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Caerlaverock Castle and Environs: Historic Woodland Assessment Report

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Prepared for	Historic Environment Scotland via CFA Archaeology Ltd (PIC call-off)
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Illus 1 Caerlaverock Castle, with Castle Wood behind (Photo: CM 9902)

1 Introduction

The main aim of this Historic Woodland Assessment (HWA) project is to assess and characterise historic tree and woodland features around Caerlaverock Castle (Illus 1), in the well-defined area known as Castle Wood (Illus 2). The main fieldwork for this project was undertaken on the 13th to 15th of March 2018, by Coralie Mills and Peter Quelch, at the request of Historic Environment Scotland through their PIC call-off contract with CFA Archaeology Ltd. Subsequently we presented our Field Records Report for the Caerlaverock Castle HWA (Mills & Quelch March 2018). Amongst the PICs which have had HWAs undertaken, Caerlaverock is especially rich in historic woodland features. As in all the HWA field record reports, it is important to recognise that our Waymarks and numbered HWA features are *selected examples* of the range of features present, and are by no means comprehensive or exhaustive. The assessment fieldwork is rapid reconnaissance and full Historic Woodland Survey would be required to make a more comprehensive record. This document uses our field records, plus additional strands of relevant evidence, as a basis for this final HWA report.

Illus 2 Caerlaverock Castle and Wood: Circle shows approximate HWA study area (1st edition OS 6")

2 Historic woodland assessment: approach

Our approach to assessing historic woodland is to undertake an informed walkover survey using historic maps and other relevant prior information as a means of identifying key locations to visit. We assess visually and make notes and a photographic record as we undertake the walkover work, and we only record a selection of example features in more detail. Some of these features will be historic trees but we usually also include examples of relevant built features such as woodland enclosure banks. This approach has been developed over a number of prior studies including on South Loch Katrine (Mills et al 2009), at Callendar Park in Falkirk (Mills & Quelch 2012), Falkland Park in Fife (Mills & Quelch 2014) and Balgownie Wood in Fife (Mills & Quelch 2016). In these HWAs for PIC properties we also take account of historic land ownership extent, and focus mainly on land within the same historic ownership as the PIC which was likely to have been managed from or used by the occupants of the castle in the past. In a brief assessment it is not possible to assess every area of wooded land within the historic ownership boundaries, and we acknowledge that there is 'informed subjectivity' in our selective approach.

