Celebrating Our Woodland Heritage
Yorkshire Water Property: Mixenden Reservoir
An Archaeological Woodland Survey

Pennine Prospects
Celebrating Our Woodland Heritage Project
Report No: PP4/130417

This report was commissioned by Yorkshire Water
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Summary

This report discusses the results of an archaeological woodland survey undertaken on behalf of Yorkshire Water at their property of Mixenden Reservoir, Ovenden, West Yorkshire. Over an area of 10.7 hectares, twenty six previously unrecorded features of archaeological and historical interest were identified and catalogued for the purpose of both updating the historical record of the region; and to highlight any recommendations for the future management of the property.

The majority of the features recorded during November 2016 related to the post-medieval landscape, in particular the land divisions that pre-date the construction of the late 19th century reservoir by the Halifax Corporation Water Works. Features of this period included drystone walls, terrace boundaries and carriageways. Within the south of the property the site of a small homestead known as Parsley Beds was also identified.
1.0 Introduction

This report has been compiled as part of the Celebrating Our Woodland Heritage project. This three year project (2016-2019) is jointly funded by Yorkshire Water, Heritage Lottery Fund, Green Bank Trust and Newground Together and aims to identify, record and interpret the historic environment of woodlands across the South Pennines (National Character Area 36 – Natural England, 2014).

Led by Pennine Prospects, the project recognises as a result of a desk-based study ‘Hidden Heritage of the South Pennine Woodlands’ (Brown, 2013), that “…number of sites recorded on the HER (Historic Environment Record) does not represent the true nature of the surviving archaeological resource”. The report highlighted that this underrepresentation (and general lack of knowledge) was the primary threat to woodland archaeology.

The Celebrating Our Woodland Heritage project therefore seeks to enhance the historic record for woodland across the South Pennines by means of a structured programme of archaeological walkover surveys. Where appropriate these surveys will provide the opportunity for members of the public, heritage and youth groups to engage and contribute towards the investigations.

Archaeological features to be recorded within areas of woodland can represent the whole of human history and use of the landscape. Features relating to the woodland itself can include historic or veteran trees; woodland boundaries; charcoal burning platforms; storage platforms; cottage sites; trackways and mills. Features may also predate the current woodland and represent prehistoric-medieval field boundaries; settlement sites or stones such as Bronze-Age cup and ring carvings.

The information collated during the field surveys will be deposited in the form of an archaeological report (CIfA, 2014) and digital record to the landowner and the regional Historic Environment Record. This data will not only guide future research into the region, but also support and promote the preservation of the historic environment as a part of any future management programmes within woodlands.
2.0 Location and Geology

Figure 1: Location of Mixenden Reservoir in relation to the wider region. Contains OS data © Crown copyright and database right (2017)

The Yorkshire Water Property of Mixenden Reservoir is located at NGR 405787 428962 within the south of Illingworth and Mixenden, Calderdale, West Yorkshire. The survey area (not including the reservoir) constituted 10.7 hectares, much of which comprised a mixed deciduous and conifer plantation 19th century plantation of beech, sycamore, scots pine, holly with occasional oak. Approximately 50% woodland cover within the property is listed on the Deciduous Woodland Priority Habitat Inventory for England as held by Natural England, the remainder is identified as either conifer or mixed conifer on the National Forest Inventory England 2014 (MAGIC 2016). The broader landscape is listed on the DEFRA Less Favoured Areas (England) register as Severely Disadvantaged, due to the negative effect of natural characteristics such as geology, altitude and climate on farming competition (MAGIC 2016).
The woodland occupies the foot of the gentle east-facing slopes of Warley Moor located approximately 1.6km to the west. The moor forms part of the South Pennine Moor Sites of Special Scientific Interest (ref: 1006648); Special Areas of Conservation (ref: UK0030280) and Special Protection Areas (ref: UK9007022, Natural England, MAGIC 2016). The survey area discussed within this report lies outside of these areas.

The land immediately to the west and north of the survey area is recognised as under Higher Level Stewardship Scheme (ref: AG00333129, Natural England, MAGIC 2016).

The survey area is intersected by four streams from the west, which converge on entering the property to form two channels that feed the reservoir located to the east. At its highest point (northwest corner) the property stands around 295m above sea level.
level. At its lowest point (the western edge of the reservoir) the site topography falls to approximately 265m above sea level.

The northern limit of the survey area was delineated by Hays Lane and the site of Mixenden Lodge Cottage; whereas to the west the woodland edge is marked by a modern fence line and irregular drystone wall. The southern extent of the woodland is delineated by a line of concrete bollards. The woodland is separated from the reservoir to the east by the reservoir boundary wall.

Access to the site was from the southeast via a public footpath that extends west from Clough Lane.

The Millstone Grit Group, which consists of fine to very coarse-grained feldspathic sandstones, interbedded with grey siltstones and mudstones forms the solid bedrock across the survey area. The bedrock is thickest (1225m) in Warfedale, Bradford and thinnest (150m) in North Staffordshire. The Millstone Grit Group was formed 313 to 326 million years ago during the Carboniferous Period when the area was dominated by rivers (BGS; 2016).

Soil across the site is described as slowly permeable wet very acid upland soils with a peaty surface (Cranfield University; 2016).
3.0 Historical and Archaeological Background

3.1 Historical Background

The location of the late prehistoric enclosed settlement (SAM: 1018235; HER: 2221) approximately 300m northwest of the survey area represent the earliest known human activity in the immediate area.

There is no mention of Mixenden or the neighbouring settlement of Illingworth at the time of 1086 Domesday Survey, although we can be certain the site was located within the Hundred of Morley, in the Manor of Wakefield. The closest settlements at the time of the Domesday Survey were those of Midgley (3.8km) and Warley (4km) located to the southwest and south respectively (Morris; 1986).

Place-name evidence indicates the name Mixenden comes from the Old English to mean ‘dung-hill valley’ (Smith; 1961).

Figure 3: Excerpt of the County of York Surveyed in (1772) MDCCCLXVII, VIII, IX, and MDCCCLXX Engraved by Thomas Jefferys (Sheet V). The dispersed nature of settlement in Mixenden is sticking compared to neighbouring Illingworth. Copyright © The British Library Board
Celebrating Our Woodland Heritage Mixenden Reservoir:
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The County of York Survey by Thomas Jefferys (figure 3), published in 1772 is one of the first accurate maps depicting the landscape and pattern of settlement around the site of Mixenden Reservoir. Though the reservoir is not depicted, Mixenden Lane is (now Clough Lane), connecting Illingworth to the east, with Luddingden and Midgley to the south west. In addition the site of a mill is depicted to the east of Mixenden upon the south flowing Hebble Brook. It is likely the mill relates to that of Mixenden Mill, a corn mill recorded on the 1847 Six-Inch Ordnance Survey (figure 4). Although Hays Mill utilised for the production of worsted wool is recorded to the northwest.

![Pattern of enclosure at Mixenden Reservoir reproduced from the 1847 Six-Inch Ordnance Survey. Copyright Pennine Prospects](image)

Figure 4: Pattern of enclosure at Mixenden Reservoir reproduced from the 1847 Six-Inch Ordnance Survey. Copyright Pennine Prospects

The pattern of settlement at Mixenden in the late 18th century is depicted as dispersed compared to the more nucleated pattern recorded at Illingworth. The dispersed nature of settlement is prevalent at the time of the 1847 Ordnance Survey Six-Inch Survey (figure 4), and offers additional information. Though the map predates the construction of the reservoir the farm/homesteads of Mixenden Green
(north) along Hays Lane and Parsley Beds (south) along Brow Bottom Lane are depicted. In addition the now derelict and ruinous farm/homestead sites of Mixenden Fields (HER: 14741), The Chapel (HER: 14742), Height and Teeming Hills are recorded on the east-facing valley slopes to the west. Interestingly the 'Site of Farmstead' (HER: 14743) located at the northwest corner of the property had not been established at the time of the 1847 Ordnance Survey publication.

Prior to the establishment of the reservoir and the current limits of the Yorkshire Water property the landscape was subdivided into multiple rectilinear enclosures, intersected by a series of footpaths which provided access to the numerous farm/homesteads from Mixenden Lane, Brow Bottom Lane and Hays Lane. The main north-south footpath which links Mixenden Green with Parsley Beds had been established by this date.

Figure 5: Pattern of enclosure at Mixenden Reservoir reproduced from the 1894 First County Series Survey. Copyright Pennine Prospects

By the time of the 1894 First County Series Survey (figure 5), Mixenden Reservoir had been constructed to the west of Mixenden Lane. In addition the settlement of
Mixenden had also developed along Mixenden Lane, close to Mixenden Bridge where Mixenden Mill (spindle) previously a corn mill) and Hays Mill (worsted) are recorded. To the south of the reservoir and adjacent to the Mixenden Lane a school had also been established. The surveyed property at this date had not yet been enclosed and continued to preserve its earlier form until the production of the 1908 1st Revision County Series Survey (figure 6), by which stage the current limits of the Yorkshire Water property had been established, along with a mixed conifer and deciduous plantation in the western half of the property.

