshwater	Provision of water	Sewerage only - businesses	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
223	Freshwater	Provision of water	Combined water and sewerage provision - households	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
224	Freshwater	Provision of water	Sewerage only - households	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
225	Freshwater	Provision of water	Combined water and sewerage provision - businesses	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
226	Freshwater	Provision of water	Sewerage only - businesses	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		

227	Freshwater	Provision of water	Discolouration/taste & smell - households	Unit valuations of service attributes				Y					Y		
228	Freshwater	Provision of water	Discolouration/taste & smell - businesses	Unit valuations of service attributes				Y					Y		
229	Freshwater	Provision of water	Discolouration/taste & smell - all customers	Unit valuations of service attributes				Y					Y		
230	Freshwater	Provision of water	Short interruptions - households	Unit valuations of service attributes											Y
231	Freshwater	Provision of water	Short interruptions - businesses	Unit valuations of service attributes											Y
232	Freshwater	Provision of water	Short interruptions - all customers	Unit valuations of service attributes											Y
233	Freshwater	Provision of water	Hosepipe bans (H/IOW) - households	Unit valuations of service attributes					Y						Y
234	Freshwater	Provision of water	Hosepipe bans (H/IOW) - businesses	Unit valuations of service attributes					Y						Y
235	Freshwater	Provision of water	Hosepipe bans (H/IOW) - all customers	Unit valuations of service attributes					Y						Y
236	Freshwater	Provision of water	Hosepipe bans (K/S) - households	Unit valuations of service attributes					Y						Y
237	Freshwater	Provision of water	Hosepipe bans (K/S) - businesses	Unit valuations of service attributes					Y						Y
238	Freshwater	Provision of water	Hosepipe bans (K/S) - all customers	Unit valuations of service attributes					Y						Y
239	Freshwater	Provision of water	Rota cuts - households	Unit valuations of service attributes											Y
240	Freshwater	Provision of water	Rota cuts - businesses	Unit valuations of service attributes											Y
241	Freshwater	Provision of water	Rota cuts - all customers	Unit valuations of service attributes											Y
242	Freshwater	Provision of water	Long term stoppages - households	Unit valuations of service attributes											Y
243	Freshwater	Provision of water	Long term stoppages - businesses	Unit valuations of service attributes											Y
244	Freshwater	Provision of water	Long term stoppages - all customers	Unit valuations of service attributes											Y
245	Freshwater	Provision of water	Internal sewer flooding - households	Unit valuations of service attributes											Y
246	Freshwater	Provision of water	Internal sewer flooding - businesses	Unit valuations of service attributes											Y
247	Freshwater	Provision of water	Internal sewer flooding - all customers	Unit valuations of service attributes											Y
248	Freshwater	Provision of water	External sewer flooding - households	Unit valuations of service attributes											Y
249	Freshwater	Provision of water	External sewer flooding - businesses	Unit valuations of service attributes											Y
250	Freshwater	Provision of water	External sewer flooding - all customers	Unit valuations of service attributes											Y

251	Freshwater	Provision of water	Odour from sewage works - households	Unit valuations of service attributes											Y
252	Freshwater	Provision of water	Odour from sewage works - businesses	Unit valuations of service attributes											Y
253	Freshwater	Provision of water	Odour from sewage works - all customers	Unit valuations of service attributes											Y
254	Freshwater	Provision of water	Pollution incidents - households	Unit valuations of service attributes				Y					Y	Y	
255	Freshwater	Provision of water	Pollution incidents - businesses	Unit valuations of service attributes				Y					Y	Y	
256	Freshwater	Provision of water	Pollution incidents - all customers	Unit valuations of service attributes				Y					Y	Y	
257	Freshwater	Provision of water	River water quality - households	Unit valuations of service attributes									Y		
258	Freshwater	Provision of water	River water quality - businesses	Unit valuations of service attributes									Y		
259	Freshwater	Provision of water	River water quality - all customers	Unit valuations of service attributes									Y		
260	Freshwater	Provision of water	Bathing water quality - households	Unit valuations of service attributes										Y	
261	Freshwater	Provision of water	Bathing water quality - businesses	Unit valuations of service attributes										Y	
262	Freshwater	Provision of water	Bathing water quality - all customers	Unit valuations of service attributes										Y	
263	Freshwater	Provision of water	Discoloured water - household	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
264	Freshwater	Provision of water	Supply interruptions - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y

265	Freshwater	Provision of water	Hosepipe bans - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)					Y						Y
266	Freshwater	Provision of water	Persistent low pressure - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
267	Freshwater	Provision of water	Discoloured water - household	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
268	Freshwater	Provision of water	Supply interruptions - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y

269	Freshwater	Provision of water	Hosepipe bans - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)					Y						Y
270	Freshwater	Provision of water	Persistent low pressure - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
271	Freshwater	Provision of water	Discoloured water - household	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
272	Freshwater	Provision of water	Supply interruptions - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y

273	Freshwater	Provision of water	Hosepipe bans - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)					Y						Y
274	Freshwater	Provision of water	Persistent low pressure - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
275	Freshwater	Provision of water	Discoloured water - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
276	Freshwater	Provision of water	Supply interruptions - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y

277	Freshwater	Provision of water	Hosepipe bans - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)					Y						Y
278	Freshwater	Provision of water	Persistent low pressure - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
279	Freshwater	Provision of water	Discoloured water - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
280	Freshwater	Provision of water	Supply interruptions - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y

281	Freshwater	Provision of water	Hosepipe bans - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)					Y						Y
282	Freshwater	Provision of water	Persistent low pressure - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
283	Freshwater	Provision of water	Discoloured water - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
284	Freshwater	Provision of water	Supply interruptions - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y

285	Freshwater	Provision of water	Hosepipe bans - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)					Y						Y
286	Freshwater	Provision of water	Persistent low pressure - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
287	Freshwater	Provision of water	Discoloured water - households	Unit Values for Service Measures											Y
288	Freshwater	Provision of water	Hosepipe bans - households	Unit Values for Service Measures					Y						Y
289	Freshwater	Provision of water	Persistent low pressure - households	Unit Values for Service Measures											Y
290	Freshwater	Provision of water	Supply interruptions - households	Unit Values for Service Measures											Y
291	Freshwater	Provision of water	Discoloured water - businesses	Unit Values for Service Measures											Y
292	Freshwater	Provision of water	Hosepipe bans - businesses	Unit Values for Service Measures					Y						Y
293	Freshwater	Provision of water	Persistent low pressure - businesses	Unit Values for Service Measures											Y
294	Freshwater	Provision of water	Supply interruptions - businesses	Unit Values for Service Measures											Y
295	Freshwater	Provision of water	Discoloured water - all customers	Unit Values for Service Measures											Y
296	Freshwater	Provision of water	Hosepipe bans - all customers	Unit Values for Service Measures					Y						Y
297	Freshwater	Provision of water	Persistent low pressure - all customers	Unit Values for Service Measures											Y
298	Freshwater	Provision of water	Supply interruptions - all customers	Unit Values for Service Measures											Y
299	Habitat - water	Habitat creation	Inland marsh	Willingness to pay for creation/improvement of inland marsh habitat										Y	

300	Biodiversity	Biodiversity	Biodiversity preservation	Benefits from biodiversity	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
301	Recreation - land	Activity (recreation)	Walking/cycling	Use of green space for walking and cycling	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
302	Recreation - water	Habitat (recreation)	Recreation - wetlands	Recreational benefits from constructed wetlands				Y						Y	
303	Recreation - land	Habitat (recreation)	Recreation - forests	Value per visit to forest with limited access/amenities			Y								
304	Recreation - land	Activity (recreation)	Angling (coarse)	Willingness to pay for additional angling visit (coarse)				Y					Y	Y	
305	Recreation - land	Activity (recreation)	Angling (game)	Willingness to pay for additional angling visit (game)				Y					Y		
306	Recreation - land	Activity (recreation)	Nature watching	Willingness to pay for additional visit for nature watchers visiting forests	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
307	Recreation - land	Habitat (recreation)	Recreation - grasslands	Value of general recreational visit						Y	Y				
308	Recreation - water	Habitat (recreation)	Recreation - freshwater and floodplains	Value of general recreational visit				Y					Y	Y	
309	Recreation - land	Habitat (recreation)	Recreation - greenbelt and urban fringe	Value of general recreational visit	Y	Y	Y		Y	Y	Y				Y
310	Aesthetics	Urban (aesthetics)	Aesthetics - street greening	Value to residents for street improvement through planting of small/large trees and green verges along the street (low value for small trees, med value for large trees, high value for large trees and planting)		Y									Y
311	Aesthetics	Urban (aesthetics)	Aesthetics - increase area of local ponds	Value to residents of increasing the area of local ponds										Y	Y
312	Aesthetics	Property prices	Property value increase - green space	Increase in property prices for 1% increase in green space share of land use	Y	Y	Y		Y	Y	Y				Y
313	Aesthetics	Property prices	Property value increase - area of local ponds	Increase in property prices for 1% increase in water share of land use										Y	
314	Aesthetics	Urban (aesthetics)	Aesthetics - increase area of local ponds	Value to households of increasing the area of local ponds										Y	

315	Aesthetics	Property prices	Property price premium (detached) - city park	Average property value premium for a detached house within 450m of city park					Y						
316	Aesthetics	Property prices	Property price premium (flat) - city park	Average property value premium for a flat within 450m of city park					Y						
317	Aesthetics	Property prices	Property price premium (non-detached) - city park	Average property value premium for a non-detached house within 450m of city park					Y						
318	Aesthetics	Property prices	Property price premium (detached) - local park	Average property value premium for a detached house within 450m of local park					Y						
319	Aesthetics	Property prices	Property price premium (flat) - local park	Average property value premium for a flat within 450m of local park					Y						
320	Aesthetics	Property prices	Property price premium (non-detached) - local park	Average property value premium for a non-detached house within 450m of local park					Y						
321	Aesthetics	Property prices	Property price premium (detached) - green space	Average property value premium for a detached house within 450m of green space		Y	Y		Y						
322	Aesthetics	Property prices	Property price premium (flat) - green space	Average property value premium for a flat within 450m of green space		Y	Y		Y						
323	Aesthetics	Property prices	Property price premium (non-detached) - green space	Average property value premium for a non-detached house within 450m of green space		Y	Y		Y						
324	Flooding	Damage costs (Flooding)	Damage costs to property at risk of flooding	Average damage costs to property from flooding											
325	Flooding	Damage costs (Flooding)	Economic cost of flooding - residential	Average insurance claim for residential property (2007 floods)											
326	Flooding	Damage costs (Flooding)	Economic cost of flooding - commercial	Average insurance claim for commercial property (2007 floods)											