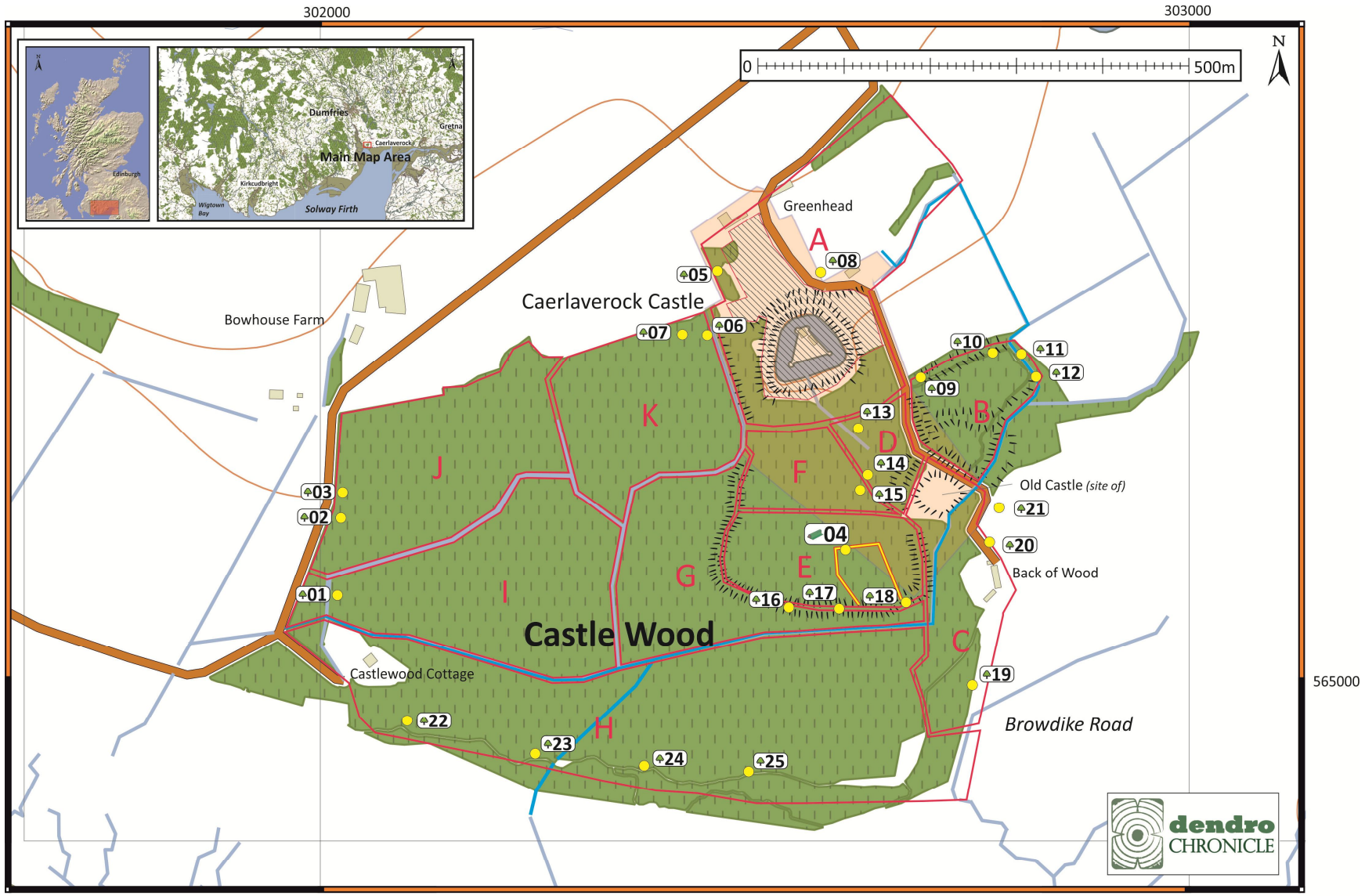
3 Historic woodland assessment: the evidence

3.1 The study area

Situated on the Solway coast south of Dumfries, the spectacular and unique triangular moated red sandstone castle (Illus 1) was built around 1270 for the Maxwell family. The site of a second older castle lies just to the south of the upstanding castle, surrounded by woodland. Overall the woodland at Caerlaverock Castle forms an enclosed rectangular block extending nearly a kilometre from east to west and is known as 'Castle Wood'.

The woodlands at Caerlaverock, though compact and mostly within one large historic enclosure, are nevertheless internally complex, archaeologically, topographically and botanically. Pollen analysis studies have shown that the site has been wooded at least since the first castle was built in medieval times, yet of course that technique of study cannot show the exact location or extent of past woodland. Even a cursory examination of the first edition OS six inch to the mile map surveyed in 1856 shows quite a mosaic of woodland and field within the wider enclosure boundary, that is the large rectangular enclosure first defined on Roy's military survey of 1752-1755, a century before.

Intriguingly the early OS maps, which include a 25 inch to the mile sheet based on the 1856 survey, show a variety of ancient banks and ditches. Fortunately for this study we also have access to a detailed late 18th century estate plan of the study area (details below), and also a recent LIDAR scan, which has proven to be very useful in helping us see the various earthworks under the tree canopy. The Caerlaverock woods contain a host of very large veteran trees, mostly oak of many tree forms. Our main task for this assessment is to make sense of all this geographic information and try to explain the woodland cover and remarkable trees that we see today. We found it useful to sub-divide Castle Wood into a series of compartments for the purposes of considering the development of such a complex wooded landscape, and these are shown in Illus 3 along with our individual example HWA features.



Illus 3: Caerlaverock Castle environs with HWA record

3.2 Review of historic map evidence

Caerlaverock Castle is named on very many early maps, due to its strategic importance and lowland location. Pont's manuscript map of c1590 shows the castle clearly and with woodland to its west. Robert Gordon's map of 1644 is based on Pont's survey and also shows extensive woodlands around 'Bowes' (now Bowhouse), as does Blaeu's Atlas in 1654. However apart from confirming the existence of the woodland in the early modern period, these early maps (and that includes the next two in the sequence, Moll 1745 and Dorret 1750) do not have any survey detail to aid the study.