Figure 6: Pattern of enclosure at Mixenden Reservoir reproduced from the 1907 1st Revision First County Series Survey. Copyright Pennine Prospects

The homestead of Parsley Beds within the south of the property was greatly reduced by this date. Only the garden boundaries along with a small rectangular structure in the northeast corner of the garden area are recorded. The main north-south footpath linking this site with that of Mixenden Green continues to represents the main route through the property by this date, with a subsidiary route linking with the footpath from the southwest via the lane adjacent to the woodland boundary.
By 1934 and the publication of the 3rd Revision County Series Survey the entirety of the property had been planted with mixed woodland (figure 7). With the exception of the boundaries immediately east and west of Mixenden Green the earlier pattern of field divisions had been largely removed by this date. The site of Parsley Beds is no longer recorded by this date.

Figure 7: Pattern of enclosure at Mixenden Reservoir reproduced from the 1934 3rd Revision First County Series Survey. Copyright Pennine Prospects

The mid-late 20th century witnessed a substantial increase in the development of Mixenden along the course of Mixenden Lane, with little or no alteration to the property’s woodland.

3.2 Light Detection and Ranging (LiDAR)

Analysis of the available LiDAR coverage at a resolution of one metre complements the historical map and survey data closely. Many of the features, including the course of the main footpath between the site of Parsley Beds and Mixenden Green; and the early field boundaries are distinct in their representation on both the slope (figure 8) and hillshade (figure 9) models.
In addition the LiDAR DTM’s, in particular the hillshade model identifies a number of features that were either missed due to the density of ground vegetation or were too subtle to identify due to poor light conditions.

Figure 8: LiDAR DTM slope model revealing subtle linear features such as tracks and boundaries within the survey area (centre).

The hillshade model (figure 9) of the surveyed area identifies an extensive area of ridge and furrow orientated east-west within the southern and eastern half of the property. Until the publication of the 1934 3rd Revision County Series Survey this area had remained unwooded and retained its earlier pattern of enclosure. Due to the peaty soil conditions it is unlikely these fields were cultivated, therefore the ridge and furrow is likely attributed to the ground preparation ahead of the mixed conifer/deciduous woodland plantation. The route of the subsidiary footpath which extend northeast from the woodland edge to link with the primary north-south footpath between Mixenden Green and Parsley Beds is also visible on both the hillshade and slope (figure 8) models. A possible continuation of this footpath (which does not appear on the historic mapping) is visible extending northeast towards the reservoir.
Figure 9: Comparative LiDAR Hillshade DTM model including the location of surveyed features.
Outside of the survey area to the west, the LiDAR DTM accurately depict the sites of Mixenden Fields (HER: 14741), The Chapel (HER: 14742), Height and Teeming Hills; patterns of relict field enclosure, as well as the network of lanes that traversed the east-facing slope to provide access to the sites. Of particular note is a straight, broad track that appears to connect Mixenden Fields in the south with ‘Site of Farmstead’ to the north. The lane is not recorded on any over the available historic mapping and would appear to represent an earlier route of communication within the area.

### 3.3 Archaeological Background

The only site of historic/archaeological interest recorded within the property prior to the survey was that of ‘Site of Farmstead’ (HER: 14743), located within the northwest corner of the property. The remaining sites lay to outside of the surveyed property to the west and northwest. The sites represent prehistoric through to post-medieval activity and include the scheduled ancient monument ‘Late Prehistoric enclosed settlement 350m southwest of Goose Clough at Hunter Hill, Ovenden’ (SAM: 1018235). See figure 2/Appendix 2 for map of known monument location.

*Table 1: List detailing the known archaeological records both within the property and within the 350 metres buffer zone.*

<table>
<thead>
<tr>
<th>SAM:</th>
<th>LB No:</th>
<th>NT HBSMR:</th>
<th>HER:</th>
<th>Name:</th>
<th>Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1018235</td>
<td></td>
<td></td>
<td></td>
<td>Late Prehistoric enclosed settlement 350m southwest of Goose Clough at Hunter Hill, Ovenden</td>
<td>Enclosure</td>
</tr>
<tr>
<td>2221</td>
<td></td>
<td></td>
<td></td>
<td>The Round Ring on Hunter Hill</td>
<td>Rock Carving</td>
</tr>
<tr>
<td>4958</td>
<td></td>
<td></td>
<td></td>
<td>Post-med enclosed field system and quarry and other rectilinear marks visible of AP’s</td>
<td>Field System</td>
</tr>
<tr>
<td>14741</td>
<td></td>
<td></td>
<td></td>
<td>Mixenden Fields</td>
<td>Farmstead</td>
</tr>
<tr>
<td>14742</td>
<td></td>
<td></td>
<td></td>
<td>Old Chapel</td>
<td>Chapel Site</td>
</tr>
<tr>
<td>14743</td>
<td></td>
<td></td>
<td></td>
<td>Site of Farmstead</td>
<td>Farmstead</td>
</tr>
</tbody>
</table>
4.0 Aims and Purpose of Assessment

This investigation forms a baseline record of the archaeological and historic features contained within the property. The general aims of the archaeological woodland survey described in this report were to:

1. Develop a history of land use for the property from readily available historic and archaeological documentation.
2. Identify previously unrecorded archaeological features and sites across the property.
3. Revisit and assess the condition of previously recorded archaeological features and sites across the property.
4. Propose management recommendations for the features and sites investigated.
5. Produce a database (Appendix 1) for use by Yorkshire Water and West Yorkshire Archaeology Advisory Service Historic Environment Record.
5.0 Methodology

5.1 Geology

Property information including any digital property mapping data was obtained from Yorkshire Water. Data concerning the statutory and non-statutory conditions of land and habitats both on and within the vicinity of the property was obtained from Natural England and made available for commercial use under the Open Government Licence. In addition the Natural England maintained MAGIC website was consulted. The webpage provides authoritative geographic information about the natural environment from across government. The information covers rural, urban, coastal and marine environments across Great Britain.

Site geological and soil data was obtained online from the British Geological Survey OpenGeoscience webpage. The data was downloaded and displayed using QGIS 2.18.2 'Las Palmas', an Open Source Geographic Information System (GIS). Site maps were produced at a scale to best illustrate the full extent of the woodland under investigation.

5.2 Historical and Archaeological Background

Previously collated historical and archaeological data concerning the site under investigation (which includes a 200m buffer around the area) was obtained from West Yorkshire Archaeology Advisory Service (WYAAS) as well as a search of the Heritage Gateway. Listed building; parks and gardens and scheduled monument data was obtained from the National Heritage List for England and downloaded as shapefiles from Historic England.

5.3 Map Regression

Historic map regression of woodlands will be undertaken as a means of identifying a broad account of landscape change and use. Where possible the available map coverage (which included Tithe Surveys, 1st – 3rd Edition County Series Survey, 1st – 4th Edition National Grid and land utilisation mapping) were georeferenced using QGIS 2.18.2 'Las Palmas' and shapefiles produced to provide site specific data to map the historic development of woodlands and the immediate surroundings. The Shapefiles are included within the digital appendix.
5.4 Light Detection and Ranging (LiDAR)

OpenData Light Detection and Ranging (LiDAR) data was consulted to support the historic map regression and walkover survey elements. ‘Bare-earth’ Digital Terrain Model (DTM) LiDAR tiles at a resolution of one metre were downloaded from the government site ENVIRONMENT.DATA.GOV.UK. The tiles were converted from an American Standard Code for Information Interchange (ASCII) format to a raster format using QGIS 2.18.2 ‘Las Palmas’. The tiles were merged to create a single raster layer, a slope and hillshade algorithm was then applied to create a model suitable for the analysis of the survey area and its immediate surroundings.

Four tiles were used as part of this analysis and are included within Appendix 4: Digital Archive. The ASCII tiles consulted were: se0528_DTM_1M.asc; se0529_DTM_1M.asc; se0628_DTM_1M.asc; se0629_DTM_1M.asc.

5.5 Field Survey

The field survey was undertaken on 24\textsuperscript{th} November 2016. The investigation was systematically, with each woodland parcel walked in transects. Linear features encountered such as dry-stone walls were recorded in their entirety before returning to complete a transect.

Each feature (such as earthwork banks, platforms and trackways), including any trees or ground vegetation of particular interest, were recorded in a field notebook and transcribed into an EXCEL spreadsheet (see Appendix 1). The information recorded included:

- **Grid Reference** (using a handheld Garmin GPSmap 64s)
- **Site Name**
- **Site Type** (i.e. cottage site; quarry; charcoal burning platform; trackway)
- **Description** (i.e. dimensions; interpretation)
- **Period** (i.e. prehistoric; roman; medieval; post-medieval; modern; unknown)
- **Condition/Threat** (i.e. erosion caused by livestock)
• **Recommendations** (*management suggestions*)

• **Reference** (*i.e. photographic reference; historic map reference*)

• **Importance** (*i.e. Local – Regional – National*)

### 5.6 Field Conditions

The survey was undertaken during cool, dry conditions. Due to the peaty nature of the topsoil, ground conditions were damp, and in some locations waterlogged. Access and visibility across the survey area was limited only in areas of dense holly and bramble vegetation within a woodland plantation of conifer in the north of the site, as well as around the main north-south footpath between Mixenden Green and the site of Parsley Beds.
6.0 Results

During the survey 29 features of archaeological interest were recorded across the property. The following serves to summarise the findings by period. A detailed dataset for each of the 29 recorded features can be found in Appendix 1; an enlarged copy of the map is available within Appendix 2.