327	Flooding	Damage costs (Flooding)	Economic cost of flooding - schools	Value of a school day lost as a result of flooding											
328	Flooding	Damage costs (Flooding)	Economic cost of flooding - electricity	Value of avoiding electricity disruption as a result of flooding											
329	Flooding	Damage costs (Flooding)	Economic cost of flooding - water supply	Value of avoiding interruptions to water supply as a result of flooding											
330	Flooding	Damage costs (Flooding)	Economic costs of flooding - agricultural land (arable)	Flood damage to arable agricultural land (2007 floods)											
331	Flooding	Damage costs (Flooding)	Economic costs of flooding - agricultural land (grassland/livestock)	Flood damage to grassland/livestock agricultural land (2007 floods)											
332	Flooding	Damage costs (Flooding)	Economic costs of flooding - working days	Value of working time using average hourly wage											
333	Flooding	Reduce/remove risk (flooding)	Reduce internal sewer flooding - residential	Reduce internal sewer flooding by 1 incident to 1 property (residential)											
334	Flooding	Reduce/remove risk (flooding)	Reduce external sewer flooding - residential	Reduce external sewer flooding by 1 incident to 1 property (residential)											
335	Flooding	Reduce/remove risk (flooding)	Reduce internal sewer flooding - commercial	Reduce internal sewer flooding by 1 incident to 1 property (commercial)											
336	Flooding	Reduce/remove risk (flooding)	Reduce external sewer flooding - commercial	Reduce external sewer flooding by 1 incident to 1 property (commercial)											
337	Flooding	Reduce/remove risk (flooding)	Reduce internal flooding - residential	Reduce internal flooding to 1 property (residential)											
338	Flooding	Reduce/remove risk (flooding)	Reduce internal flooding - commercial	Reduce internal flooding to 1 property (commercial)											
339	Freshwater	Groundwater	Groundwater - long run marginal costs (water companies)	Water and wastewater treatment savings from direct groundwater abstraction											

340	Freshwater	Groundwater	Groundwater - replacement cost	Water replacement cost based on the sale price of domestic water supply divided by a factor representing all abstraction and processing costs for a hybrid site in the East Midlands											
341	Freshwater	Groundwater	Groundwater - abstraction and treatment	Marginal values from Scottish Government for abstraction and treatment of groundwater for households											
342	Freshwater	Groundwater	Groundwater - industrial abstraction	Savings to industry from direct abstraction. Direct industrial abstraction of groundwater based on market price of alternative water supply less other costs included.											
343	Aesthetics	Property prices	Property value increase - city park enhancement	Average property value increase following city park enhancement					Y						
344	Aesthetics	Property prices	Property value increase - local park enhancement	Average property value increase following local park enhancement					Y						
345	Aesthetics	Property prices	Property value increase - green space enhancement	Average property value increase following green space enhancement		Y	Y		Y						
346	Aesthetics	Property prices	Property value increase - city park creation	Average property value increase following city park creation					Y						
347	Aesthetics	Property prices	Property value increase - local park creation	Average property value increase following local park creation					Y						
348	Aesthetics	Property prices	Property value increase - green space creation	Average property value increase following green space creation		Y	Y		Y						
349	Recreation	Expenditure (recreation)	Expenditure per person - day	NW average expenditure per person - day	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

350	Recreation	Expenditure (recreation)	Expenditure per person - night	NW average expenditure per person - overnight	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
351	Recreation - land	Activity (recreation)	Hill walking	Value per visit	Y	Y	Y			Y	Y	Y			
352	Recreation - land	Activity (recreation)	Casual walking	Value per visit (average visit is 6 hours)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
353	Recreation - water	Activity (recreation)	Freshwater angling	Willingness to pay for coarse fishing in and around Leeds				Y					Y	Y	
354	Recreation - land	Activity (recreation)	Bird watching	Willingness to pay of nature watchers visiting forests	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
355	Recreation - land	Activity (recreation)	Game shooting	Willingness to pay to avoid loss of deer to shoot	Y		Y			Y	Y				
356	Recreation - land	Activity (recreation)	Cycling	Willingness to pay per person	Y		Y	Y		Y	Y		Y		Y
357	Recreation - land	Activity (recreation)	Horse riding	Willingness to pay per person	Y		Y			Y	Y				
358	Recreation - land	Habitat (recreation)	Woodland visit (local up to 10 miles)	Value of general recreational visit			Y								
359	Recreation - water	Activity (recreation)	Rutland Water (multiple uses)	Made up of travel costs £9.40 and 16.10 for time										Y	
360	Recreation - land	General use (recreation)	General park use	General use of park (playgrounds, trails, dog walking)					Y						
361	Recreation - land	General use (recreation)	Green space use	Average value of leisure time (walking and cycling) - based on time spent at location and value of time	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
362	Recreation - land	Expenditure (recreation)	Expenditure during visits to natural environment	Average expenditure during visits to the natural environment	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
363	Recreation - land	Expenditure (recreation)	Expenditure during visits to nature reserve	Estimated visitor spending to the local economy within 20 miles of the RSPB Leighton Moss reserve and neighbouring sites in Silverdale, Lancashire			Y	Y		Y	Y		Y	Y	
364	Recreation - land	Habitat (recreation)	Recreation - nature reserve	Value of access to Wren's Nest National Nature Reserve											
365	Recreation - land	Expenditure (recreation)	Expenditure during visits to nature reserve	Estimated visitor spending to the local economy (Forest of Dean) of the Symond's Yat Rock reserve in Gloucestershire											

366	Recreation - water	Activity (recreation)	Trout and salmon fishing	Value willing to pay for river habitat improvements that significantly improve the quality and quantity of trout and salmon in the River Wye				Y					Y	Y	
367	Recreation - land	Habitat (recreation)	Recreation - natural environment	Average value of access to the Jurassic Coast with interpretive material								Y			
368	Recreation - land	Habitat (recreation)	Recreation - natural environment	Average value of recreational visit to silverstrand Beach, near Galway (Ireland)											
369	Recreation - land	Activity (recreation)	Walking (lowlands)	Average value of access to improved site (lowland)	Y	Y	Y	Y	Y	Y	Y		Y	Y	
370	Recreation - land	Activity (recreation)	Walking (highlands)	Average value of access to improved site (highland)		Y	Y			Y	Y	Y	Y	Y	
371	Habitat - water	Habitat creation	Water-dependent habitat created	Value of water-dependent habitat created				Y					Y	Y	
372	Habitat - water	Habitat creation	Intertidal habitat created	Value of net intertidal habitat created											
373	Habitat - water	Habitat creation	Protected river improved	Value of protected river improved									Y		
374	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved river quality	Willingness to pay for improving river quality through removal of litter and filling channel with water for informal recreation									Y		
375	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved river quality	Willingness to pay for improving river quality through the creation of new meanders, bankside planting and some habitat creation for informal recreation									Y		
376	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved river quality	Willingness to pay for improving river quality through river restoration through channel modifications, habitat creation and landscaping for informal recreation									Y		

377	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flows every 4 or 5 years out of 20 years to full restoration to low flows once every 20 years for informal recreation									Y		
378	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flow conditions to environmentally acceptable flow regime in River Darent for informal recreation									Y		
379	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flow conditions to full restoration of River Avon at Malmesbury for informal recreation									Y		
380	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flow conditions to full restoration of River Tavy at Tavistock for informal recreation									Y		
381	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from current level of abstraction to 5cm increase in water levels for informal recreation									Y	Y	
382	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 5cm decrease in water levels for informal recreation									Y	Y	
383	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 45cm decrease in water levels for informal recreation									Y	Y	

384	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 1m decrease in water levels for informal recreation									Y	Y	
385	Recreation - water	Habitat improvement (recreation)	Birdwatching - improved wetlands	Value for improving wetland to support birds (for birdwatching)				Y					Y	Y	
386	Recreation - water	Habitat improvement (recreation)	Birdwatching - improved wetlands	Value for provision of birdwatching at different inland wetland sites (Tudeley Woods, Weir Woods and Pulborough Brooks)				Y					Y	Y	
387	Recreation - water	Habitat improvement (recreation)	Birdwatching - improved wetlands	Willingness to pay for the protection of site quality and characteristics against future damage and loss of birdwatching and habitat				Y					Y	Y	
388	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Willingness to pay for creation of poor quality fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2)				Y					Y	Y	
389	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Willingness to pay for creation of moderate quality fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2)				Y					Y	Y	
390	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Willingness to pay for creation of good quality fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2)				Y					Y	Y	
391	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Marginal value to improve fishery quality from no fishery to poor quality				Y					Y	Y	
392	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Marginal value to improve fishery from poor quality to moderate quality				Y					Y	Y	

393	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Marginal value to improve fishery from moderate quality to good quality				Y					Y	Y	
394	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Willingness to pay for creation of poor quality trout fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2)									Y		
395	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Willingness to pay for creation of moderate quality trout fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2)									Y		
396	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Willingness to pay for creation of good quality trout fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2)									Y		
397	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Marginal value to improve trout fishery quality from no fishery to poor quality									Y		
398	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Marginal value to improve trout fishery from poor quality to moderate quality									Y		
399	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Marginal value to improve trout fishery from moderate quality to good quality									Y		
400	Recreation - water	Habitat improvement (recreation)	Angling (salmon) - improved water quality	Willingness to pay for creation of a new, good quality salmon fishery, where an average angler has a 1 in 10 chance of catching a salmon each day									Y		
401	Recreation - water	Habitat improvement (recreation)	Angling - improved flows/levels	Willingness to pay to reinstate fishery				Y					Y	Y	
402	Recreation - water	Habitat improvement (recreation)	Angling - improved flows/levels	Willingness to pay to improve flows and thus increase number of angling days in June, July and August (club anglers)				Y					Y	Y	

403	Recreation - water	Habitat improvement (recreation)	Angling - improved flows/levels	Willingness to pay to improve flows and thus increase number of angling days in June, July and August (syndicate members)				Y					Y	Y	
404	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery in England				Y					Y	Y	
405	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery in Wales				Y					Y	Y	
406	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery in Scotland				Y					Y	Y	
407	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery				Y					Y	Y	
408	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery				Y					Y	Y	
409	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for improving coarse fishery quality from no fishery to poor				Y					Y	Y	
410	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for improving coarse fishery quality from poor quality to moderate quality				Y					Y	Y	
411	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for improving coarse fishery quality from moderate quality to good quality				Y					Y	Y	
412	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent marginal value for improving coarse fishery quality from no fishery to poor				Y					Y	Y	
413	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent marginal value for improving coarse fishery quality from poor quality to moderate quality				Y					Y	Y	
414	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent marginal value for improving coarse fishery quality from moderate quality to good quality				Y					Y	Y	
415	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishery in England									Y		

416	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishery in Wales								Y		
417	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishery in Scotland								Y		
418	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stocked water								Y		
419	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in wild fisheries in lowland rivers								Y		
420	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in wild fisheries upland waters								Y		
421	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (2 to 6 fish)								Y		
422	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (2 fish)								Y		
423	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (1 to 2 fish)								Y		
424	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (seasonal let of a site to an angling club)								Y		
425	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for improving trout fishery quality from no fishery to poor								Y		
426	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for improving trout fishery quality from poor quality to moderate quality								Y		
427	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for improving trout fishery quality from moderate quality to good quality								Y		
428	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent marginal value for improving trout fishery quality from no fishery to poor								Y		

429	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent marginal value for improving trout fishery quality from poor quality to moderate quality									Y		
430	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent marginal value for improving trout fishery quality from moderate quality to good quality									Y		
431	Recreation - water	Habitat improvement (recreation)	Instream recreation - improved water quality	Value for improvement to canal to make boating possible				Y							
432	Recreation - water	Habitat improvement (recreation)	Instream recreation - improved water quality	Value to maintain the UK canal network in a state fit to support boating activities				Y							
433	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Small improvement in river quality from RE5 to RE4									Y		
434	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Medium improvement in river quality from RE5 to RE3 (top)									Y		
435	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Large improvement in river quality from RE5 to RE1									Y		
436	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	1% increase in dissolved oxygen saturation									Y		
437	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	1mg/litre decrease in BOD									Y		
438	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	1mgN/lire decrease in total ammonia									Y		
439	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Improve river water quality from poor quality (RE5) to medium quality (RE4/3)									Y		
440	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Improve river water quality from medium quality (RE4/3) to good quality (RE2/1)									Y		
441	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Value to alleviate low flow in river (non-river users)									Y		