That situation changes with the Military Survey of 1752-55 by General Roy, which does indeed show the surveyed enclosure around the two castles and an outlier just east of the old castle site with a group of small buildings on it. Roy's map (Illus 4) shows woodland scattered across the whole rectangular enclosure, but with substantial gaps especially in the northern parts.

Illus 4 Roy's Military Survey of c1750 (Source NLS)

Crawford's survey of 1804 is an attractive map (Illus 5), with the wider 'Carlaverock' peninsula shown (many older maps spell the name in this way), and with some detail regarding the castle, its woodlands and enclosures. Interestingly this map includes and names a group of large barns on the coast below the castle. These barns were not shown on earlier maps but are repeated on each of the next series of pre-Ordnance Survey maps by Arrowsmith 1807, Ainslie 1821 and Thomson 1832.

Illus 5 Crawford's survey of 1804 (Source NLS).

The Ordnance Survey's first edition maps are based on a new survey of 1856 (Illus 6), yet do not show the coastal barns at all, so one assumes that by the mid 19th century they have been demolished.

Illus 6 OS 1st Edition 6 inches to the mile, surveyed 1856 (Source NLS)

The OS 1st edition survey does show a small building, the size of a small cottage and garden, at the corner of a wider field below the old harbour (where the 'Browdike Road' meets the old harbour track). This cottage is also shown on the OS second edition map, and so used to be a third cottage at the settlement called Back of Wood (named as on Wells' plan of 1775, see below).

The first edition OS affords an excellent basis on which to imagine the old woodlands during the mid 19th century, but bearing in mind that some features were seen during that survey as redundant antiquities and so are not shown on the map. Also the early OS maps are somewhat confusing in that they show the same style of black lines on boundaries, which can be: walls, wire fences, banks or drains, and only ground-truthing can demonstrate clearly which are which. Prominent hedges are however clearly shown, as can be seen in the map extract above (illus 6), for example in the south east corner of the main rectangular enclosure.

Another complication of this site is that the southern boundary is a constantly changing low lying coast where the merse, or marshland between the southern woodland boundary and the actual shoreline, advances and retreats over a long time scale. Features shown on the first edition OS, such as the southern boundaries of the wood, may now be lost, eroded by tidal action, or perhaps covered by low scrub as in the south-east corner of the main enclosure.

Illus 7 OS one inch to one mile survey 1925 (Source NLS)

It is interesting to note that in the early to mid 20th century the OS surveys, at the small scale of one inch to one mile, demonstrate that the northern third of the old rectangular enclosure is not included in the woodland area coloured green, for both the 1925 (Illus 7) and 1956 OS surveys, this being mainly agricultural land with a few trees. Now the great majority of land within that wider

enclosure is indeed wooded. The map extract above (Illus 7) also clearly shows the main drain running west from the old harbour.

3.3 The 18th century estate plan by James Wells

We were able to consult an estate plan drawn up by James Wells as part of a survey called 'Plans of the Barony of Caerlaverock, 1775 and 1776'. The purpose of these plans was to help the owners and managers carry out improvements to the land, to design new farm units, and so help draw up boundaries and valuations for farm leases.

One of the two plan images that we have seen is an extract of a wider plan of the district, while the other is a page from a book of individual farm plans that shows Castle Wood, Woodback and Greenhead (illus 8). The latter plan gives its scale as 10 chains to an inch (ie 8 inches to a mile), a slightly larger scale than the Ordnance Survey's later standard of 6 inches to a mile. The two copies of the plan show slight differences and it is useful to have both available to look at any particular feature, for example the hedge and outlying woodland along the north boundary, west of the new castle, is shown more clearly on the wider plan, as it is probably part of Bowhouse Farm to the north.

Illus 8 Plan by James Wells 1775, from the book of farm plans

Wells shows the surrounding dyke for the woodland in a very similar shape to General Roy's map. Wells' enclosure includes the circular outlier immediately east of the old castle, though does not actually show the old castle itself, nor the old harbour, as they were by then unused, the structures probably derelict, and the sites reverted to woodland. Wells' plan shows that two buildings have been created at Back of Wood, but no building yet at Castlewood Cottage in the south west corner.