![Distribution of features of archaeological interest identified during the survey.](image)

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6.1 Prehistoric

No evidence for Prehistoric activity was identified.

6.2 Romano-British

No evidence for Romano-British activity was identified.

6.3 Medieval

No evidence for Medieval activity was identified.
6.4 Post-medieval

The majority of features identified during the survey appear to relate to the post-medieval period, in particular the pattern of field enclosure and routes of access across the landscape prior to the construction of Mixenden Reservoir during the late 20th century.

6.4.1 Parsley Beds

The northern half of the Parsley Beds site is located within the property, whereas the southern half extends south beyond the property boundary. One of the earliest maps depicting the homestead is recorded on the 1847 Six-Inch Ordnance Survey (figure 4). The site was accessed from Brow Bottom Lane to the south, as well as from a footpath from the north and east. In addition a subsidiary lane linked the site with that at Mixenden Fields to the northwest. The buildings that made up the settlement (Site No. 2) have been largely removed (with the exception of small traces of foundation walls and a single rectilinear platform). Of particular interest are the remains of the now ‘grown-out’ garden hedgerows (Site No. 1 & 3) of hawthorn and holly. In addition three possible garden trees of sycamore remain at the site, two of which are multi-stemmed and possibly managed as coppice.
The homestead/cottage site of Parsley Beds (plate 1) appears to have been demolished by the time of the 1908 1:2500 1st Revision County Series Survey (figure 6), with only the garden boundary, and a single outhouse located within the northeast corner remaining. By 1919 and the publication of the 2nd Revision County Series Survey the outhouse had been removed. With the publication of the 1934 3rd Revision County Series Survey the site as a whole is no longer recorded and instead identified as part of the larger mixed woodland plantation which characterises the property today.
6.4.2 Landscaping

Plate 2: Clearance cairn located with an area of conifer plantation located within the north of the property, east of Mixenden Green. Copyright Pennine Prospects

A single clearance cairn (Site No. 20) within the north of the property and located within an area of dense conifer plantation (plate 2) first recorded on the 1934 1:2500 3rd Revision County Series Survey. The cairn consists of multiple large boulders of millstone grit, the largest of which measures approximately 1m x 1m x 1.50m in size. The feature is likely to represent either clearance work as part of the preparation for the conifer plantation in the early 20th century, or the construction of the reservoir.

6.4.3 Land Divisions and Routes of Communication

With the exception of three early field enclosure boundaries which extended west from the edge of Mixenden Reservoir at the time of the 1894 1:2500 First County Series Survey publication (figure 5), the pattern of early field enclosure is preserved within the property to varying degrees.
The earliest boundaries within the property appear to be represented by the sinuous, north-south aligned east-facing terrace (Site No. 24 & 25) boundaries (plate 3). The boundaries in question were in use until the establishment of the reservoir and the establishment of the current property boundary prior to the publication of the 1908 1\textsuperscript{st} Revision County Series Survey (figure 6). Due to the sinuous and substantial nature of the terraced boundaries (standing up to 1.30m high) it is possible the boundaries date to the late medieval period in origins.

Plate 3: *Terrace boundary (Site No. 24) traversing the gentle east-facing slope (terrace extends from the bottom left corner of the photo towards the centre right)*. Copyright Pennine Prospects

The boundaries are intersected at three locations by east-flowing streams, which have had the effect overtime of cutting broad, deep channels into the hills side on an east-west alignment.

Extending southeast from the southern end of the east-facing terrace boundary (Site No. 24) is a low, broad bank (Site No. 6) measuring up to 1m wide, 0.30m high. The feature can be traced for approximately 100m before it peters-out to the east. The
bank represents the site of boundary, which along with the east-facing terrace boundaries enclosed a rectilinear field to the east at the time of the 1847 Six-Inch Ordnance Survey (figure 4) publication. The boundary had become relict by the time of the late 1894 1:2500 First County Series Survey (figure 5).

The remaining boundaries identified within the woodland consist of irregular constructed free standing (Site No. 5, 7, 14, 17, 26 & 29) or retaining drystone walls (Site No. 4 & 5). The eastern limit of the survey is marked by the Mixenden Reservoir enclosure wall, an irregular wall bonded with cement and capped with copping stones set on edge. Of greater antiquity is the property enclosure wall (Site No. 26) at the southwestern limits of the survey area (plate 4). The irregular drystone wall (which stands in a state of decline) is located upon the eastern edge of a minor lane that extended northwest from Brow Bottom Lane towards the farm/homestead site of Mixenden Fields.

Plate 4: Boundary of the survey area (Site No. 26) also marks the eastern edge of a lane which extends northwest from Brow Bottom Lane (far distance) towards the now ruined site of Mixenden Fields. Copyright Pennine Prospects
Intersecting the survey area on a north-south alignment is the irregular drystone wall identified as Site No. 5 (plate 5). As the feature progresses north from the site of Parsley Beds (Site No. 2) the boundary changes in form from an east-facing retaining wall to a free-standing irregular drystone wall with coping stones set on edge. As a free-standing wall the feature measures c.0.50m wide and up to 1.70m high. The boundary also serves to mark the western edge of a broad level footpath (Site No. 23) recorded on the 1847 Six-Inch Ordnance Survey (figure 4) map as well as all of the subsequent historic and modern map coverage.

In addition to the main north-south trackway (Site No. 23) four additional tracks, including one in the form of a subtle east-facing terraced track (Site No. 13) extending south from the ‘Site of Farmstead’ (HER: 14743) were identified. The others included: a short stretch of Holloway (Site No. 21) located within the conifer woodland east of Mixenden Green; a terraced south-facing track (Site No. 27) measuring up to 3m wide (plate 6) and linking Mixenden Green with the reservoir to
the east; and final a footpath (Site No. 28), identified by means of LiDAR analysis (figure 8 & 9) and the available historic mapping. The track was difficult to trace on the ground, but it extends northeast from the northern end of the drystone wall boundary (Site No. 26) connecting with the main north-south track (Site No. 23) after a distance of c.200m.

Plate 6: Terraced track (Site No. 27) viewed from Mixenden Green as it extends east towards Mixenden Reservoir. Copyright Pennine Prospects

6.4.4 Water Management

Along the northern edge of the southernmost stream that enters the property from the west, a stone culvert (Site No. 10) was identified. The culvert measures c.0.70m wide and c.0.50 high. It was constructed using irregular cut local gritstone and capped with a single stone slab. Both upslope and down slope the culvert is an irregular drystone retaining wall (plate 7). Of particular interest is a laid brick surface at the foot of the stream, perhaps as an effort to prevent further natural erosion caused as a result of continued water flow.
At the summit of the terrace boundary Site No. 25 is a drainage ditch, excavated to control the flow of a minor east flowing stream and to divert it southeast, where it merges with a primary watercourses extending to the east. The ditch is steep sided and measures c.1.5m wide and 1m deep. Parallel and to the east of the ditch is a broad bank measuring c.2m wide, 0.50m high.

6.5 Unknown

6.6.1 Boundary

During the survey a possible boundary in the form of a subtle east-west oriented bank (Site No. 22) was recorded within the northeast of the survey area. The bank measures 1m wide, 0.20m high and does not appear on any the available historic and modern mapping. It is possible the feature predates the post-medieval period.
7.0 Discussion

The Yorkshire Water property surveyed to the west of Mixenden Reservoir preserves aspects of the post-medieval pattern of enclosure established prior to the construction of the reservoir during the mid-19th century. This is represented by a mixture of enclosure types characterised as earthen banks, terraces and dried stone walls. The current woodland character of the property was established in two phases during the first half of the 20th century. All of the features recorded are of local significance/interest.
8.0 Management Recommendations

As a part of this survey, identified features were assessed in regards to condition; this information has been used to formulate management recommendations. Recommendations for management are included in detail for each feature within Appendix 1. The recommendations cover only those features identified within woodland areas. The operational management of the reservoir and its subsidiary features such as access routes were beyond the scope of this investigation.

8.1 General Guidelines

Forestry operations can be detrimental to both upstanding archaeological remains and below-ground archaeological deposits. Guidelines which meet the requirements of the United Kingdom Forestry Standard (UKFS) have been published by the Forestry Commission (Forestry Commission; 2011). The reader is advised to refer to this document for further information.

The guidelines recognise:

1. Windblown trees located upon features of archaeological interest can cause considerable damage due to the uplift of root plates. Any upstanding walls or structures may also be crushed as a result of windblown trees. General root action can also be disruptive to both below and above ground archaeological features.