442	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay for improvement from current level of abstraction to 5cm increase in water levels for informal recreation (users and non users)									Y	Y	
443	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 5cm decrease in water levels for informal recreation (users and non users)									Y	Y	
444	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 45cm decrease in water levels for informal recreation (users and non users)									Y	Y	
445	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 1m decrease in water levels for informal recreation (users and non users)									Y	Y	
446	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Alleviation of low flow across 40 priority rivers in England (residents)									Y		
447	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Alleviation of low flow across 40 priority rivers in England (general public)									Y		
448	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Value for an environmentally acceptable flow regime (residents)				Y					Y		
449	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Value for an environmentally acceptable flow regime (non users)				Y					Y		
450	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Full improvement and return as far as possible to natural state across 30 worst affected rivers in Thames region									Y		

451	Natural hazard regulation	Flood prevention	Prevention of extreme events by coastal wetlands (tidal marshes)	Value of prevention of extreme events provided by coastal wetlands (tidal marshes)											
452	Genetic resources	Genetic resources	Swamps/marshes genepool	Protecting biodiversity in swamps/marshes										Y	
453	Natural hazard regulation	Flood prevention	Storm protection from tidal marshes	Value of the storm protection provided by tidal marshes											
454	Food	Aquaculture	Fish	Value of fish in the marine environment											
455	Climate regulation	C-sequestration	C-sequestration by the marine environment	Carbon sequestration by the marine environment											
456	Cultural heritage		Cultural heritage of the marine environment	Value of cultural heritage in the marine environment											
457	Recreation - water	Habitat (recreation)	Recreation in the marine environment	Value of recreation in the marine environment											
458	Genetic resources	Genetic resources	Marine genepool	Protecting biodiversity in the marine environment											
459	Nutrient cycling		Nutrient cycling in the marine environment	Value of nutrient cycling in the marine environment											
460	Water purification and waste treatment	Agricultural measures	Reduced river pollutant load	Annualised savings with a 5% reduction in the pollutant load in the Tamar River as part of Tamar 2000	Y					Y	Y				
461	Water purification and waste treatment	Agricultural measures	Reduced pressure on river system	Benefits to river system from farms following good practice advice as part of Tamar 2000	Y					Y	Y				
462	Food	Aquaculture	Sale of fish	Value of fish stocks as a farm diversification as distinct from angling/recreation as part of Tamar 2000											
463	Fuel	Coppicing	Thinning operations and coppicing	Annual benefits from thinning and coppicing operations as part of Tamar 2000			Y								
464	Climate regulation	C-sequestration	C-sequestration through land management changes	Carbon sequestration through land management changes as part of Tamar 2000	Y	Y	Y		Y	Y	Y				

465	Natural hazard regulation	Flood prevention	Flood prevention through removal of woody debris in rivers	Savings (to the Environment Agency) through avoided work as a result of woody debris in the river as part of Tamar 2000											
466	Erosion regulation	Erosion (water)	Erosion regulation - river	Reduced erosion of soil in the Tamar river as part of Tamar 2000									Y		
467	Recreation - water	Habitat improvement (recreation)	Recreation benefits for farms (Tamar 2000)	Recreation/tourism benefits (including fishing, shooting, holiday lets and employment creation) to farms as part of Tamar 2000	Y					Y	Y				
468	Soil formation	Soil formation	Soil formation benefits for farms	Soil formation benefits to farms as part of Tamar 2000 (under-sowing maize crops)	Y					Y	Y				
469	Nutrient cycling		Nutrient cycling from rewetting farmland	Nutrient cycling benefits from rewetting farmland as part of Tamar 2000	Y					Y	Y				
470	Water recycling	Water recycling	Water recycling from Tamar 2000	Water recycling benefits from enhancing the connectivity of land and water as part of Tamar 2000											
471	Habitat provision	Habitat creation	Habitat creation (woodland)	Benefits from habitat creation (woodland) created by farms as part of Tamar 2000			Y								
472	Fibre	Animal (fibre)	Fibre provision (wool)	Value of sheep fleece from Alkborough Flats scheme (minus loss of £5,180 from loss of straw and barley production)						Y	Y				
473	Genetic resources	Genetic resources	Rare breeds (sheep)	Value per head for rare sheep breeds						Y	Y				
474	Climate regulation	C sequestration	C-sequestration by saltwater wetlands	Carbon sequestration by restored mudflat, saltmarsh and reedbed habitat										Y	

475	Natural hazard regulation	Flood prevention	Saltwater wetlands - flood prevention	Value of flood prevention provided by restored mudflat, saltmarsh and reedbed habitat (over 100 years)											
476	Recreation - water	Habitat (recreation)	Recreation - saltwater wetlands	Recreational benefits from Alkborough Flats scheme (excluding informal recreation)											
477	Primary production	Primary production	Saltwater wetlands primary production	Increase to primary production from the replacement of monoculture with complex habitats as part of the Alkborough Flats scheme											
478	Habitat provision	Habitat improvement	Habitat improvement (saltwater wetlands)	Benefits from habitat improvement as part of the Alkborough Flats scheme											
479	Freshwater	Provision of water	Freshwater provision	Freshwater provision from buffer zoning (330m) on the upper Bristol Avon	Y	Y	Y			Y	Y				
480	Food	Agriculture	Food	Value of food provision from buffer zoning (330m) on the upper Bristol Avon	Y	Y				Y	Y				
481	Climate regulation	C sequestration	C-sequestration by riparian buffer	Carbon sequestration from buffer zoning (330m) on the upper Bristol Avon		Y									
482	Erosion regulation	Erosion (water)	Erosion regulation - riparian buffer	Erosion regulation from buffer zoning (330m) on the upper Bristol Avon		Y									
483	Recreation - water	Activity (recreation)	Angling - riparian buffer	Angling from buffer zoning (330m) on the upper Bristol Avon				Y					Y		
484	Tourism	Tourism	Tourism - riparian buffer	Tourism from buffer zoning (330m) on the upper Bristol Avon		Y									
485	Recreation - water	Habitat improvement (recreation)	Informal recreation	Local amenity and informal enjoyment from buffer zoning (330m) on the upper Bristol Avon	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y

486	Cultural heritage	Cultural heritage	Cultural values provided by riparian buffer	Cultural values (largely volunteer activities) from buffer zoning (330m) on the upper Bristol Avon	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
487	Habitat provision	Habitat creation	Habitat creation by riparian buffer	Benefits from habitat creation from buffer zoning (330m) on the upper Bristol Avon		Y							Y		
488	Genetic resources	Genetic resources	Swamps/marshes genepool	Protecting biodiversity in swamps/marshes										Y	
489	Natural hazard regulation	Managed realignment	Saltmarsh	Absolute value of ecosystem services to saltmarsh habitat as part of Wareham managed realignment case study											
490	Natural hazard regulation	Managed realignment	Mudflat	Absolute value of ecosystem services to mudflat habitat as part of Wareham managed realignment case study											
491	Natural hazard regulation	Managed realignment	Reedbed	Absolute value of ecosystem services to reedbed habitat as part of Wareham managed realignment case study										Y	
492	Natural hazard regulation	Managed realignment	Woodland	Absolute value of ecosystem services to woodland habitat as part of Wareham managed realignment case study			Y								
493	Natural hazard regulation	Managed realignment	Heathland	Absolute value of ecosystem services to heathland habitat as part of Wareham managed realignment case study						Y	Y				
494	Natural hazard regulation	Managed realignment	Grazing marsh	Absolute value of ecosystem services to grazing marsh habitat as part of Wareham managed realignment case study						Y	Y				

495	Natural hazard regulation	Managed realignment	Grassland	Absolute value of ecosystem services to grassland habitat as part of Wareham managed realignment case study						Y	Y				
496	Nutrient cycling		Nutrient cycling in the marine environment	Value of nutrient cycling arising from marine protected areas designation in the UK											
497	Climate regulation	Climate regulation	Climate regulation in the marine environment	Climate regulation benefits (not specified) arising from marine protected areas designation in the UK											
498	Food	Aquaculture	Fish	Value of fish arising from marine protected areas designation in the UK											
499	Natural hazard regulation	Flood prevention	Prevention of extreme events by marine environment	Value of prevention of extreme events arising from marine protected areas designation in the UK											
500	Recreation - water	Habitat (recreation)	Recreation - marine environment	Value of recreation arising from marine protected areas designation in the UK											
501	Cultural heritage		Cultural heritage of the marine environment	Value of cultural heritage (unspecified) arising from marine protected areas designation in the UK											
502	Food	Aquaculture	Fish	Value of fish in proposed conservation zone in Lyme Bay											
503	Recreation - water	Activity (recreation)	Hunting / fishing	Value of hunting/fishing (recreational) in proposed conservation zone in Lyme Bay											
504	Recreation - water	Habitat (recreation)	Recreation - open ocean	Value of recreation in proposed conservation zone in Lyme Bay											
505	Natural hazard regulation	Flood prevention	Flood prevention from saltmarsh	Value of flood prevention provided by saltmarsh											

506	Water regulation	Water regulation	Water flows/river discharge by swamps/marshes	Benefits to water regulation provided by swamps/marshes										Y	

Unique Ref	Benefit (high level)	Benefit (medium level)	Benefit (low level)	Change being valued	Relevant habitat types for historic assets										
					Arable land	Boundary features	Broadleaved woodland	Canal	Gardens	Improved grassland	Managed grassland	Natural cave	River	Standing water	Urban
1	Food	Agriculture	Value of crops	Value per tonne of crop	Y										
2	Food	Agriculture	Value of livestock	Value per head of livestock						Y	Y				
3	Freshwater	Provision of water	Public water supply	Value of water for public supply by volume											Y
4	Air quality	Pollutant (air)	PM10 damage cost (Rural)	Damage costs for emission of pollutant into air											Y
5	Air quality	Pollutant (air)	PM10 damage cost (Urban)	Damage costs for emission of pollutant into air											Y
6	Air quality	Pollutant (air)	PM10 damage cost (London)	Damage costs for emission of pollutant into air											Y
7	Air quality	Pollutant (air)	SO2 damage cost (Average)	Damage costs for emission of pollutant into air											Y
8	Habitat - land	Habitat improvement	Mountains, moors and heaths	Value for improvement of mountains, moors and heath habitat											
9	Habitat - land	Habitat improvement	Semi-natural grasslands (SNGL)	Value for improvement of semi-natural grasslands habitat						Y	Y				
10	Habitat - land	Habitat improvement	Enclosed farmland	Value for improvement of enclosed farmland habitat	Y					Y	Y				
11	Habitat - land	Habitat improvement	Woodland	Value for improvement of woodland habitat			Y								
12	Habitat - water	Habitat improvement	Freshwater, wetland and floodplains (OWWF)	Value for improvement of freshwater, wetland and floodplain habitat				Y					Y	Y	
13	Habitat - water	Habitat improvement	Coastal margins	Value for improvement of coastal margin habitat		Y									
14	Recreation - water	Habitat improvement (recreation)	Recreation - river quality improvement (RE4/5 to RE3)	Value of change in river quality from RE4/5 (not capable of supporting water birds) to RE3 (good enough for water birds) for informal recreation				Y					Y		