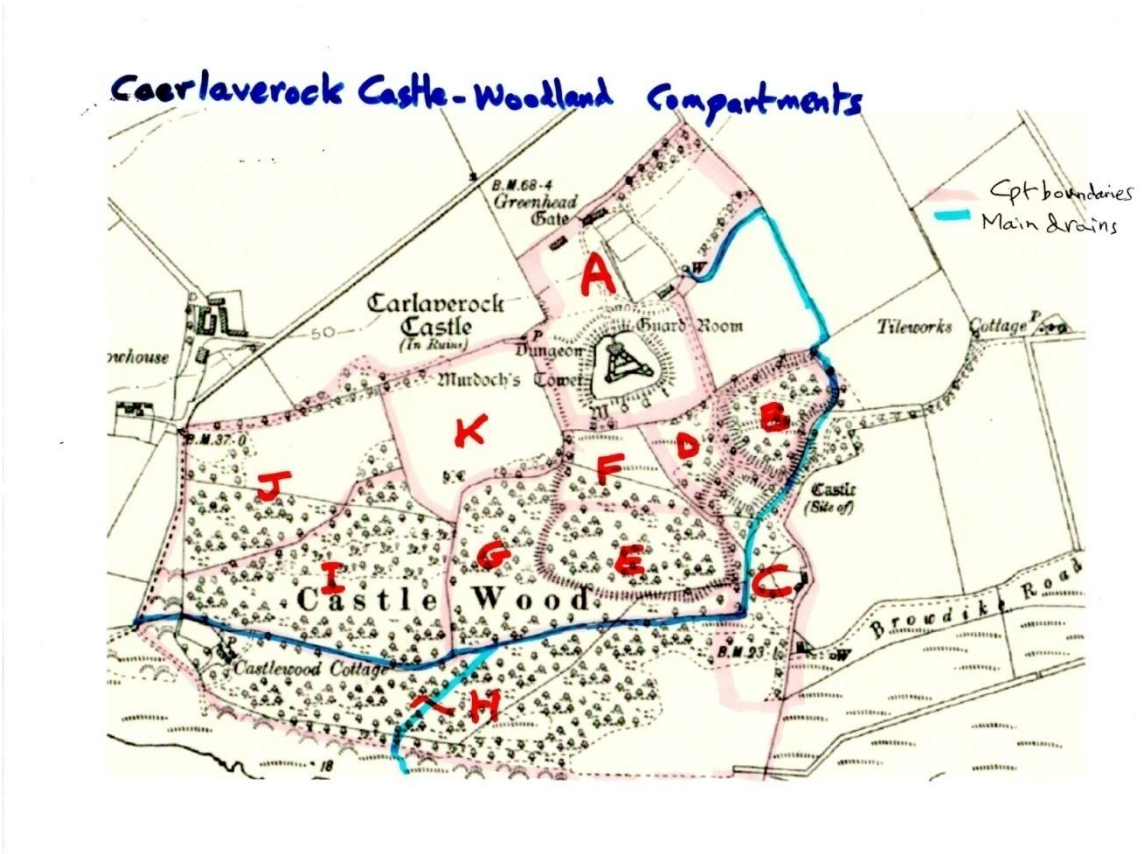
A strength of this plan is that Wells carefully draws in the mosaic of woods and meadows within the main enclosure dyke, with a helpful 'Explanation' or key to symbols appended to the main plan. Unlike the OS maps, Wells has different ways of depicting Dikes, Ditches, Hedges and Open Marches, as well as initial letters for arable Outfield, Croft, Meadow, dry Pasture, Bog, and Woodland. This detail is also shown on the larger estate plan in the context of surrounding fields and farms.

About a third of the area within the rectangular enclosure is shown as Meadow (with red M symbols in the plan above), including most of the northerly field lying immediately west of the new castle. The land immediately north of the castle at Greenhead is shown as 'dry Pasture' (the field lettered 'f' above, has a red P symbol on the wider plan). This nomenclature does hint that much of the Meadow land within the wider enclosure would probably be rather wet, as it certainly is today, but no doubt still very useful for cutting hay and for grazing.

3.4 A review of the main enclosures and the trees growing on them

For descriptive purposes the study area has been divided into a series of wooded compartments A-K with clear boundaries based on boundary banks and internal drains (Illus 3). Most survey effort was directed at the area closest to the castles, and parts of the larger and more recent woodlands in the north and west of the woodlands were not visited except as viewed from their external boundaries. Some features are well mapped on pre-existing mapping and others not at all, and it was extremely useful to have the LIDAR survey for this property which greatly clarified the maze of internal banks and ditches.