2. Although low-level woodland browsing can control woody vegetation within woodland pastures and clearings; overgrazing by introduced livestock can cause significant erosion to upstanding earthworks and structures. Additional measures such as fencing may be required to protect the ground around individual sites of historic importance/interest.

3. Forest operations and civil engineering activities involve heavy machinery and earth-moving equipment. These can unintentionally destroy or damage archaeological remains and veteran directly, or in-directly due to soil vibration, compaction and erosion.

4. Ground disturbance and with that potential damage or destruction to archaeological features and deposits can also be caused as a result of habitat restoration projects. This can involve the pulling out of tree stumps and the
inverting of soil layers to reduce surface nutrient content. Alternatively restocking can lead to new or additional damage to archaeological features and below-ground deposits.

5. There is considerable public interest in cultural heritage and the historic environment and interpretation of these aspects of woodlands can provide a focus for visitors. This could be achieved as part of a wider access or recreation strategy. Historic environment features can be linked by heritage trails and explained through the use of interpretative panels, leaflets or maps. However these would need to be managed to avoid negative impacts on the historic environment, such as increased erosion.

**8.2 Mitigation**

1. At the earliest stage, in advance of any management operations within areas of woodland, the organisation commissioning the works should consult with the regional historic environment authority, in this instance West Yorkshire Archaeology Adviser Service (WYAAS): [http://www.wyjas.org.uk/archaeology-advisory-service/](http://www.wyjas.org.uk/archaeology-advisory-service/); and Natural England.

2. Where an operation next to a historical feature is unavoidable, clear routes and exclusion areas should be marked out to provide protection to the monuments. Contractors could be provided with a 'cab-card', detailing in bullet-point and map format information concerning the heritage, exclusion zones and routes to and from site.

3. Regular visits to important heritage sites (such as the boundary (Site No. 5) and historic track (Site No.23); to monitor their condition will identify any new threats or damage.

4. Trees and shrubs either on or within the immediate vicinity of archaeological sites/features should be managed to limit the extent and establishment of woody vegetation. It should be considered that large trees vulnerable to windthrow be removed or crowned to reduce the weight of the tree canopy.

**8.3 Specific Guidelines**

Specific management recommendations for each feature recorded as part of the survey can be found in Appendix 1. All of the sites identified are deemed of local significance, in most cases it is felt that simple photographic and descriptive records
of what survives would be sufficient ahead of any management works. Prior to any action, Yorkshire Water should consult with West Yorkshire Archaeology Advisory Service (WYAAS) for advice at the planning stage.

The site of Parsley Beds cottage/homestead (Site No. 2) and its associated garden boundaries (Site No. 1 & 3) will require a more detailed archaeological survey and an archaeological watching brief should the site be subject to management, disturbance/damage or development.

Plate 8: Track erosion on the footpath/carriageway (Site No. 23) and boundary (Site No. 5).

If improved public access is desired, the management and clearance of scrub vegetation from the historic north-south orientated footpath/carriageway (Site No.23) and associated relict field boundary (Site No.5) between the site of Parsley Beds and Mixenden Green would offer a suitable route way through the property. It would also be advantageous to prevent the future use of quadbike/motorbikes within the woodland, the result of which has caused erosion to the tack and relict field boundary (plate 8).
9.0 Acknowledgments

Pennine Prospects would like to thank Yorkshire Water, in particular Geoff Lomas, Catchment and Recreation Manager for their support and enthusiasm of the Celebrating Our Woodland Heritage Project.

We would also like to thank the staff of West Yorkshire Archaeological Advisory Service Historic Environment Record for their provision of data relating to Graincliffe Reservoir and the wider region of Bingley, West Yorkshire.
10.0 Bibliography

Online Resources

MAGIC geographic information
Accessed: 09/12/2016
URL: http://www.magic.gov.uk/MagicMap.aspx

United Kingdom Soil Observatory Soils map viewer
Accessed: 09/12/2016
URL: http://mapapps2.bgs.ac.uk/ukso/home.html

Accessed 09/12/2016
URL: http://www.landis.org.uk/services/soilsguide/soilscapes.cfm?ssid=19

British Geological Survey, Geology of Britain Viewer
Accessed: 09/12/2016
URL: http://mapapps.bgs.ac.uk/geologyofbritain/home.html

Published Resources


Celebrating Our Woodland Heritage Mixenden Reservoir: 
An Archaeological Woodland Survey


11.0 List of illustrations

Tables

Table 1: List detailing the known archaeological records both within the property and within the 350 metres buffer zone.

Figures

Figure 1: Location of Mixenden Reservoir in relation to the wider region. Contains OS data © Crown copyright and database right (2017)

Figure 2: Location and extent of the of the Mixenden Reservoir survey (centre), Ovenden, West Yorkshire. Previously recorded features and monuments are also displayed. Contains OS data © Crown copyright and database right (2017)

Figure 3: Excerpt of the County of York Surveyed in (1772) MDCCCLXVII, VIII, IX, and MDCCCLXX Engraved by Thomas Jefferys (Sheet V). The dispersed nature of settlement in Mixenden is sticking compared to neighbouring Illingworth. Copyright © The British Library Board

Figure 4: Pattern of enclosure at Mixenden Reservoir reproduced from the 1847 Six-Inch Ordnance Survey. Copyright Pennine Prospects

Figure 5: Pattern of enclosure at Mixenden Reservoir reproduced from the 1894 First County Series Survey. Copyright Pennine Prospects

Figure 6: Pattern of enclosure at Mixenden Reservoir reproduced from the 1st Revision First County Series Survey. Copyright Pennine Prospects

Figure 7: Pattern of enclosure at Mixenden Reservoir reproduced from the 1934 3rd Revision First County Series Survey. Copyright Pennine Prospects

Figure 8: LiDAR DTM slope model revealing subtle linear features such as tracks and boundaries within the survey area (centre).

Figure 9: Comparative LiDAR Hillshade DTM model including the location of surveyed features.

Figure 10: Distribution of features of archaeological interest identified during the survey. Copyright Pennine Prospects

Plates

Plate 1: The site of Parsley Beds homestead/cottage has been almost entirely removed. Three garden sycamores (foreground) and the planted mixed hawthorn and holly hedgerow (background) survive. Copyright Pennine prospects
Plate 2: Clearance cairn located with an area of conifer plantation located within the north of the property, east of Mixenden Green. Copyright Pennine Prospects

Plate 3: Terrace boundary (Site No. 24) traversing the gentle east-facing slope (terrace extends from the bottom left corner of the photo towards the centre right). Copyright Pennine Prospects

Plate 4: Boundary of the survey area (Site No. 26) also marks the eastern edge of a lane which extends northwest from Brow Bottom Lane (far distance) towards the now ruined site of Mixenden Fields. Copyright Pennine Prospects

Plate 5: Low remains of the east-facing retaining boundary Site No.5 (left) with the overgrown level track Site No.23 (right). Copyright Pennine Prospects

Plate 6: Terraced track (Site No. 27) viewed from Mixenden Green as it extends east towards Mixenden Reservoir. Copyright Pennine Prospects

Plate 7: Drystone constructed culvert (Site No. 10) including the flanking retaining walls. Copyright Pennine Prospects

Plate 8: Track erosion on the footpath/carriageway (Site No. 23) and boundary (Site No. 5). Copyright Pennine Prospects
## Appendix 1: Survey Database