15	Recreation - water	Habitat improvement (recreation)	Recreation - river quality improvement (RE3/4 to RE2/3)	Value of change in river quality from RE3/4 (good enough for water birds) to RE2/3 (good enough to support fish) for informal recreation				Y					Y		
16	Recreation - water	Habitat improvement (recreation)	Recreation - river quality improvement (RE2 to RE1/2)	Value of change in river quality RE2 (bottom) (good coarse fishery) to RE1/2 (able to support trout) for informal recreation				Y					Y		
17	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within <0.5km of the river concerned				Y					Y		
18	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within 0.5-3.0km of the river concerned				Y					Y		
19	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within 3-12km of the river concerned				Y					Y		
20	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per household within 12-60km of the river concerned				Y					Y		
21	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within <0.5km of the river concerned				Y					Y		
22	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within 0.5-3.0km of the river concerned				Y					Y		
23	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within 3-12km of the river concerned				Y					Y		
24	Recreation - water	Proximity (recreation)	Recreation - proximity to river	Benefits per km of river per household within 12-60km of the river concerned				Y					Y		
25	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
26	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	

27	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
28	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
29	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	
30	Recreation - water	Activity (recreation)	Angling (coarse)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
31	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
32	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	
33	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
34	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (none to poor)				Y					Y	Y	
35	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (poor to moderate)				Y					Y	Y	
36	Recreation - water	Activity (recreation)	Angling (game)	Benefits to angling from improvements to angling quality (moderate to good)				Y					Y	Y	
37	Aesthetics	Property prices	Property price premium - river quality improvement (high)	% premium to property value according to environmental outcome: high impact if environmental impact is from UID or low flow				Y					Y		

38	Aesthetics	Property prices	Property price premium - river quality improvement (medium)	% premium to property value according to environmental outcome: medium impact if change is based on UWWD (reduced eutrophication)				Y					Y		
39	Aesthetics	Property prices	Property price premium - river quality improvement (low)	% premium to property value according to environmental outcome: low impact if changes result from RQO changes as a result of fisheries directive improvements				Y					Y		
40	Recreation - water	Habitat improvement (recreation)	Recreation - beach (average)	Benefits to recreation for improving a beach (average)											
41	Recreation - water	Habitat improvement (recreation)	Recreation - beach (small)	Benefits to recreation for improving a beach (small)											
42	Recreation - water	Habitat improvement (recreation)	Recreation - beach (large)	Benefits to recreation for improving a beach (large)											
43	Water purification and waste treatment	Habitat improvement	River water quality bad to poor	Water quality improvement (bad to poor)				Y					Y		
44	Water purification and waste treatment	Habitat improvement	River water quality poor to moderate	Water quality improvement (poor to moderate)				Y					Y		
45	Water purification and waste treatment	Habitat improvement	River water quality moderate to good	Water quality improvement (moderate to good)				Y					Y		
46	Water purification and waste treatment	Habitat improvement	Coastal, lakes and transitional waters water quality bad to poor	Water quality improvement (bad to poor)											
47	Water purification and waste treatment	Habitat improvement	Coastal, lakes and transitional waters water quality poor to moderate	Water quality improvement (poor to moderate)											
48	Water purification and waste treatment	Habitat improvement	Coastal, lakes and transitional waters water quality moderate to good	Water quality improvement (moderate to good)											

49	Habitat - water	Habitat creation	Low quality wetland created	Low quality wetland created (based on the wetland providing recreation and general non-use social values)										Y	
50	Habitat - water	Habitat creation	Medium quality wetland created	Medium quality wetland created (based on the wetland providing the values for low-value wetland plus water quality services and biodiversity enhancement)										Y	
51	Habitat - water	Habitat creation	High quality wetland created	High quality wetland created (based on the wetland providing the values for low-value wetland plus flood water storage, passive values)										Y	
52	Freshwater	Groundwater	Groundwater - long run marginal costs (water companies)	Water and wastewater treatment savings from direct groundwater abstraction											
53	Freshwater	Groundwater	Groundwater - industry (pulp and paper)	Value of groundwater for pulp and paper industry											
54	Freshwater	Groundwater	Groundwater - industry (chemical)	Value of groundwater for chemical industry											
55	Freshwater	Groundwater	Groundwater - industry (general)	Value of groundwater for general industry											
56	Freshwater	Groundwater	Groundwater - industrial abstraction	Savings to industry from direct abstraction. Direct industrial abstraction of groundwater based on market price of alternative water supply less other costs included.											

57	Freshwater	Groundwater	Groundwater - abstraction and treatment	Marginal values from Scottish Government for abstraction and treatment of groundwater for households											
58	Freshwater	Groundwater	Groundwater - replacement cost	Water replacement cost based on the sale price of domestic water supply divided by a factor representing all abstraction and processing costs for a hybrid site in the East Midlands											
59	Freshwater	Groundwater	Groundwater - irrigation (potatoes)	Value of water for irrigation, based on yield and quality benefits for potatoes	Y										
60	Freshwater	Groundwater	Groundwater - irrigation (carrots)	Value of water for irrigation, based on yield and quality benefits for carrots	Y										
61	Freshwater	Groundwater	Groundwater - irrigation (parsnips)	Value of water for irrigation, based on yield and quality benefits for parsnips	Y										
62	Freshwater	Groundwater	Groundwater - irrigation (leeks)	Value of water for irrigation, based on yield and quality benefits for leeks	Y										
63	Freshwater	Groundwater	Groundwater - irrigation (salad onions)	Value of water for irrigation, based on yield and quality benefits for salad onions	Y										
64	Freshwater	Groundwater	Groundwater - aquaculture	Scottish market values for aquaculture abstraction of groundwater											

65	Freshwater	Groundwater	Groundwater scheme - human health impacts (NOx)	NOx: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
66	Freshwater	Groundwater	Groundwater scheme - human health impacts (SOx)	SOx: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
67	Freshwater	Groundwater	Groundwater scheme - human health impacts (NH3)	Ammonia: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
68	Freshwater	Groundwater	Groundwater scheme - human health impacts (PM rural)	PM rural: Human health impacts from transport emissions (direct) and grid electricity (indirect). For more detail, see http://www.defra.gov.uk/environment/quality/air/airquality/economic/damage/											
69	Freshwater	Groundwater	Groundwater scheme - carbon emissions	Carbon price (non-traded) in £ per tonne											
70	Freshwater	Groundwater	Groundwater - power (thermoelectric)	Value of groundwater used for thermoelectric uses											

71	Freshwater	Groundwater	Groundwater - damage to all property at risk	Weighted annual average damages for all properties at risk											
72	Freshwater	Groundwater	Groundwater - damage per property (no protection)	Weighted annual average damages per property (no protection)											
73	Freshwater	Groundwater	Groundwater - 1 in 2 (flooding)	Weighted annual average damages - 1 in 2											
74	Freshwater	Groundwater	Groundwater - 1 in 5 (flooding)	Weighted annual average damages - 1 in 5											
75	Freshwater	Groundwater	Groundwater - 1 in 10 (flooding)	Weighted annual average damages - 1 in 10											
76	Freshwater	Groundwater	Groundwater - 1 in 25 (flooding)	Weighted annual average damages - 1 in 25											
77	Freshwater	Groundwater	Groundwater - 1 in 50 (flooding)	Weighted annual average damages - 1 in 50											
78	Freshwater	Groundwater	Groundwater - 1 in 100 (flooding)	Weighted annual average damages - 1 in 100											
79	Freshwater	Groundwater	Groundwater - 1 in 200 (flooding)	Weighted annual average damages - 1 in 200											
80	Freshwater	Groundwater	Groundwater - flood control	Willingness to pay for flood control	Y	Y	Y		Y	Y	Y				Y
81	Freshwater	Groundwater	Groundwater - nitrate contamination (protection)	Protection of groundwater from nitrate contamination	Y	Y	Y		Y	Y	Y				Y
82	Freshwater	Groundwater	Groundwater - nitrate contamination (reduce/stabilise)	Reduction or stabilisation of nitrate levels between 0.5-1mg/litre	Y	Y	Y		Y	Y	Y				Y

83	Freshwater	Groundwater	Groundwater - protection (general)	Willingness to pay for increased protection for naturally clean groundwater (Denmark)											
84	Freshwater	Groundwater	Groundwater - nitrate (land use change)	Cost of changing land use to reduce nitrate loading of groundwater	Y	Y	Y		Y	Y	Y				Y
85	Freshwater	Groundwater	Groundwater - protection (general)	Average cost of groundwater protection (Germany)	Y	Y	Y		Y	Y	Y				Y
86	Freshwater	Groundwater	Groundwater - protection (all pollutants)	Value of pure water based on elimination of all pollutants (France)	Y	Y	Y		Y	Y	Y				Y
87	Freshwater	Groundwater	Groundwater - protection (toxic chemicals)	Willingness to pay to eliminate the risk of toxic chemicals reaching groundwater (New Zealand)	Y	Y	Y		Y	Y	Y				Y
88	Freshwater	Groundwater	Groundwater - low flow alleviation	Willingness to pay for 'general river users' for low flow alleviation									Y		
89	Freshwater	Groundwater	Groundwater scheme - support water birds	Improvement from river not capable of supporting water birds to one that is good enough for water birds				Y					Y		
90	Freshwater	Groundwater	Groundwater scheme - support fish	Improvement from river good enough for water birds to one good enough to support fish				Y					Y		
91	Freshwater	Groundwater	Groundwater scheme - support trout	Improvement from river with good coarse fishery to one able to support trout									Y		
92	Freshwater	Groundwater	Groundwater scheme - support trout	Price premium for proximity to rivers									Y		

93	Freshwater	Groundwater	Groundwater scheme - property	Price premium for water fronting properties based on survey of estate agents											Y
94	Freshwater	Groundwater	Groundwater scheme - recreation (disruption)	Cost per person per year from disruption to recreational activities during works											
95	Freshwater	Groundwater	Groundwater scheme - inland marsh	Valuation of total ecosystem services provided by inland marsh										Y	
96	Freshwater	Groundwater	Groundwater scheme - peat bog	Valuation of total ecosystem services provided by peat bog										Y	
97	Freshwater	Groundwater	Groundwater scheme - saltmarsh	Valuation of total ecosystem services provided by saltmarsh											
98	Freshwater	Groundwater	Groundwater scheme - intertidal mudflats	Valuation of total ecosystem services provided by intertidal mudflats											
99	Freshwater	Groundwater	Groundwater scheme - species loss (high)	Avoid 10% decrease of up to 10 birds and plant species (high)							Y		Y	Y	
100	Freshwater	Groundwater	Groundwater scheme - species loss (low)	Avoid 5% decrease of up to 10 birds and plant species (low)							Y		Y	Y	
101	Freshwater	Groundwater	Groundwater scheme - river flows	Avoid a small decrease in river flows									Y		
102	Freshwater	Groundwater	Groundwater scheme - river flows	Willingness to pay to maintain or improve flow in 40 low flow rivers in England									Y		
103	Habitat provision	Habitat improvement	Inland marsh	Habitat (and ecosystem service) provision through improved water quality										Y	
104	Habitat provision	Habitat improvement	Saltmarsh	Habitat (and ecosystem service) provision through improved water quality											