Detailed descriptions are to be found in the attached table of compartments (Appendix 1), linking the several hundred photos taken on the HWA survey with particular features and selected veteran trees. A sketch plan showing the compartment (Cpt.) boundaries based on the 2nd Edition OS map is shown in Illus 9. A more general review of the woodlands and highlights of each of the eleven compartments is given below with selected illustrations.



Illus 9 Caerlaverock Castle – Woodland Compartments on 2nd Ed 6" OS map (surveyed 1898)

3.4.1 Compartment A. Greenhead Farm and the New Castle

Lying south of the small farm buildings of Greenhead the first edition OS survey of 1856 shows a rectangular field with a garden occupying its north end beside the house, and a prominent hedgerow on three sides. Today the western bank of this enclosure has huge veteran sycamores, including waymarked woodland feature **CLW008**, growing on it (Illus 10). This early bank connects with the impressive ornamental gateway to the site, which was built in the 1630s at the same time as the Nithsdale Lodging inside the castle. There is a similar massive bank on the west side of Greenhead farm, now lying just west of the visitor car-park, and it too has a huge veteran oak (**CLW005**) and also ash trees.

Illus 10 L: medieval west bank of Greenhead garden with veteran sycamore CLW008 (PQ C8) R: old oaks east of the well, as shown on the 1st ed OS map (PQ C17)

The eastern bank of Greenhead garden also has very large mature oak and ash trees along it, while similar large oaks occupy the knoll north-east of the houses, and at the southern boundary of the field east of the garden. This latter southern boundary is now marked by substantial oaks, and together with the medieval west bank it is shown on the Wells estate plan in 1775 as a hedge (Illus 8).

However the current eastern hedged boundary of the garden is not shown on Wells, but is on the first edition OS, and so was probably planted in the early 19th century. It is interesting to note that Wells does show a small square garden below the house, and another small enclosure to the south where the current estate cottage is. The OS shows a new hedge linking these two minor enclosures into one long garden. Today this area is a grazed field and the only really old trees are at the top section and at the bottom near the gate, with a substantial gap in between. This indicates that the oldest trees here (see Photo PQ C8 at the north end, and PQ C12 or C15 at the south end of the hedgerow) are indeed veteran and must pre-date the Wells plan of 1775. Another feature is that in Photos 12 and 15 the single beech tree is shown to be well to the west of the field boundary, and not part of that 1850s hedgerow as shown on the OS first edition. Perhaps this lone beech is on the southern boundary of that smaller square garden depicted on the Wells plan, though it is nowhere near as large as the oak and ash trees at the top and bottom of that old hedge.

These same banks help form an enclosure around the new castle, while immediately south of the outer castle moat lies one of the older woodland enclosures, that is to say the woodland with some of the oldest remaining trees. There is of course no simple correlation between the antiquity of each enclosure and the age of the majority of trees currently growing in it. Some older trees and especially boundary trees give clues to the relative age of the woodland, and these are what our initial survey looked at most carefully.

3.4.2 Compartment B. Wooded outlier north east of the Old Castle

The track to Back of Wood cottages runs south from the new castle past that castle's rush-filled eastern outer moat. On the walker's left side is an open improved field with a straight bank and ditch boundary. At the southern corner of that field the improvement bank and ditch meets a woodland boundary at right angles. All seems straightforward until one realises that just inside that boundary bank and ditch, which is laid out and planted with oaks in typical late 18th century style, lies a second bank, thus creating a double bank along the north side of this woodland outlier.

There are a few exceptional trees on this older inner bank, in particular a strangely formed oak with swollen burry stem (Illus 11) which we named the 'crinoline oak' as its basal skirt is somewhat more voluminous than usual! Interestingly that tree grows not on top of the inner bank but on its outer edge, thus facing the pre-improvement fields, and therefore seems to be of pre-improvement age.

*Illus 11 'Crinoline oak' **CLW010** on the north facing side of the old bank within the wooded outlier (PQ C28)*

At the north east corner of the wood, the hedge of improvement oaks clearly runs onwards along a field boundary just as shown on the OS first edition survey. The old bank however turns sharply south here, running parallel to a deep ditch which picks up drainage water from fields east of the castles. A few unusually formed oaks survive on this bank, but most of the woodland centre is of quite young growth.