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<th>Site No.</th>
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<td>4058</td>
<td>41 4286 15</td>
<td>Boundary</td>
<td>Hedgerow</td>
<td>Relict property boundary consisting of a planted holly and hawthorn hedgerow. The boundary is orientated north-south and formed part of a series of small gardens and cottages known as Parsley Beds on the 1894 First County Series Survey.</td>
<td>Post-medieval</td>
<td>The hedgerow is unmanaged; as a result it is overgrown with sapling growth expanding to the east and west.</td>
<td>Any management of the woodland should seek to preserve the relict hedgerows for their representation of an early garden. The boundary also serves as a habitat for bird populations</td>
<td>Photographic Reference: IMG_6943, IMG_6944; Map Reference: 1894 1:2500 First County Series Survey</td>
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<td>Relict property boundary consisting of a planted holly and hawthorn hedgerow. The boundary is orientated north-south and formed part of a series of small</td>
<td>Post-medieval</td>
<td>The hedgerow is unmanaged; as a result it is overgrown with sapling growth expanding to the east and west.</td>
<td>Any management of the woodland should seek to preserve the relict hedgerows for their representation of an early garden. The boundary also serves as a habitat for bird populations</td>
<td>Photographic Reference: IMG_6943, IMG_6944; Map Reference: 1894 1:2500 First County Series Survey</td>
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<td></td>
<td>Site of Parsley Beds cottages and gardens within the southwest corner of Mixenden wood. At least two platforms are visible within the area along with two garden trees of sycamore manged as a coppice and pollard. Planted hedgerows of holly and hawthorn also survive.</td>
<td>Post-medieval</td>
<td>The southern boundary of the Yorkshire Water boundary splits the site between north and south. Subtle earthworks represent cottage sites. With the exception of the relict hedgerows, ground vegetation is largely subdued by sycamore and beech tree litter. The site is susceptible to fly tipping.</td>
<td>Fly-tipping across the site should be discouraged. The platforms could benefit with the management of brambles to prevent further spread. Ahead of any ground works/management in the future the site could benefit from a more detailed archaeological survey to record the full extent of the remains.</td>
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<td>Relict property boundary consisting of a planted holly and hawthorn hedgerow. The boundary is orientated north-south and formed part of a series of small gardens and cottages known as Parsley Beds on the 1894 First County Series Survey.</td>
<td>The hedgerow is unmanaged, as a result it is overgrown with sapling growth expanding to the east and west.</td>
<td>Any management of the woodland should seek to preserve the relict hedgerows for their representation of an early garden. The boundary also serves as a habitat for bird populations.</td>
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<td>An east-west orientated, south-facing terrace measuring up to 0.80m high. The feature represents the site of an overgrown, partially demolished irregular drystone wall. At its eastern end the boundary redirects south, forming the western edge of a north-south orientated carriageway. To the west the boundary links with the woodland boundary. The south-facing terrace boundary serves to separate a predominantly beech</td>
<td>Post-medieval</td>
<td>At the summit of the boundary a number of mature beech are present. The predominant vegetation consists of grasses.</td>
<td>The beech vegetation above the feature should be monitored and action taken to prevent any windblown damage.</td>
<td>IMG_6951; Map Reference: 1894 1:2500 First County Series Survey</td>
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An east-west orientated, south-facing terrace measuring up to 0.80m high. The feature represents the site of an overgrown, partially demolished irregular drystone wall.  
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At the summit of the boundary a number of mature beech are present. The predominant vegetation consists of grasses.  
The beech vegetation above the feature should be monitored and action taken to prevent any windblown damage.  
Photographic Reference: IMG_6951; Map Reference: 1894 1:2500 First County Series Survey  
Local  
Report No: PP4/130417

Celebrating Our Woodland Heritage Mixenden Reservoir:  
An Archaeological Woodland Survey
At its eastern end the boundary redirects south, forming the western edge of a north-south orientated carriageway. To the west the boundary links with the woodland boundary. The south-facing terrace boundary serves to separate a predominantly beech plantation to the north from a mixed wetland plantation to the south.

| 4 | 4058 00 | 4827 20 | Boundary | Terrace | Post-medieval | At the summit of the boundary a number of mature beech are present. The beech vegetation above the feature should be monitored and action taken to prevent any windblown damage. | Photographic Reference: IMG_6951; Map Reference: 1894 1:2500 First County Series Survey | Local |
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predominant vegetation consists of grasses.
### Boundary Irregular Drystone Wall

A north-south orientated irregular drystone wall. The boundary which survives largely as an east-facing retaining wall marks the western edge of a carriage way that intersects the woodland, connecting the site of Parsley Beds to the south with the farm of Mixenden Green to the north. Within the north the boundary survives to its full extent and supports copping stones set on edge. The wall stands c.0.50m wide and up to 1.70m high.

### Post-medieval

The condition of the wall varies along its course, with extended areas where the wall is absent. Erosion to the feature is largely natural, with the exception of one location (NGR: 405762 428866) where damage has been caused by the recreational use of quad bikes and motorbikes should be discouraged to prevent further damage to the wall and to improve ground conditions.

The feature should be monitored for further erosion caused by vegetation and use of vehicles. Management of the vegetation immediately on the wall and the carriageway to the west is encouraged in order to improve public access. The recreational use of quad bikes and motorbikes should be discouraged to prevent further damage to the wall and to improve ground conditions.

### Photographic Reference:
- IMG_6954
- IMG_6957
- IMG_6958
- IMG_6959
- IMG_6960
- IMG_6962
- IMG_7003
- IMG_7004

### Map Reference:
1894 1:2500 First County Series Survey

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Report No: PP4/130417
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<td>A north-south orientated irregular drystone wall. The boundary which survives largely as an east-facing retaining wall marks the western edge of a carriage way that intersects the woodland, connecting the site of Parsley Beds to the south with the farm of Mixenden Green to the north. Within the north the boundary survives to its full extent and supports coping stones set on edge. The wall stands c.0.50m wide</td>
<td>The condition of the wall varies along its course, with extended areas where the wall is absent. Erosion to the feature is largely natural, with the exception of one location (NGR: 405762 428866) where damage has been caused by the recreational use of quad bikes. Vegetation varies from mature conifer, beech,</td>
<td>The feature should be monitored for further erosion caused by vegetation and use of vehicles. Management of the vegetation immediately on the wall and the carriageway to the west is encouraged in order to improve public access. The recreational use of quad bikes and motorbikes should be discouraged to prevent further damage to the wall and to improve ground conditions.</td>
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and up to 1.70m high. sycamore and holly, to bracken, fern, brambles and grasses.

<p>| 5 | 4057 99 | 4288 12 | Boundary | Irregular Drystone Wall | A north-south orientated irregular drystone wall. The boundary which survives largely as an east-facing retaining wall marks the western edge of a carriage way that intersects the woodland, connecting the site of Parsley Beds to the south with the farm of Mixenden Green to the north. Within the north the boundary survives to its full extent and supports copping stones. Post-medieval The condition of the wall varies along its course, with extended areas where the wall is absent. Erosion to the feature is largely natural, with the exception of one location (NGR: 405762 428866) where damage has been caused by the recreational use of quad bikes. Vegetation varies from The feature should be monitored for further erosion caused by vegetation and use of vehicles. Management of the vegetation immediately on the wall and the carriageway to the west is encouraged in order to improve public access. The recreational use of quad bikes and motorbikes should be discouraged to prevent further damage to the wall and to improve ground conditions. Photographic Reference: IMG_6954, IMG_6957, IMG_6958, IMG_6959, IMG_6960, IMG_6962, IMG_7003, IMG_7004; Map Reference: 1894 1:2500 First County Series Survey Local |</p>
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| 5   | Irregular | A north-south orientated irregular drystone wall. The boundary which survives largely as an east-facing retaining wall marks the western edge of a carriage way that intersects the woodland, connecting the site of Parsley Beds to the south with the farm of Mixenden Green to the north. Within the north the boundary survives to its full extent and | Post-medieval | The condition of the wall varies along its course, with extended areas where the wall is absent. Erosion to the feature is largely natural, with the exception of one location (NGR: 405762 428866) where damage has been caused by the recreational use of quad bikes. The feature should be monitored for further erosion caused by vegetation and use of vehicles. Management of the vegetation immediately on the wall and the carriageway to the west is encouraged in order to improve public access. The recreational use of quad bikes and motorbikes should be discouraged to prevent further damage to the wall and to improve ground conditions. |}

Photographic Reference: IMG_6954, IMG_6957, IMG_6958, IMG_6959, IMG_6960, IMG_6962, IMG_7003, IMG_7004; Map Reference: 1894 1:2500 First County Series Survey

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<th>4287 55</th>
<th>Boundar y</th>
<th>Irregular Drystone Wall</th>
<th>Post-medieval</th>
<th>Vegetation varies from mature conifer, beech, sycamore and holly, to bracken, fern, brambles and grasses.</th>
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<td>A north-south orientated irregular drystone wall. The boundary which survives largely as an east-facing retaining wall marks the western edge of a carriage way that intersects the woodland, connecting the site of Parsley Beds to the south with the farm of Mixenden Green to the north. Within the north the boundary</td>
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<td>The condition of the wall varies along its course, with extended areas where the wall is absent. Erosion to the feature is largely natural, with the exception of one location (NGR: 405762 428866) where damage has been caused by the recreational use of quad bikes and motorbikes which should be discouraged to prevent further damage to the wall and to improve ground conditions.</td>
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survives to its full extent and supports copping stones set on edge. The wall stands c.0.50m wide and up to 1.70m high.

use of quad bikes. Vegetation varies from mature conifer, beech, sycamore and holly, to bracken, fern, brambles and grasses.