105	Habitat provision	Habitat improvement	Intertidal mudflat	Habitat (and ecosystem service) provision through improved water quality											
106	Habitat provision	Habitat improvement	Peat bog	Habitat (and ecosystem service) provision through improved water quality										Y	
107	Air quality	Pollutant (air)	NOX Domestic	Damage costs for emission of pollutant into air											Y
108	Air quality	Pollutant (air)	NOX Agriculture	Damage costs for emission of pollutant into air	Y					Y	Y				Y
109	Air quality	Pollutant (air)	NOX Waste	Damage costs for emission of pollutant into air											Y
110	Air quality	Pollutant (air)	NOX Industry	Damage costs for emission of pollutant into air											Y
111	Air quality	Pollutant (air)	NOX ESI	Damage costs for emission of pollutant into air											Y
112	Air quality	Pollutant (air)	SOX	Damage costs for emission of pollutant into air											Y
113	Air quality	Pollutant (air)	PM10 Domestic	Damage costs for emission of pollutant into air											Y
114	Air quality	Pollutant (air)	PM10 Agriculture	Damage costs for emission of pollutant into air	Y					Y	Y				
115	Air quality	Pollutant (air)	PM10 Waste	Damage costs for emission of pollutant into air											Y
116	Air quality	Pollutant (air)	PM10 Industry	Damage costs for emission of pollutant into air											Y
117	Air quality	Pollutant (air)	PM10 ESI	Damage costs for emission of pollutant into air											Y
118	Air quality	Pollutant (air)	Ammonia	Damage costs for emission of pollutant into air						Y	Y				Y
119	Air quality	Pollutant (air)	NOx	Damage costs for emission of pollutant into air											Y
120	Air quality	Pollutant (air)	SO2	Damage costs for emission of pollutant into air											Y
121	Air quality	Pollutant (air)	PM10	Damage costs for emission of pollutant into air											Y

122	Air quality	Pollutant (air)	NH3	Damage costs for emission of pollutant into air						Y	Y				Y
123	Air quality	Pollutant (air)	Arsenic	Damage costs for emission of pollutant into air											Y
124	Air quality	Pollutant (air)	Cadmium	Damage costs for emission of pollutant into air											Y
125	Air quality	Pollutant (air)	Chromium	Damage costs for emission of pollutant into air											Y
126	Air quality	Pollutant (air)	Nickel	Damage costs for emission of pollutant into air											Y
127	Air quality	Pollutant (air)	1, 3 Butadiene	Damage costs for emission of pollutant into air											Y
128	Air quality	Pollutant (air)	Benzene	Damage costs for emission of pollutant into air											Y
129	Air quality	Pollutant (air)	PAH	Damage costs for emission of pollutant into air											Y
130	Air quality	Pollutant (air)	Diesel particulate matter	Damage costs for emission of pollutant into air											Y
131	Air quality	Pollutant (air)	Formaldehyde	Damage costs for emission of pollutant into air											Y
132	Air quality	Pollutant (air)	Dioxins/furans	Damage costs for emission of pollutant into air											Y
133	Habitat - water	Habitat improvement	Blanket bog	Value people are willing to pay to secure gains from current levels under "Improved scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions										Y	

134	Habitat - land	Habitat improvement	Upland heath	Value people are willing to pay to secure gains from current levels under "Improved scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions							Y			Y	
135	Habitat - land	Habitat improvement	Native woodland	Value people are willing to pay to secure gains from current levels under "Improved scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions			Y								
136	Habitat - water	Habitat improvement	Blanket bog	Value people are willing to pay to secure gains from current levels under "Decline scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions										Y	

137	Habitat - land	Habitat improvement	Upland heath	Value people are willing to pay to secure gains from current levels under "Decline scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions							Y			Y	
138	Habitat - land	Habitat improvement	Native woodland	Value people are willing to pay to secure gains from current levels under "Decline scenario" - investments made to deliver a greater range of ecosystem services through habitat restoration and more sympathetic land management interventions			Y								
139	Ecosystem service		Wild food	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y								
140	Ecosystem service		Non-food products	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y		Y			Y			
141	Ecosystem service		Climate regulation	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y		Y			Y			Y

142	Ecosystem service		Water regulation	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
143	Ecosystem service		Sense of place	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
144	Ecosystem service		Charismatic species	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)		Y	Y					Y	Y	Y	
145	Ecosystem service		Non-charismatic species	Value of ecosystem services delivered as a direct consequence of UK BAP conservation activities (current spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
146	Ecosystem service		Wild food	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)		Y	Y								
147	Ecosystem service		Non-food products	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)		Y	Y		Y			Y			

148	Ecosystem service		Climate regulation	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
149	Ecosystem service		Water regulation	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
150	Ecosystem service		Sense of place	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
151	Ecosystem service		Charismatic species	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)		Y	Y					Y	Y	Y	
152	Ecosystem service		Non-charismatic species	Value of ecosystem services (**additional benefits** beyond current spend scenario) delivered as a direct consequence of UK BAP conservation activities (increased spend scenario)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
153	Habitat - land	Habitat improvement	Arable margins	Value of BAP habitat under current spend scenario	Y	Y									

154	Habitat - water	Habitat improvement	Blanket bog	Value of BAP habitat under current spend scenario										Y	
155	Habitat - land	Habitat improvement	Hedgerows	Value of BAP habitat under current spend scenario		Y									
156	Habitat - land	Habitat improvement	Limestone pavement	Value of BAP habitat under current spend scenario								Y			
157	Habitat - land	Habitat improvement	Low calc grassland	Value of BAP habitat under current spend scenario						Y	Y				
158	Habitat - land	Habitat improvement	Low dry acid grass	Value of BAP habitat under current spend scenario						Y	Y				
159	Habitat - land	Habitat improvement	Lowland heath	Value of BAP habitat under current spend scenario						Y	Y				
160	Habitat - land	Habitat improvement	Low hay meadow	Value of BAP habitat under current spend scenario						Y	Y				
161	Habitat - land	Habitat improvement	Purple moor, grass	Value of BAP habitat under current spend scenario						Y	Y				
162	Habitat - land	Habitat improvement	Upland calc grass	Value of BAP habitat under current spend scenario						Y	Y				
163	Habitat - land	Habitat improvement	Upland hay meadow	Value of BAP habitat under current spend scenario						Y	Y				
164	Habitat - land	Habitat improvement	Upland heath	Value of BAP habitat under current spend scenario						Y	Y				
165	Habitat - water	Habitat improvement	Coastal floodplain	Value of BAP habitat under current spend scenario											
166	Habitat - water	Habitat improvement	Fens	Value of BAP habitat under current spend scenario										Y	

167	Habitat - water	Habitat improvement	Lowland raised bog	Value of BAP habitat under current spend scenario										Y	
168	Habitat - water	Habitat improvement	Wet reed beds	Value of BAP habitat under current spend scenario										Y	
169	Habitat - land	Habitat improvement	Native woodland	Value of BAP habitat under current spend scenario			Y								
170	Habitat - land	Habitat improvement	Arable fields	Value of BAP habitat under current spend scenario	Y										
171	Habitat - land	Habitat improvement	Improved grassland	Value of BAP habitat under current spend scenario						Y					
172	Habitat - land	Habitat improvement	Arable margins	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario	Y	Y									
173	Habitat - water	Habitat improvement	Blanket bog	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
174	Habitat - land	Habitat improvement	Hedgerows	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario		Y									
175	Habitat - land	Habitat improvement	Limestone pavement	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario								Y			
176	Habitat - land	Habitat improvement	Low calc grassland	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				

177	Habitat - land	Habitat improvement	Low dry acid grass	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
178	Habitat - land	Habitat improvement	Lowland heath	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
179	Habitat - land	Habitat improvement	Low hay meadow	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
180	Habitat - land	Habitat improvement	Purple moor, grass	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
181	Habitat - land	Habitat improvement	Upland calc grass	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
182	Habitat - land	Habitat improvement	Upland hay meadow	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				
183	Habitat - land	Habitat improvement	Upland heath	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y	Y				

184	Habitat - water	Habitat improvement	Coastal floodplain	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario											
185	Habitat - water	Habitat improvement	Fens	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
186	Habitat - water	Habitat improvement	Lowland raised bog	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
187	Habitat - water	Habitat improvement	Wet reed beds	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario										Y	
188	Habitat - land	Habitat improvement	Native woodland	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario			Y								
189	Habitat - land	Habitat improvement	Arable fields	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario	Y										
190	Habitat - land	Habitat improvement	Improved grassland	Value of BAP habitat (additional benefits beyond current spend) under increased spend scenario						Y					
191	Water purification and waste treatment	Pollutant (water)	Nitrate	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y

192	Water purification and waste treatment	Pollutant (water)	Phosphorus	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y
193	Water purification and waste treatment	Pollutant (water)	Sediment	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y
194	Water purification and waste treatment	Pollutant (water)	Ammonia	Value for environmental benefit per unit pollutant emission reduced	Y	Y	Y		Y	Y	Y			Y	Y
195	Water purification and waste treatment	Pollutant (water)	Methane	Value for environmental benefit per unit pollutant emission reduced	Y					Y	Y			Y	Y
196	Water purification and waste treatment	Pollutant (water)	Nitrous oxide	Value for environmental benefit per unit pollutant emission reduced											Y
197	Water purification and waste treatment	Pollutant (water)	Energy use	Value for environmental benefit per unit pollutant emission reduced											
198	Water purification and waste treatment	Pollutant (water)	Pesticides	Value for environmental benefit per unit pollutant emission reduced											
199	Water purification and waste treatment	Pollutant (water)	FIOs	Value for environmental benefit per unit pollutant emission reduced											
200	Aesthetics	Marine (aesthetics)	Avoiding presence of litter / dog mess	Avoiding presence of litter / dog mess	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

201	Water purification and waste treatment	Habitat improvement	Improved bathing water quality - human health	Valuation relates to the benefits of a 1% reduction in the risk of illness for recreational users of coastal bathing waters. Improvements in bathing water quality are associated with attaining sufficient status under the EU revised Bathing Water Directive (rBWD).											
202	Habitat - water	Habitat creation	Wetland	1. Valuations are based on 10 ha increase in wetland area 2. Valuations are based on an increase in the extent of saltmarsh of approx. 1,000 – 2,000 ha.										Y	
203	Aesthetics	Property prices	Property value - proximity to landfill	Property value reduction depending on proximity to landfill site											Y
204	Food	Agriculture	Value of crops (enclosed farmland)	Value per tonne of crop	Y										
205	Food	Agriculture	Value livestock (enclosed farmland)	Value per head of livestock						Y	Y				
206	Recreation - land	Habitat (recreation)	Recreation - enclosed farmland	Value per visit to sites for informal recreation activities (e.g. walking, dog-walking, picnics) i.e. not specialist	Y					Y	Y				
207	Food	Aquaculture	Value of rainbow trout	Value per tonne of commercial rainbow trout									Y		
208	Recreation - water	Habitat (recreation)	Recreation - freshwater, wetlands and floodplains	Value per visit				Y					Y	Y	
209	Food	Aquaculture	Value of fish landings	Value per tonne of fish (first sale value)											
210	Recreation - water	Habitat (recreation)	Recreation - marine	Value per visit											
211	Recreation - land	Habitat (recreation)	Recreation - mountains, moors and heaths	Value per visit											
212	Habitat - land	Habitat creation	Peat bog	Valuation based on 10 ha increase in wetland area										Y	