Around the centre of the current woodland a bank and ditch run west towards the track and back to the starting point in the north west corner of the outlier. Thus this ring of banks defines the old enclosure which archaeologists call the Bailey, a defended enclosure outside the castle for domestic and estate buildings, with small fields and stockyards, and probably only a few trees originally. Clearly during improvement times this outlier was extended and converted to woodland, and drainage improved too at that time, but the old internal banks are still visible – as they are in many other parts of Caerlaverock wood.

Roy (Illus 4) shows this small woodland as outside the main rectangular enclosure, and with just a few trees on its northern boundary bank, sheltering a group of houses on the field below. Wells' plan of 1775 (Illus 8) shows this previous wooded outlier expanded and attached to the main woodland. Of course Wells' plan was drawn up at the time of the improvement works themselves. The OS first edition confirms this arrangement, which still holds true. The access track to Back of Wood cottages must run along the top of the old medieval bank containing the old castle's south east moat. A stretch of open water is now trapped on the east side of the track with the woodland lying behind. Meanwhile, the main improved drainage channel runs along the edge of the

expanded woodland and crosses under the track to allow the old castle's moat to drain into it, continuing south into the old harbour itself.

3.4.3 Compartment C. The Old Castle, Old Harbour and Back of Wood

The old castle site was completely wooded on the first edition OS map but is now open and preserved, with a footbridge crossing the moat, though with no buildings standing (Illus 12).

Illus 12 Caerlaverock Old Castle looking N (PQ C52)

The improvement period drain described above collects water from the old castle moat and runs behind the Back of Wood Cottages into the lower part of the old harbour which is otherwise dry (Illus 13). This drain then turns sharply west and runs right through the main woodland area to exit the woodland just north of Castlewood Cottage (see Cpt I).

*Illus 13 L: veteran oak **CLW019** at the SE corner of the woodland (PQ C60)*

R: view into old harbour from the south (PQ C88)

It is hard to imagine this depression in the woodland immediately below the old castle as a functioning harbour with access to the sea, as the site is now well inland, although there have been many changes in the coastal merse since the middle ages. Historical evidence confirms that this harbour had a very important role, not just as access to the castles at Caerlaverock but as a main entry point to Scotland for trading ships crossing from Cumbria and beyond.

Features which stand out around the harbour are a very prominent western boundary bank (now heavily colonised by badgers), an entrance track from the old castle above, and a circular mound in the centre of the floor of the harbour. The lower part of the harbour is open to the south, and perhaps used to have a tidal barrier of some sort here?

3.4.4 Compartment D. Boardwalk woodland, north of the Old Castle

There is a slatted wooden boardwalk running from the gap in the centre of the south moat bank of the New Castle, south to a small footbridge and then by the main footbridge over the moat to the Old Castle. The early part of the boardwalk runs over the fan of debris excavated out of the new castle and moat which is still more or less un-wooded. The boardwalk allows visitors to cross a swampy wet woodland between the two moats (Illus 14), which if always this wet (it now includes areas of standing water), would have been an additional defensive barrier to the new castle.

*Illus 14 L: large alder **CLW015** in the centre of the boardwalk woodland (PQ C221) R: the drain out of the boardwalk woodland meets the drain from the NW moat of the old castle (PQ C244)*

The boardwalk allows easy access to view the complex pattern of drains, moats and old banks in the area between the two castles, and it passes through some very old woodland. There are many old alder stools close to the drain as well as big oaks of a variety of tree forms, mainly but not only on top of the banks, as on many other old banks at Caerlaverock woodland.