<table>
<thead>
<tr>
<th>6</th>
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<th>Boundary Bank</th>
<th>Broad, subtle, curvilinear bank oriented northwest-southeast. The feature measures c.1m wide, 0.30m high. The boundary is lined by two mature beech.</th>
<th>Post-medieval</th>
<th>The feature is subtle and partially masked by beech leaf litter which subdues any undergrowth.</th>
<th>Monitor the feature.</th>
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<td>The feature is subtle and partially masked by beech leaf litter which subdues any undergrowth.</td>
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<td>Post-medieval</td>
<td>The feature is subtle and partially masked by beech leaf litter which subdues any undergrowth.</td>
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<td>Broad, subtle, curvilinear bank oriented northwest-southeast. The feature measures c.1m wide, 0.30m high. The boundary is lined by two mature beech.</td>
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<td>The feature is subtle and partially masked by beech leaf litter which subdues any undergrowth.</td>
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<td>Photographic Reference: IMG_6966; Map Reference: 1894 1:2500 First County Series Survey</td>
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<td>Boundary Terrace</td>
<td>East-facing terrace boundary c.0.30m high. Irregular stone arranged at summit of terrace suggests it once supported a</td>
<td>Post-medieval</td>
<td>The feature is in a fair condition and located within an area of beech and sycamore woodland.</td>
<td>Monitor the feature.</td>
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<td>4288 09</td>
<td>Boundary Terrace</td>
<td>East-facing terrace boundary c.0.30m high. Irregular stone arranged at summit of terrace suggests it once supported a drystone wall. The boundary can be traced for a distance of c.20m.</td>
<td>Post-medieval</td>
<td>Fair</td>
<td>Within an area of beech and sycamore woodland.</td>
<td>Monitor the feature. Photographic Reference: IMG_6967; Map Reference: 1894 1:2500 First County Series Survey</td>
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<td>4056 63</td>
<td>4288 47</td>
<td>Veteran Tree</td>
<td>A mature holly and hawthorn tree stand at this location. The 1894 1:2500 First County Series records a tree at this location on the juncture between a field located outside of the</td>
<td>Post-medieval</td>
<td>Mature Holly and Hawthorn</td>
<td>Maintain</td>
<td>Photographic Reference: IMG_6968; Map Reference: 1894 1:2500 First County Series Survey</td>
<td></td>
</tr>
</tbody>
</table>

Report No: PP4/130417
woodland to the west and a north-south orientated field boundary (now located within the woodland plantation.

<p>| | | | | | | | |</p>
<table>
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</thead>
<tbody>
<tr>
<td>9</td>
<td>4056 84</td>
<td>4288 96</td>
<td>Quarry</td>
<td>A possible quarry oriented east-west. The feature is roughly rectangular and cuts an earlier field boundary terrace and extends west towards the present woodland edge. It measures c.12m long and 0.30m deep.</td>
<td>Post-medieval</td>
<td>The feature is distinct and marked by mature beech trees upon its edges.</td>
<td>Monitor the feature.</td>
</tr>
<tr>
<td>10</td>
<td>4056 85</td>
<td>4289 37</td>
<td>Culvert</td>
<td>Stone built culvert and supporting retaining wall of irregular drystone construction upon the northern edge of an east-flowing watercourse. The base of the stream has been lined with laid bricks. The drain outlet measures 0.70m wide and 0.50m high. It is constructed of local gritstone and is capped by a stone slab lintel.</td>
<td>Post-medieval</td>
<td>Woodland fern and grasses are supported by the structure. In addition beech saplings have also established themselves on the structure, threatening its structural integrity.</td>
<td>The drain lintel stone would benefit from repair. Beech sapling growth should be discouraged and removed where appropriate.</td>
</tr>
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<td>---</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>4057 11 4289 48</td>
<td>Saw Pit?</td>
<td>A possible saw pit manipulated to construct an obstacle for bikers. The feature is orientated north-south and measures c.3m long, 1m wide and 0.40m deep. Spoil is located on both its east and west sides and measures c.1.5m wide, 0.3m high and 3m long.</td>
<td>Post-medieval</td>
<td>The feature is in a good condition and located within a woodland clearing.</td>
<td>Monitor the feature.</td>
<td>Photographic Reference: IMG_6980</td>
</tr>
</tbody>
</table>

| 12 | 4057 36 4291 66 | Trackway Holloway | Track consisting of a north-facing terrace up to 0.90m high. To the north the feature lies outside of the survey area where its edge is marked by a drystone wall. The terrace is lined with mature beech trees. The track formed | Post-medieval | The feature is in good condition and located within an area of beech woodland. | Monitor the feature. | Photographic Reference: IMG_6993; Map Reference: 1894 1:2500 First County Series Survey |

Report No: PP4/130417
<table>
<thead>
<tr>
<th>No</th>
<th>Coordinates</th>
<th>Description</th>
<th>State</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>405702 429163</td>
<td>Trackway Holloway&lt;br&gt;Track consisting of a north-facing terrace up to 0.90m high. To the north the feature lies outside of the survey area where its edge is marked by a drystone wall. The terrace is lined with mature beech trees. The track formed part of the original course of Hays Lane, connecting Mixenden Green with 'Site of Farmstead' (HER: 14743).</td>
<td>Post-medieval</td>
<td>Monitor the feature. Photographic Reference: IMG_6993; Map Reference: 1894 1:2500 First County Series Survey</td>
</tr>
<tr>
<td>13</td>
<td>405704</td>
<td>429159</td>
<td>Trackway</td>
<td>Footpath</td>
</tr>
<tr>
<td>Trackway</td>
<td>Footpath</td>
<td>Subtle north-south orientated sinuous trackway set into gentle east-facing slope. The feature measures no more than 1m wide and is traceable for approximately 30m before it peters out. To the north the track connects with the farm/homestead 'Site of Farmstead' (HER: 14743) recorded on the 1894 1:2500 First County Series Survey.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-medieval</td>
<td>The feature is in a good condition and located within an area of predominate beech woodland.</td>
<td>Monitor the feature.</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4057 19</td>
<td>4290 65</td>
<td>Boundary Irregular Drystone Wall</td>
<td>Foundations of irregular drystone field boundary wall recorded on 1894 1:2500 First County Series Survey. The wall measures c.0.50m wide and extends north from an east flowing stream. To the north the wall peters out after c.35m.</td>
</tr>
<tr>
<td>Trackway</td>
<td>Holloway</td>
<td>Holloway (possibly modern) extending south from a barn. The feature measures between 3m wide (north) to 1m wide (south) and up to 1.5m deep.</td>
<td>Moder n</td>
<td>The feature is in good condition. Upon its eastern edge is a conifer hedge and wire fence. The western edge opens into the beech woodland.</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td>Trackway</td>
<td>Platform</td>
<td>A north-south orientated platform measuring approx. 5m long and 2m wide. The feature is cut into the east-facing slope.</td>
<td>Post-medieval</td>
<td>The feature is in a fair condition and located within an area of beech and sycamore woodland.</td>
</tr>
</tbody>
</table>
Boundar y | Irregular Drystone Wall | Foundations of irregular drystone field boundary wall recorded on 1894 1:2500 First County Series Survey. The wall extends east, downslope from a north-south relict field boundary. This feature measure c.0.40m wide and stands no more than 0.2m high. The boundary is traceable for roughly 20m before it redirects north and peters out at the foot of a mature sycamore. | The feature is in a poor condition due to the removal of the majority of wall material. It is possible the feature continues further east than is visible on the ground. | Monitor the feature. Any development/management of the woodland in the area should avoid the use of heavy machinery to avoid erosion/destruction of the feature. | Photographic Reference: IMG_6997, IMG_6998; Map Reference: 1894 1:2500 First County Series Survey | Local
| 17 | 4057 45 | 4290 67 | Boundary | Irregular Drystone Wall | Foundations of irregular drystone field boundary wall recorded on 1894 1:2500 First County Series Survey. The wall extends east, downslope from a north-south relict field boundary. This feature measure c.0.40m wide and stands no more than 0.2m high. The boundary is traceable for roughly 20m before it redirects north and peters out at the foot of a mature sycamore. | Post-medieval | The feature is in a poor condition due to the removal of the majority of wall material. It is possible the feature continues further east than is visible on the ground. | Monitor the feature. Any development/management of the woodland in the area should avoid the use of heavy machinery to avoid erosion/destruction of the feature. | Photographic Reference: IMG_6997, IMG_6998; Map Reference: 1894 1:2500 First County Series Survey | Local |
| 18 | 4057 44 | 4289 20 | Spoil Mound | An area measuring approximately 10m x 4m containing multiple low circular mounds of stone and earth. They appear to represent spoil heaps, likely attributed to works on the neighbouring watercourse. | Modern | Spoil heaps in good condition and overgrown with fern and wetland grasses. The area represents a small but good woodland habitat and grazing area for deer. | Monitor and maintain area as an open woodland clearing. Prevent the establishment of beech and sycamore saplings. | Photographic Reference: IMG_7000 | Local |