213	Food	Agriculture	Value of crop (semi-natural grassland)	Value per head of livestock						Y	Y				
214	Recreation - land	Habitat (recreation)	Recreation - semi-natural grassland	Value per visit						Y	Y				
215	Aesthetics	Urban (aesthetics)	Aesthetics - urban (green space)	Value per hectare of urban green space											Y
216	Recreation - land	Habitat (recreation)	Recreation - urban (green space)	Value per visit											Y
217	Fibre	Forestry (fibre)	Timber provision	Value of timber provision			Y								
218	Recreation - land	Habitat (recreation)	Recreation - woodland	Value per visit			Y								
219	Freshwater	Provision of water	Combined water and sewerage provision - households	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y	Y	
220	Freshwater	Provision of water	Sewerage only - households	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y	Y	
221	Freshwater	Provision of water	Combined water and sewerage provision - businesses	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y	Y	

222	Freshwater	Provision of water	Sewerage only - businesses	Willingness to pay for all services improving to level +1 (intermediate improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
223	Freshwater	Provision of water	Combined water and sewerage provision - households	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
224	Freshwater	Provision of water	Sewerage only - households	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
225	Freshwater	Provision of water	Combined water and sewerage provision - businesses	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		
226	Freshwater	Provision of water	Sewerage only - businesses	Willingness to pay for all services improving to level +2 (stretch improvement), where value is the bill increase in 2020/21 where the cost gradually adjusts over 5 years i.e. figure divided by 5				Y					Y		

227	Freshwater	Provision of water	Discolouration/taste & smell - households	Unit valuations of service attributes				Y					Y		
228	Freshwater	Provision of water	Discolouration/taste & smell - businesses	Unit valuations of service attributes				Y					Y		
229	Freshwater	Provision of water	Discolouration/taste & smell - all customers	Unit valuations of service attributes				Y					Y		
230	Freshwater	Provision of water	Short interruptions - households	Unit valuations of service attributes											Y
231	Freshwater	Provision of water	Short interruptions - businesses	Unit valuations of service attributes											Y
232	Freshwater	Provision of water	Short interruptions - all customers	Unit valuations of service attributes											Y
233	Freshwater	Provision of water	Hosepipe bans (H/IOW) - households	Unit valuations of service attributes					Y						Y
234	Freshwater	Provision of water	Hosepipe bans (H/IOW) - businesses	Unit valuations of service attributes					Y						Y
235	Freshwater	Provision of water	Hosepipe bans (H/IOW) - all customers	Unit valuations of service attributes					Y						Y
236	Freshwater	Provision of water	Hosepipe bans (K/S) - households	Unit valuations of service attributes					Y						Y
237	Freshwater	Provision of water	Hosepipe bans (K/S) - businesses	Unit valuations of service attributes					Y						Y
238	Freshwater	Provision of water	Hosepipe bans (K/S) - all customers	Unit valuations of service attributes					Y						Y
239	Freshwater	Provision of water	Rota cuts - households	Unit valuations of service attributes											Y
240	Freshwater	Provision of water	Rota cuts - businesses	Unit valuations of service attributes											Y
241	Freshwater	Provision of water	Rota cuts - all customers	Unit valuations of service attributes											Y
242	Freshwater	Provision of water	Long term stoppages - households	Unit valuations of service attributes											Y
243	Freshwater	Provision of water	Long term stoppages - businesses	Unit valuations of service attributes											Y
244	Freshwater	Provision of water	Long term stoppages - all customers	Unit valuations of service attributes											Y
245	Freshwater	Provision of water	Internal sewer flooding - households	Unit valuations of service attributes											Y
246	Freshwater	Provision of water	Internal sewer flooding - businesses	Unit valuations of service attributes											Y
247	Freshwater	Provision of water	Internal sewer flooding - all customers	Unit valuations of service attributes											Y
248	Freshwater	Provision of water	External sewer flooding - households	Unit valuations of service attributes											Y
249	Freshwater	Provision of water	External sewer flooding - businesses	Unit valuations of service attributes											Y
250	Freshwater	Provision of water	External sewer flooding - all customers	Unit valuations of service attributes											Y

251	Freshwater	Provision of water	Odour from sewage works - households	Unit valuations of service attributes											Y
252	Freshwater	Provision of water	Odour from sewage works - businesses	Unit valuations of service attributes											Y
253	Freshwater	Provision of water	Odour from sewage works - all customers	Unit valuations of service attributes											Y
254	Freshwater	Provision of water	Pollution incidents - households	Unit valuations of service attributes				Y					Y	Y	
255	Freshwater	Provision of water	Pollution incidents - businesses	Unit valuations of service attributes				Y					Y	Y	
256	Freshwater	Provision of water	Pollution incidents - all customers	Unit valuations of service attributes				Y					Y	Y	
257	Freshwater	Provision of water	River water quality - households	Unit valuations of service attributes									Y		
258	Freshwater	Provision of water	River water quality - businesses	Unit valuations of service attributes									Y		
259	Freshwater	Provision of water	River water quality - all customers	Unit valuations of service attributes									Y		
260	Freshwater	Provision of water	Bathing water quality - households	Unit valuations of service attributes										Y	
261	Freshwater	Provision of water	Bathing water quality - businesses	Unit valuations of service attributes										Y	
262	Freshwater	Provision of water	Bathing water quality - all customers	Unit valuations of service attributes										Y	
263	Freshwater	Provision of water	Discoloured water - household	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
264	Freshwater	Provision of water	Supply interruptions - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y

265	Freshwater	Provision of water	Hosepipe bans - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)					Y						Y
266	Freshwater	Provision of water	Persistent low pressure - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
267	Freshwater	Provision of water	Discoloured water - household	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
268	Freshwater	Provision of water	Supply interruptions - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y

269	Freshwater	Provision of water	Hosepipe bans - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)					Y						Y
270	Freshwater	Provision of water	Persistent low pressure - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
271	Freshwater	Provision of water	Discoloured water - household	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
272	Freshwater	Provision of water	Supply interruptions - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y

273	Freshwater	Provision of water	Hosepipe bans - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)					Y						Y
274	Freshwater	Provision of water	Persistent low pressure - households	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
275	Freshwater	Provision of water	Discoloured water - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
276	Freshwater	Provision of water	Supply interruptions - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y

277	Freshwater	Provision of water	Hosepipe bans - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)					Y						Y
278	Freshwater	Provision of water	Persistent low pressure - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level -1 (worsens)											Y
279	Freshwater	Provision of water	Discoloured water - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
280	Freshwater	Provision of water	Supply interruptions - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y

281	Freshwater	Provision of water	Hosepipe bans - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)					Y						Y
282	Freshwater	Provision of water	Persistent low pressure - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +1 (intermediate improvement)											Y
283	Freshwater	Provision of water	Discoloured water - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
284	Freshwater	Provision of water	Supply interruptions - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y

285	Freshwater	Provision of water	Hosepipe bans - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)					Y						Y
286	Freshwater	Provision of water	Persistent low pressure - businesses	Values are the maximum amount extra customers are willing to pay in 2019/20 (where the cost gradually adjusts over 5 years i.e. figure divided by 5) if service provision worsens to level +2 (stretch improvement)											Y
287	Freshwater	Provision of water	Discoloured water - households	Unit Values for Service Measures											Y
288	Freshwater	Provision of water	Hosepipe bans - households	Unit Values for Service Measures					Y						Y
289	Freshwater	Provision of water	Persistent low pressure - households	Unit Values for Service Measures											Y
290	Freshwater	Provision of water	Supply interruptions - households	Unit Values for Service Measures											Y
291	Freshwater	Provision of water	Discoloured water - businesses	Unit Values for Service Measures											Y
292	Freshwater	Provision of water	Hosepipe bans - businesses	Unit Values for Service Measures					Y						Y
293	Freshwater	Provision of water	Persistent low pressure - businesses	Unit Values for Service Measures											Y
294	Freshwater	Provision of water	Supply interruptions - businesses	Unit Values for Service Measures											Y
295	Freshwater	Provision of water	Discoloured water - all customers	Unit Values for Service Measures											Y
296	Freshwater	Provision of water	Hosepipe bans - all customers	Unit Values for Service Measures					Y						Y
297	Freshwater	Provision of water	Persistent low pressure - all customers	Unit Values for Service Measures											Y
298	Freshwater	Provision of water	Supply interruptions - all customers	Unit Values for Service Measures											Y
299	Habitat - water	Habitat creation	Inland marsh	Willingness to pay for creation/improvement of inland marsh habitat										Y	

300	Biodiversity	Biodiversity	Biodiversity preservation	Benefits from biodiversity	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
301	Recreation - land	Activity (recreation)	Walking/cycling	Use of green space for walking and cycling	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
302	Recreation - water	Habitat (recreation)	Recreation - wetlands	Recreational benefits from constructed wetlands				Y						Y	
303	Recreation - land	Habitat (recreation)	Recreation - forests	Value per visit to forest with limited access/amenities			Y								
304	Recreation - land	Activity (recreation)	Angling (coarse)	Willingness to pay for additional angling visit (coarse)				Y					Y	Y	
305	Recreation - land	Activity (recreation)	Angling (game)	Willingness to pay for additional angling visit (game)				Y					Y		
306	Recreation - land	Activity (recreation)	Nature watching	Willingness to pay for additional visit for nature watchers visiting forests	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
307	Recreation - land	Habitat (recreation)	Recreation - grasslands	Value of general recreational visit						Y	Y				
308	Recreation - water	Habitat (recreation)	Recreation - freshwater and floodplains	Value of general recreational visit				Y					Y	Y	
309	Recreation - land	Habitat (recreation)	Recreation - greenbelt and urban fringe	Value of general recreational visit	Y	Y	Y		Y	Y	Y				Y
310	Aesthetics	Urban (aesthetics)	Aesthetics - street greening	Value to residents for street improvement through planting of small/large trees and green verges along the street (low value for small trees, med value for large trees, high value for large trees and planting)		Y									Y
311	Aesthetics	Urban (aesthetics)	Aesthetics - increase area of local ponds	Value to residents of increasing the area of local ponds										Y	Y
312	Aesthetics	Property prices	Property value increase - green space	Increase in property prices for 1% increase in green space share of land use	Y	Y	Y		Y	Y	Y				Y
313	Aesthetics	Property prices	Property value increase - area of local ponds	Increase in property prices for 1% increase in water share of land use										Y	
314	Aesthetics	Urban (aesthetics)	Aesthetics - increase area of local ponds	Value to households of increasing the area of local ponds										Y	

315	Aesthetics	Property prices	Property price premium (detached) - city park	Average property value premium for a detached house within 450m of city park					Y						
316	Aesthetics	Property prices	Property price premium (flat) - city park	Average property value premium for a flat within 450m of city park					Y						
317	Aesthetics	Property prices	Property price premium (non-detached) - city park	Average property value premium for a non-detached house within 450m of city park					Y						
318	Aesthetics	Property prices	Property price premium (detached) - local park	Average property value premium for a detached house within 450m of local park					Y						
319	Aesthetics	Property prices	Property price premium (flat) - local park	Average property value premium for a flat within 450m of local park					Y						
320	Aesthetics	Property prices	Property price premium (non-detached) - local park	Average property value premium for a non-detached house within 450m of local park					Y						
321	Aesthetics	Property prices	Property price premium (detached) - green space	Average property value premium for a detached house within 450m of green space		Y	Y		Y						
322	Aesthetics	Property prices	Property price premium (flat) - green space	Average property value premium for a flat within 450m of green space		Y	Y		Y						
323	Aesthetics	Property prices	Property price premium (non-detached) - green space	Average property value premium for a non-detached house within 450m of green space		Y	Y		Y						
324	Flooding	Damage costs (Flooding)	Damage costs to property at risk of flooding	Average damage costs to property from flooding											
325	Flooding	Damage costs (Flooding)	Economic cost of flooding - residential	Average insurance claim for residential property (2007 floods)											
326	Flooding	Damage costs (Flooding)	Economic cost of flooding - commercial	Average insurance claim for commercial property (2007 floods)											

327	Flooding	Damage costs (Flooding)	Economic cost of flooding - schools	Value of a school day lost as a result of flooding											
328	Flooding	Damage costs (Flooding)	Economic cost of flooding - electricity	Value of avoiding electricity disruption as a result of flooding											
329	Flooding	Damage costs (Flooding)	Economic cost of flooding - water supply	Value of avoiding interruptions to water supply as a result of flooding											
330	Flooding	Damage costs (Flooding)	Economic costs of flooding - agricultural land (arable)	Flood damage to arable agricultural land (2007 floods)											
331	Flooding	Damage costs (Flooding)	Economic costs of flooding - agricultural land (grassland/livestock)	Flood damage to grassland/livestock agricultural land (2007 floods)											
332	Flooding	Damage costs (Flooding)	Economic costs of flooding - working days	Value of working time using average hourly wage											
333	Flooding	Reduce/remove risk (flooding)	Reduce internal sewer flooding - residential	Reduce internal sewer flooding by 1 incident to 1 property (residential)											
334	Flooding	Reduce/remove risk (flooding)	Reduce external sewer flooding - residential	Reduce external sewer flooding by 1 incident to 1 property (residential)											
335	Flooding	Reduce/remove risk (flooding)	Reduce internal sewer flooding - commercial	Reduce internal sewer flooding by 1 incident to 1 property (commercial)											
336	Flooding	Reduce/remove risk (flooding)	Reduce external sewer flooding - commercial	Reduce external sewer flooding by 1 incident to 1 property (commercial)											
337	Flooding	Reduce/remove risk (flooding)	Reduce internal flooding - residential	Reduce internal flooding to 1 property (residential)											
338	Flooding	Reduce/remove risk (flooding)	Reduce internal flooding - commercial	Reduce internal flooding to 1 property (commercial)											
339	Freshwater	Groundwater	Groundwater - long run marginal costs (water companies)	Water and wastewater treatment savings from direct groundwater abstraction											

340	Freshwater	Groundwater	Groundwater - replacement cost	Water replacement cost based on the sale price of domestic water supply divided by a factor representing all abstraction and processing costs for a hybrid site in the East Midlands											
341	Freshwater	Groundwater	Groundwater - abstraction and treatment	Marginal values from Scottish Government for abstraction and treatment of groundwater for households											
342	Freshwater	Groundwater	Groundwater - industrial abstraction	Savings to industry from direct abstraction. Direct industrial abstraction of groundwater based on market price of alternative water supply less other costs included.											
343	Aesthetics	Property prices	Property value increase - city park enhancement	Average property value increase following city park enhancement					Y						
344	Aesthetics	Property prices	Property value increase - local park enhancement	Average property value increase following local park enhancement					Y						
345	Aesthetics	Property prices	Property value increase - green space enhancement	Average property value increase following green space enhancement		Y	Y		Y						
346	Aesthetics	Property prices	Property value increase - city park creation	Average property value increase following city park creation					Y						
347	Aesthetics	Property prices	Property value increase - local park creation	Average property value increase following local park creation					Y						
348	Aesthetics	Property prices	Property value increase - green space creation	Average property value increase following green space creation		Y	Y		Y						
349	Recreation	Expenditure (recreation)	Expenditure per person - day	NW average expenditure per person - day	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

350	Recreation	Expenditure (recreation)	Expenditure per person - night	NW average expenditure per person - overnight	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
351	Recreation - land	Activity (recreation)	Hill walking	Value per visit	Y	Y	Y			Y	Y	Y			
352	Recreation - land	Activity (recreation)	Casual walking	Value per visit (average visit is 6 hours)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
353	Recreation - water	Activity (recreation)	Freshwater angling	Willingness to pay for coarse fishing in and around Leeds				Y					Y	Y	
354	Recreation - land	Activity (recreation)	Bird watching	Willingness to pay of nature watchers visiting forests	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
355	Recreation - land	Activity (recreation)	Game shooting	Willingness to pay to avoid loss of deer to shoot	Y		Y			Y	Y				
356	Recreation - land	Activity (recreation)	Cycling	Willingness to pay per person	Y		Y	Y		Y	Y		Y		Y
357	Recreation - land	Activity (recreation)	Horse riding	Willingness to pay per person	Y		Y			Y	Y				
358	Recreation - land	Habitat (recreation)	Woodland visit (local up to 10 miles)	Value of general recreational visit			Y								
359	Recreation - water	Activity (recreation)	Rutland Water (multiple uses)	Made up of travel costs £9.40 and 16.10 for time										Y	
360	Recreation - land	General use (recreation)	General park use	General use of park (playgrounds, trails, dog walking)					Y						
361	Recreation - land	General use (recreation)	Green space use	Average value of leisure time (walking and cycling) - based on time spent at location and value of time	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
362	Recreation - land	Expenditure (recreation)	Expenditure during visits to natural environment	Average expenditure during visits to the natural environment	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
363	Recreation - land	Expenditure (recreation)	Expenditure during visits to nature reserve	Estimated visitor spending to the local economy within 20 miles of the RSPB Leighton Moss reserve and neighbouring sites in Silverdale, Lancashire			Y	Y		Y	Y		Y	Y	
364	Recreation - land	Habitat (recreation)	Recreation - nature reserve	Value of access to Wren's Nest National Nature Reserve											
365	Recreation - land	Expenditure (recreation)	Expenditure during visits to nature reserve	Estimated visitor spending to the local economy (Forest of Dean) of the Symond's Yat Rock reserve in Gloucestershire											

366	Recreation - water	Activity (recreation)	Trout and salmon fishing	Value willing to pay for river habitat improvements that significantly improve the quality and quantity of trout and salmon in the River Wye				Y					Y	Y	
367	Recreation - land	Habitat (recreation)	Recreation - natural environment	Average value of access to the Jurassic Coast with interpretive material								Y			
368	Recreation - land	Habitat (recreation)	Recreation - natural environment	Average value of recreational visit to silverstrand Beach, near Galway (Ireland)											
369	Recreation - land	Activity (recreation)	Walking (lowlands)	Average value of access to improved site (lowland)	Y	Y	Y	Y	Y	Y	Y		Y	Y	
370	Recreation - land	Activity (recreation)	Walking (highlands)	Average value of access to improved site (highland)		Y	Y			Y	Y	Y	Y	Y	
371	Habitat - water	Habitat creation	Water-dependent habitat created	Value of water-dependent habitat created				Y					Y	Y	
372	Habitat - water	Habitat creation	Intertidal habitat created	Value of net intertidal habitat created											
373	Habitat - water	Habitat creation	Protected river improved	Value of protected river improved									Y		
374	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved river quality	Willingness to pay for improving river quality through removal of litter and filling channel with water for informal recreation									Y		
375	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved river quality	Willingness to pay for improving river quality through the creation of new meanders, bankside planting and some habitat creation for informal recreation									Y		
376	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved river quality	Willingness to pay for improving river quality through river restoration through channel modifications, habitat creation and landscaping for informal recreation									Y		

377	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flows every 4 or 5 years out of 20 years to full restoration to low flows once every 20 years for informal recreation									Y		
378	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flow conditions to environmentally acceptable flow regime in River Darent for informal recreation									Y		
379	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flow conditions to full restoration of River Avon at Malmesbury for informal recreation									Y		
380	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from low flow conditions to full restoration of River Tavy at Tavistock for informal recreation									Y		
381	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay for improvement from current level of abstraction to 5cm increase in water levels for informal recreation									Y	Y	
382	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 5cm decrease in water levels for informal recreation									Y	Y	
383	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 45cm decrease in water levels for informal recreation									Y	Y	

384	Recreation - water	Habitat improvement (recreation)	Informal recreation - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 1m decrease in water levels for informal recreation									Y	Y	
385	Recreation - water	Habitat improvement (recreation)	Birdwatching - improved wetlands	Value for improving wetland to support birds (for birdwatching)				Y					Y	Y	
386	Recreation - water	Habitat improvement (recreation)	Birdwatching - improved wetlands	Value for provision of birdwatching at different inland wetland sites (Tudeley Woods, Weir Woods and Pulborough Brooks)				Y					Y	Y	
387	Recreation - water	Habitat improvement (recreation)	Birdwatching - improved wetlands	Willingness to pay for the protection of site quality and characteristics against future damage and loss of birdwatching and habitat				Y					Y	Y	
388	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Willingness to pay for creation of poor quality fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2)				Y					Y	Y	
389	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Willingness to pay for creation of moderate quality fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2)				Y					Y	Y	
390	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Willingness to pay for creation of good quality fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2)				Y					Y	Y	
391	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Marginal value to improve fishery quality from no fishery to poor quality				Y					Y	Y	
392	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Marginal value to improve fishery from poor quality to moderate quality				Y					Y	Y	

393	Recreation - water	Habitat improvement (recreation)	Angling (coarse) - improved water quality	Marginal value to improve fishery from moderate quality to good quality				Y					Y	Y	
394	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Willingness to pay for creation of poor quality trout fishery (RE5, 4 or 3) (assumed average fish biomass <600g/100m2)									Y		
395	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Willingness to pay for creation of moderate quality trout fishery (RE4, 3, 2 or 1) (assumed average fish biomass 600-2000g/100m2)									Y		
396	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Willingness to pay for creation of good quality trout fishery (RE3, 2 or 1) (assumed average fish biomass >2000g/100m2)									Y		
397	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Marginal value to improve trout fishery quality from no fishery to poor quality									Y		
398	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Marginal value to improve trout fishery from poor quality to moderate quality									Y		
399	Recreation - water	Habitat improvement (recreation)	Angling (trout) - improved water quality	Marginal value to improve trout fishery from moderate quality to good quality									Y		
400	Recreation - water	Habitat improvement (recreation)	Angling (salmon) - improved water quality	Willingness to pay for creation of a new, good quality salmon fishery, where an average angler has a 1 in 10 chance of catching a salmon each day									Y		
401	Recreation - water	Habitat improvement (recreation)	Angling - improved flows/levels	Willingness to pay to reinstate fishery				Y					Y	Y	
402	Recreation - water	Habitat improvement (recreation)	Angling - improved flows/levels	Willingness to pay to improve flows and thus increase number of angling days in June, July and August (club anglers)				Y					Y	Y	

403	Recreation - water	Habitat improvement (recreation)	Angling - improved flows/levels	Willingness to pay to improve flows and thus increase number of angling days in June, July and August (syndicate members)				Y					Y	Y	
404	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery in England				Y					Y	Y	
405	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery in Wales				Y					Y	Y	
406	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery in Scotland				Y					Y	Y	
407	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery				Y					Y	Y	
408	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for river coarse fishery				Y					Y	Y	
409	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for improving coarse fishery quality from no fishery to poor				Y					Y	Y	
410	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for improving coarse fishery quality from poor quality to moderate quality				Y					Y	Y	
411	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent value for improving coarse fishery quality from moderate quality to good quality				Y					Y	Y	
412	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent marginal value for improving coarse fishery quality from no fishery to poor				Y					Y	Y	
413	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent marginal value for improving coarse fishery quality from poor quality to moderate quality				Y					Y	Y	
414	Recreation - water	Economic rent	Angling - economic rent river coarse fishery	Economic rent marginal value for improving coarse fishery quality from moderate quality to good quality				Y					Y	Y	
415	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishery in England									Y		