<p>| 19 | 4058 08 | 4290 63 | Boundary Bank and Ditch | Bank and ditch extending northeast from property boundary. The ditch measures 1.50m wide, 0.20m deep. The bank is located on the east side of the ditch and stands 0.50m wide, 0.10m high. | Post-medieval | Feature in a good condition, located within a predominant ly conifer plantation. Brambles obscure part of the feature | Monitor the feature. Control bramble vegetation to prevent further spread. Any development/management of the woodland in the area should avoid the use of heavy machinery to avoid erosion/destruction of the feature. | Local |
| 19 | 4058 28 | 4290 92 | Boundary | Bank and Ditch | Bank and ditch extending northeast from property boundary. The ditch measures 1.50m wide, 0.20m deep. The bank is located on the east side of the ditch and stands 0.50m wide, 0.10m high. | Post-medieval | Feature in a good condition, located within a predominantly conifer plantation. Brambles obscure part of the feature. | Monitor the feature. Control bramble vegetation to prevent further spread. Any development/management of the woodland in the area should avoid the use of heavy machinery to avoid erosion/destruction of the feature. | Local |
| 20 | 4059 12 | 4291 93 | Cairn | Linear cairn orientated north-south. The feature measures approximately 12m long and 3m wide. The largest stone measures 1m x 1m x 1.50m in size. The feature was constructed as a clearance cairn. | Post-medieval | Feature is in good condition and located within a conifer plantation. | Monitor the feature. | Photographic Reference: IMG_7013 | Local |
| 21 | 4058 53 | 4291 44 | Trackway Holloway | An east-west orientated holloway measuring up to 2m wide and 1m deep. The feature peters out the east, next to the public foot path on the edge of a plantation of conifer wood. The feature measures approximately 50m long. | Post-medieval | Feature is in good condition and located within a conifer plantation. | Monitor the feature | Photographic Reference: IMG_7015 | Local |
| 21 | 4058 75 | 4291 35 | Trackway Holloway | An east-west orientated holloway measuring up to 2m wide and 1m deep. The feature peters out the east, next to the public foot path on the edge of a plantation of conifer wood. The feature measures approximately 50m long. | Post-medieval | Feature is in good condition and located within a conifer plantation. | Monitor the feature | Photographic Reference: IMG_7015 | Local |</p>
<table>
<thead>
<tr>
<th>21</th>
<th>4058 92</th>
<th>4291 28</th>
<th>Trackway Holloway</th>
<th>An east-west orientated holloway measuring up to 2m wide and 1m deep. The feature peters out the east, next to the public foot path through the woodland.</th>
<th>Post-medieval</th>
<th>Feature is in good condition and located within a conifer plantation.</th>
<th>Monitor the feature</th>
<th>Photographic Reference: IMG_7015</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>4058 54</td>
<td>4289 97</td>
<td>Boundary Bank</td>
<td>Possible boundary bank orientated east west and measuring 1m wide 0.20m high.</td>
<td>Post-medieval</td>
<td>The feature is in a fair condition and located within an area of mixed conifer and deciduous plantation. Ground vegetation of brambles and bracken obscure the feature at its western end.</td>
<td>Monitor the feature. Any development/management of the woodland in the area should avoid the use of heavy machinery to avoid erosion/destruction of the feature. Clearance of the brambles and bracken would help to identify the features full extent.</td>
<td>Photographic Reference: IMG_7017</td>
<td>Local</td>
</tr>
<tr>
<td>22</td>
<td>4058 26</td>
<td>4290 07</td>
<td>Boundary Bank</td>
<td>Possible boundary bank orientated east west and measuring 1m wide 0.20m high.</td>
<td>Post-medieval</td>
<td>The feature is in a fair condition and located within an area of mixed conifer and deciduous plantation. Ground vegetation of brambles and bracken obscure the feature at its western end.</td>
<td>Monitor the feature. Any development/management of the woodland in the area should avoid the use of heavy machinery to avoid erosion/destruction of the feature. Clearance of the brambles and bracken would help to identify the features full extent.</td>
<td>Photographic Reference: IMG_7017</td>
<td>Local</td>
</tr>
<tr>
<td>23</td>
<td>4058 31</td>
<td>4286 39</td>
<td>Trackway Carriage way</td>
<td>North-south orientated trackway or carriage way that extends north from the site of Parsley Beds to the farm of Mixenden Green. The feature measures up to 4m wide. Upon its eastern edge is the remains of a planted holly hedge. Its western edge is</td>
<td>Post-medieval</td>
<td>The condition of the feature varies from good to poor. In places it has been eroded by the east flowing water courses or is lost under the spread of holly vegetation.</td>
<td>The feature would benefit from vegetation clearance as a means of reinstating the route as an effect trackway through the woodland for use by the public.</td>
<td>Photographic Reference: IMG_6947, IMG_6948, IMG_6959; Map Reference: 1894 1:2500 First County Series Survey</td>
<td>Local</td>
</tr>
<tr>
<td>Site No.</td>
<td>Grid Ref.</td>
<td>Feature Type</td>
<td>Feature Description</td>
<td>Date</td>
<td>Condition</td>
<td>Recommendation</td>
<td>Reference</td>
<td>Survey</td>
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</tr>
<tr>
<td>23</td>
<td>4057 93</td>
<td>Trackway</td>
<td>North-south orientated trackway or carriage way that extends north from the site of Parsley Beds to the farm of Mixenden Green. The feature measures up to 4m wide. Upon its eastern edge is the remains of a planted holly hedge. Its western edge is marked by a drystone wall.</td>
<td>Post-medieval</td>
<td>Good to Poor</td>
<td>The feature would benefit from vegetation clearance as a means of reinstating the route as an effect trackway through the woodland for use by the public.</td>
<td>Photographic Reference: IMG_6947, IMG_6948, IMG_6959; Map Reference: 1894 1:2500 First County Series Survey</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>4056 64</td>
<td>Boundary</td>
<td>Sinuous boundary consisting of an east-facing terrace c.1.3m high. The feature is recorded on the 1894 1:2500 County Survey.</td>
<td>Post-medieval</td>
<td>In Good Condition</td>
<td>Monitor the feature. Some thinning of the beech and sycamore would encourage additional ground flora.</td>
<td>Photographic Reference: IMG_6973; Map Reference: 1894 1:2500 First County Series Survey</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>405701</td>
<td>428926</td>
<td>Boundary</td>
<td>Terrace</td>
<td>Post-medieval</td>
<td>The feature is in good condition. It is located within an area of predominant ly beech and sycamore</td>
<td>Monitor the feature. Some thinning of the beech and sycamore would encourage additional ground flora.</td>
<td>Photographic Reference: IMG_6973; Map Reference: 1894 1:2500 First County Series Survey</td>
<td>Local</td>
</tr>
</tbody>
</table>
1:2500 County Series Survey and represents a relict boundary, made obsolete when the current property boundary was established prior to 1908. The boundary is orientated northeast-southwest. To the south the boundary begins at the current woodland edge. To the north it terminates on the southern edge of an east-flowing stream. Woodland. With the exception of limited fern vegetation, growth is subdued by leaf litter.
Sinuous boundary orientated roughly north-south between two east flowing watercourses. As the feature extends north it changes in form from a steep sided ditch (c.1.5m wide and 1m deep). Parallel and to the east is a broad bank measuring c.2m wide, 0.50m high. The feature peters-out to the north at the summit of an east-facing terrace. The terrace supports a single mature oak, one of three recorded on the 1894 1:2500 First County Series Survey. To the

The boundary varies from good to poor. Its condition is poorest at its northern end due to erosion caused by vehicle access and waterlogging. Vegetation is predominantly of mature beech and sycamore and beech sapling. A single mature oak and at least two holly trees are located midway along the feature.

The feature should be monitored to prevent further erosion caused by the establishment of beech and sycamore saplings and to encourage additional ground flora by thinning the woodland canopy. Thinning of immediate vegetation around the single oak will encourage its growth. Vehicle access should be restricted to prevent further erosion and damage to the boundary and establishment of wetland habitat.

Photographic Reference: IMG_6982, IMG_6984, IMG_6989, IMG_6990; Map Reference: 1894 1:2500 First County Series Survey

Local
north the foundations of a drystone wall can be traced from the terrace down to the east-flowing stream. It is considerably eroded at this location due to the waterlogged conditions and vehicle access.

25

4056 4289
88 93

Boundary Terrace Sinuous boundary orientated roughly north-south between two east flowing watercourses. As the feature extends north it changes in form from a steep sided ditch (c.1.5m wide and 1m deep). Parallel and to the east is a broad bank measuring c.2m wide, 0.50m

Post-medieval

The boundary varies from good to poor. Its condition is poorest at its northern end due to erosion caused by vehicle access and waterlogging. Vegetation is predominantly of mature beech and sycamore

The feature should be monitored to prevent further erosion caused by the establishment of beech and sycamore saplings and to encourage additional ground flora by thinning the woodland canopy. Thinning of immediate vegetation around the single oak will encourage its growth. Vehicle access should be restricted to prevent further erosion and

Photographic Reference: IMG_6982, IMG_6984, IMG_6989, IMG_6990; Map Reference: 1894 1:2500 First County Series Survey

Local
| high. The feature peters-out to the north at the summit of an east-facing terrace. The terrace supports a single mature oak, one of three recorded on the 1894 1:2500 First County Series Survey. To the north the foundations of a drystone wall can be traced from the terrace down to the east-flowing stream. It is considerably eroded at this location due to the waterlogged conditions and vehicle access. | and beech sapling. A single mature oak and at least two holly trees are located midway along the feature. | damage to the boundary and establishment of wetland habitat. |
Boundary

Sinuous boundary orientated roughly north-south between two east flowing watercourses. As the feature extends north it changes in form from a steep sided ditch (c.1.5m wide and 1m deep). Parallel and to the east is a broad bank measuring c.2m wide, 0.50m high. The feature peters-out to the north at the summit of an east-facing terrace. The terrace supports a single mature oak, one of three recorded on the 1894 1:2500 First County Series Survey. To the

Post-medieval

The boundary varies from good to poor. Its condition is poorest at its northern end due to erosion caused by vehicle access and waterlogging. Vegetation is predominant ly of mature beech and sycamore and beech sapling. A single mature oak and at least two holly trees are located midway along the feature.