416	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishery in Wales								Y		
417	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishery in Scotland								Y		
418	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stocked water								Y		
419	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in wild fisheries in lowland rivers								Y		
420	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in wild fisheries upland waters								Y		
421	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (2 to 6 fish)								Y		
422	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (2 fish)								Y		
423	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (1 to 2 fish)								Y		
424	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for trout fishing in stillwater fisheries (seasonal let of a site to an angling club)								Y		
425	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for improving trout fishery quality from no fishery to poor								Y		
426	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for improving trout fishery quality from poor quality to moderate quality								Y		
427	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent value for improving trout fishery quality from moderate quality to good quality								Y		
428	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent marginal value for improving trout fishery quality from no fishery to poor								Y		

429	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent marginal value for improving trout fishery quality from poor quality to moderate quality									Y		
430	Recreation - water	Economic rent	Angling - economic rent trout fishery	Economic rent marginal value for improving trout fishery quality from moderate quality to good quality									Y		
431	Recreation - water	Habitat improvement (recreation)	Instream recreation - improved water quality	Value for improvement to canal to make boating possible				Y							
432	Recreation - water	Habitat improvement (recreation)	Instream recreation - improved water quality	Value to maintain the UK canal network in a state fit to support boating activities				Y							
433	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Small improvement in river quality from RE5 to RE4									Y		
434	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Medium improvement in river quality from RE5 to RE3 (top)									Y		
435	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Large improvement in river quality from RE5 to RE1									Y		
436	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	1% increase in dissolved oxygen saturation									Y		
437	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	1mg/litre decrease in BOD									Y		
438	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	1mgN/lire decrease in total ammonia									Y		
439	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Improve river water quality from poor quality (RE5) to medium quality (RE4/3)									Y		
440	Non-use benefits	Habitat improvement	Non-use benefits - improved river quality	Improve river water quality from medium quality (RE4/3) to good quality (RE2/1)									Y		
441	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Value to alleviate low flow in river (non-river users)									Y		

442	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay for improvement from current level of abstraction to 5cm increase in water levels for informal recreation (users and non users)									Y	Y	
443	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 5cm decrease in water levels for informal recreation (users and non users)									Y	Y	
444	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 45cm decrease in water levels for informal recreation (users and non users)									Y	Y	
445	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Willingness to pay to avoid change from current level of abstraction to 1m decrease in water levels for informal recreation (users and non users)									Y	Y	
446	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Alleviation of low flow across 40 priority rivers in England (residents)									Y		
447	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Alleviation of low flow across 40 priority rivers in England (general public)									Y		
448	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Value for an environmentally acceptable flow regime (residents)				Y					Y		
449	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Value for an environmentally acceptable flow regime (non users)				Y					Y		
450	Non-use benefits	Habitat improvement	Non-use benefits - improved flows/levels	Full improvement and return as far as possible to natural state across 30 worst affected rivers in Thames region									Y		

451	Natural hazard regulation	Flood prevention	Prevention of extreme events by coastal wetlands (tidal marshes)	Value of prevention of extreme events provided by coastal wetlands (tidal marshes)											
452	Genetic resources	Genetic resources	Swamps/marshes genepool	Protecting biodiversity in swamps/marshes										Y	
453	Natural hazard regulation	Flood prevention	Storm protection from tidal marshes	Value of the storm protection provided by tidal marshes											
454	Food	Aquaculture	Fish	Value of fish in the marine environment											
455	Climate regulation	C-sequestration	C-sequestration by the marine environment	Carbon sequestration by the marine environment											
456	Cultural heritage		Cultural heritage of the marine environment	Value of cultural heritage in the marine environment											
457	Recreation - water	Habitat (recreation)	Recreation in the marine environment	Value of recreation in the marine environment											
458	Genetic resources	Genetic resources	Marine genepool	Protecting biodiversity in the marine environment											
459	Nutrient cycling		Nutrient cycling in the marine environment	Value of nutrient cycling in the marine environment											
460	Water purification and waste treatment	Agricultural measures	Reduced river pollutant load	Annualised savings with a 5% reduction in the pollutant load in the Tamar River as part of Tamar 2000	Y					Y	Y				
461	Water purification and waste treatment	Agricultural measures	Reduced pressure on river system	Benefits to river system from farms following good practice advice as part of Tamar 2000	Y					Y	Y				
462	Food	Aquaculture	Sale of fish	Value of fish stocks as a farm diversification as distinct from angling/recreation as part of Tamar 2000											
463	Fuel	Coppicing	Thinning operations and coppicing	Annual benefits from thinning and coppicing operations as part of Tamar 2000			Y								
464	Climate regulation	C-sequestration	C-sequestration through land management changes	Carbon sequestration through land management changes as part of Tamar 2000	Y	Y	Y		Y	Y	Y				

465	Natural hazard regulation	Flood prevention	Flood prevention through removal of woody debris in rivers	Savings (to the Environment Agency) through avoided work as a result of woody debris in the river as part of Tamar 2000											
466	Erosion regulation	Erosion (water)	Erosion regulation - river	Reduced erosion of soil in the Tamar river as part of Tamar 2000									Y		
467	Recreation - water	Habitat improvement (recreation)	Recreation benefits for farms (Tamar 2000)	Recreation/tourism benefits (including fishing, shooting, holiday lets and employment creation) to farms as part of Tamar 2000	Y					Y	Y				
468	Soil formation	Soil formation	Soil formation benefits for farms	Soil formation benefits to farms as part of Tamar 2000 (under-sowing maize crops)	Y					Y	Y				
469	Nutrient cycling		Nutrient cycling from rewetting farmland	Nutrient cycling benefits from rewetting farmland as part of Tamar 2000	Y					Y	Y				
470	Water recycling	Water recycling	Water recycling from Tamar 2000	Water recycling benefits from enhancing the connectivity of land and water as part of Tamar 2000											
471	Habitat provision	Habitat creation	Habitat creation (woodland)	Benefits from habitat creation (woodland) created by farms as part of Tamar 2000			Y								
472	Fibre	Animal (fibre)	Fibre provision (wool)	Value of sheep fleece from Alkborough Flats scheme (minus loss of £5,180 from loss of straw and barley production)						Y	Y				
473	Genetic resources	Genetic resources	Rare breeds (sheep)	Value per head for rare sheep breeds						Y	Y				
474	Climate regulation	C sequestration	C-sequestration by saltwater wetlands	Carbon sequestration by restored mudflat, saltmarsh and reedbed habitat										Y	

475	Natural hazard regulation	Flood prevention	Saltwater wetlands - flood prevention	Value of flood prevention provided by restored mudflat, saltmarsh and reedbed habitat (over 100 years)											
476	Recreation - water	Habitat (recreation)	Recreation - saltwater wetlands	Recreational benefits from Alkborough Flats scheme (excluding informal recreation)											
477	Primary production	Primary production	Saltwater wetlands primary production	Increase to primary production from the replacement of monoculture with complex habitats as part of the Alkborough Flats scheme											
478	Habitat provision	Habitat improvement	Habitat improvement (saltwater wetlands)	Benefits from habitat improvement as part of the Alkborough Flats scheme											
479	Freshwater	Provision of water	Freshwater provision	Freshwater provision from buffer zoning (330m) on the upper Bristol Avon	Y	Y	Y			Y	Y				
480	Food	Agriculture	Food	Value of food provision from buffer zoning (330m) on the upper Bristol Avon	Y	Y				Y	Y				
481	Climate regulation	C sequestration	C-sequestration by riparian buffer	Carbon sequestration from buffer zoning (330m) on the upper Bristol Avon		Y									
482	Erosion regulation	Erosion (water)	Erosion regulation - riparian buffer	Erosion regulation from buffer zoning (330m) on the upper Bristol Avon		Y									
483	Recreation - water	Activity (recreation)	Angling - riparian buffer	Angling from buffer zoning (330m) on the upper Bristol Avon				Y					Y		
484	Tourism	Tourism	Tourism - riparian buffer	Tourism from buffer zoning (330m) on the upper Bristol Avon		Y									
485	Recreation - water	Habitat improvement (recreation)	Informal recreation	Local amenity and informal enjoyment from buffer zoning (330m) on the upper Bristol Avon	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y

486	Cultural heritage	Cultural heritage	Cultural values provided by riparian buffer	Cultural values (largely volunteer activities) from buffer zoning (330m) on the upper Bristol Avon	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y
487	Habitat provision	Habitat creation	Habitat creation by riparian buffer	Benefits from habitat creation from buffer zoning (330m) on the upper Bristol Avon		Y							Y		
488	Genetic resources	Genetic resources	Swamps/marshes genepool	Protecting biodiversity in swamps/marshes										Y	
489	Natural hazard regulation	Managed realignment	Saltmarsh	Absolute value of ecosystem services to saltmarsh habitat as part of Wareham managed realignment case study											
490	Natural hazard regulation	Managed realignment	Mudflat	Absolute value of ecosystem services to mudflat habitat as part of Wareham managed realignment case study											
491	Natural hazard regulation	Managed realignment	Reedbed	Absolute value of ecosystem services to reedbed habitat as part of Wareham managed realignment case study										Y	
492	Natural hazard regulation	Managed realignment	Woodland	Absolute value of ecosystem services to woodland habitat as part of Wareham managed realignment case study			Y								
493	Natural hazard regulation	Managed realignment	Heathland	Absolute value of ecosystem services to heathland habitat as part of Wareham managed realignment case study						Y	Y				
494	Natural hazard regulation	Managed realignment	Grazing marsh	Absolute value of ecosystem services to grazing marsh habitat as part of Wareham managed realignment case study						Y	Y				

495	Natural hazard regulation	Managed realignment	Grassland	Absolute value of ecosystem services to grassland habitat as part of Wareham managed realignment case study						Y	Y				
496	Nutrient cycling		Nutrient cycling in the marine environment	Value of nutrient cycling arising from marine protected areas designation in the UK											
497	Climate regulation	Climate regulation	Climate regulation in the marine environment	Climate regulation benefits (not specified) arising from marine protected areas designation in the UK											
498	Food	Aquaculture	Fish	Value of fish arising from marine protected areas designation in the UK											
499	Natural hazard regulation	Flood prevention	Prevention of extreme events by marine environment	Value of prevention of extreme events arising from marine protected areas designation in the UK											
500	Recreation - water	Habitat (recreation)	Recreation - marine environment	Value of recreation arising from marine protected areas designation in the UK											
501	Cultural heritage		Cultural heritage of the marine environment	Value of cultural heritage (unspecified) arising from marine protected areas designation in the UK											
502	Food	Aquaculture	Fish	Value of fish in proposed conservation zone in Lyme Bay											
503	Recreation - water	Activity (recreation)	Hunting / fishing	Value of hunting/fishing (recreational) in proposed conservation zone in Lyme Bay											
504	Recreation - water	Habitat (recreation)	Recreation - open ocean	Value of recreation in proposed conservation zone in Lyme Bay											
505	Natural hazard regulation	Flood prevention	Flood prevention from saltmarsh	Value of flood prevention provided by saltmarsh											

506	Water regulation	Water regulation	Water flows/river discharge by swamps/marshes	Benefits to water regulation provided by swamps/marshes										Y	

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