The feature should be monitored to prevent further erosion caused by the establishment of beech and sycamore saplings and to encourage additional ground flora by thinning the woodland canopy. Thinning of immediate vegetation around the single oak will encourage its growth. Vehicle access should be restricted to prevent further erosion and damage to the boundary and establishment of wetland habitat.

Photographic Reference: IMG_6982, IMG_6984, IMG_6989, IMG_6990; Map Reference: 1894 1:2500 First County Series Survey

Local
Celebrating Our Woodland Heritage Mixenden Reservoir:
An Archaeological Woodland Survey

| 26 | 4058 4286 | Boundary | Irregular Drystone Wall | Partially collapsed irregular drystone wall orientated northwest-southeast. The relict field boundary marks the western limit of the property and woodland. The wall stands up to 1m high and 0.40m wide. He wall marked the eastern edge of track which Post-medieval | The boundary is in a good to fair condition. Sections of the wall are masked by scrub undergrowth, holly and hawthorn. The feature should be monitored and the vegetation controlled to prevent further damage caused by wind throw events and root action. | Photographic Reference: IMG_6949, IMG_6950 Map Reference: 1894 1:2500 First County Series Survey | Local |
Celebrating Our Woodland Heritage Mixenden Reservoir:  
An Archaeological Woodland Survey

| 26 | 4057 | 4287 | Boundar y | Irregular Drystone Wall | Partially collapsed irregular drystone wall orientated northwest-southeast. The relict field boundary marks the western limit of the property and woodland. The wall stands up to 1m high and 0.40m wide. He wall marked the eastern edge of track which | Post-medie val | The boundary is in a good to fair condition. Sections of the wall are masked by scrub undergrowth, holly and hawthorn. The feature should be monitored and the vegetation controlled to prevent further damage caused by wind throw events and root action. |

Photographic Reference: IMG_6949, IMG_6950  
Map Reference: 1894 1:2500  
First County Series Survey  
Local | | | | | | | |
Brow Bottom Lane to the south, with the farm/homestead of Mixenden Fields to the northwest.

<table>
<thead>
<tr>
<th>No</th>
<th>Grid Ref</th>
<th>Length</th>
<th>Feature Type</th>
<th>Description</th>
<th>Condition</th>
<th>Monitoring</th>
<th>Photographic Reference</th>
<th>Map Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>4058 55</td>
<td>4291 03</td>
<td>Trackway/ Footpath</td>
<td>Linear terraced track extending southeast from Mixenden Green towards the reservoir. The track is recorded as a foot path on the 1847 six-inch Ordnance Survey, after which it is depicted as representing a field division. The terraced track is south-facing and measures c.3m wide. Parallel to its northern edge are foundations of an irregular drystone wall. The feature demarcates an area of Post-medieval usage.</td>
<td>Good</td>
<td>Monitor the feature</td>
<td>IMG_7005, IMG_7006, IMG_7007; Map Reference: 1847 Ordnance Survey Six-Inch England and Wales, Yorkshire 215</td>
<td>Local</td>
</tr>
</tbody>
</table>
### Celebrating Our Woodland Heritage Mixenden Reservoir: An Archaeological Woodland Survey

<table>
<thead>
<tr>
<th>Trackway</th>
<th>Footpath</th>
<th>Line of Evidence</th>
<th>Condition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear trackway oriented northeast-southwest recorded on the 1847 six-inch Ordnance Survey and subsequent historic maps. The feature was identified as a result of analysis of the 1m resolution LiDAR DTM. The feature enters the woodland from the southwest and links with a primary north-south orientated footpath to the northeast.</td>
<td>Monitor the feature</td>
<td>Map Reference: 1847 Ordnance Survey Six-Inch England and Wales, Yorkshire 215; LiDAR Reference: se0528_DTM_1M.asc</td>
<td>Post-medieval</td>
<td>The trackway is in a fair to poor condition and was difficult to identify on the ground during the survey. The feature runs through an area of predominately beech woodland with some conifer. Dense understory of brambles and holly also mask its course.</td>
</tr>
<tr>
<td>29</td>
<td>4059 16</td>
<td>4292 08</td>
<td>Boundary</td>
<td>Irregular Drystone Wall</td>
</tr>
<tr>
<td>29</td>
<td>4058 84</td>
<td>4292 03</td>
<td>Boundary</td>
<td>Irregular Drystone Wall</td>
</tr>
</tbody>
</table>
Appendix 2: Distribution Map

Legend
- Scheduled Monument
- WYAAAS HER Monuments
- Survey Area
- Road
- Building
- Woodland
- Water

Yorkshire Water boundary data provided by Yorkshire Water.
HER Data provided by West Yorkshire Archaeology Advisory Service.
Contains OS data © Crown copyright and database right (2017).
© Historic England [2017]. Contains Ordnance Survey data © Crown
copyright and database right [2017].
Appendix 3: Historic Mapping

Pattern of enclosure at Mixenden Reservoir reproduced from the 1847 Six-Inch Ordnance Survey.

Legend
- Survey Area
- Water
- Field
- Garden
- Structure
- Woodland

Yorkshire Water boundary data provided by Yorkshire Water.
Map based on the 1847 Six-Inch Ordnance Survey.
Contains OS data © Crown copyright and database right (2017).
Pattern of enclosure at Mixenden Reservoir reproduced from the 1894 First County Series Survey.

Legend
- Survey Area
- Water
- Field
- Garden
- Playground
- Structure
- Woodland

Yorkshire Water boundary data provided by Yorkshire Water.
Map based on the 1894 First County Series Survey.
Contains OS data © Crown copyright and database right (2017).
Pattern of enclosure at Mixenden Reservoir reproduced from the 1907 1st Revision First County Series Survey.

Yorkshire Water boundary data provided by Yorkshire Water. Map based on the 1907 1st Revision First County Series Survey. Contains OS data © Crown copyright and database right (2017).
Pattern of enclosure at Mixenden Reservoir reproduced from the 1934 3rd Revision First County Series Survey.
Appendix 4: Light Detection and Ranging (LiDAR)

1m Resolution LiDAR DTM Slope Model.
1m Resolution LiDAR DTM Slope Model overlain with the location of features recorded as part of the investigation.
Celebrating Our Woodland Heritage Mixenden Reservoir: An Archaeological Woodland Survey

1m Resolution LiDAR DTM Hillshade Model.
1m Resolution LiDAR DTM Hillshade Model overlain with the location of features recorded as part of the investigation.
Appendix 5: Digital Archive

Included with this report is a CD-Rom which contains a digital archive for use by the landowner and regional Historic Environment Record.

The digital archive includes:

- PDF digital copy of this report
- Excel survey database
- Digital photographic archive
- GIS Shapefiles of historic mapping data
Appendix 6: About the Author and Pennine Prospects

At the time of this report’s production, the author Christopher Atkinson was in employment with Pennine Prospects as part of the Celebrating Our Woodland Heritage Project. As Woodland Heritage Officer, Chris was tasked with carrying out a programme of archaeological woodland surveys across the South Pennines. Chris has been in full time employment as an archaeologist since 2006, during which time he has been employed by Herefordshire Council’s archaeology service as Community Archaeologist (2006-2013); Project Officer for the National Trust (2015) and self-employed (2013-2016).

He is experienced in landscape survey, site excavation, geophysical survey, desk-based assessment, use of GIS techniques (including MapInfo Professional; ArcGIS and QGIS) and the production of management plans for clients such as Natural England and Historic England.

He holds an undergraduate degree in Archaeology from the University of Wales Lampeter (2004) and a Masters with distinction in Landscape Archaeology from the University of Sheffield (2015).

Pennine Prospects is a unique rural regeneration company created in 2005 as a champion for the South Pennines, the dramatic upland landscape that stands prominently above the urban centres of Greater Manchester, the Lancashire valleys and West Yorkshire. It is an award-winning partnership organisation that has attracted over £5 million of national and European funding to deliver a wide range of projects aimed at promoting, protecting and enhancing the built, natural and cultural heritage of the South Pennines.

Pennine Prospects lies at the heart of a well-established partnership bringing together six local authorities, two water companies, government agencies and the voluntary sector. The company is strongly committed to sustainable development and enables partner organisations, local residents and businesses to maximise the benefit of the area’s rich natural, cultural and heritage assets.

Through its activities, Pennine Prospects supports the economy of the South Pennines by uncovering, highlighting and promoting all that is special about the area.
In addition, the company develops community projects, promotes access to the uplands and waterways and connects people with their landscape.