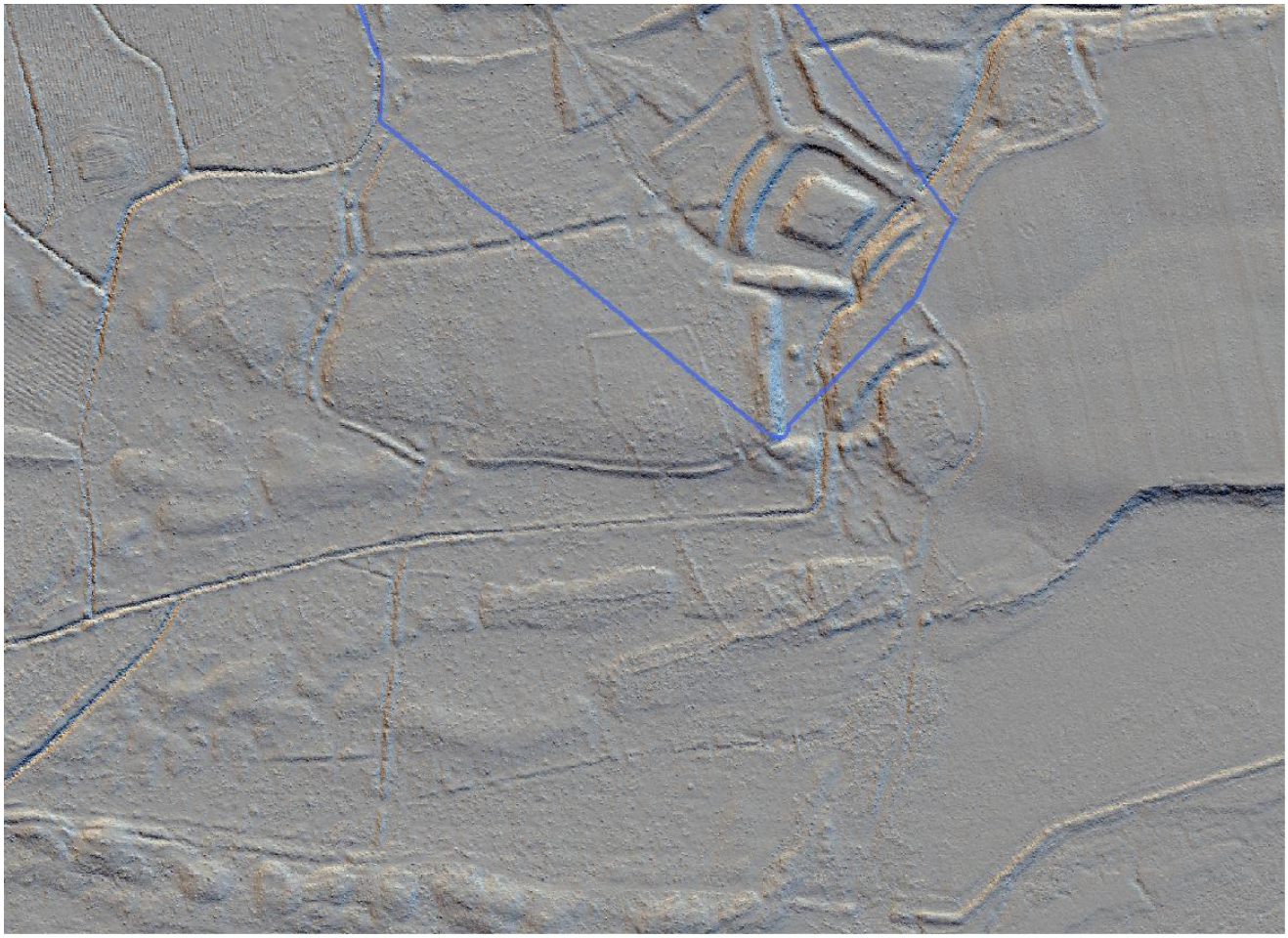
3.4.5 Compartment E. Woodland west of the Old Harbour and north of the 'Curved Dyke'

While visiting the lower end of the old harbour we discovered the remarkable curving bank (Illus 15) which runs west from a gap in the western wall of the harbour. In later visits we were able to walk along this important internal boundary feature, and a full itinerary of the trees and woodland areas seen from this bank are described in Appendix 1. The bank itself is unusual in that close to the harbour it has no real drainage ditch alongside and seems to be more of a protective bank for what may have been old fields above it to its north. The LIDAR image (Illus 17) backs up this idea and in particular an old rectangular field is visible and can be traced on the ground (Illus 16), which is now occupied by a relatively young beech plantation, but with older oak stumps through it. However, the temporal relationship between the curving southern dyke of Cpt. E and the old field within it is not clear, and in the LiDAR image (Illus 17) there are further traces of feint linear banks

extending south of the curved dyke, apparently connecting with the west edge of that old field. The older woodland cover in Cpt. E respects the curved dyke edge but not the internal field boundary, presumably because the curved dyke is a more functional feature which performs the purpose of separating the higher, better drained interior of Cpt. E from the lower wetland to its south. It is unlikely to be a deer park boundary, as the markedly lower land surface level to the south of the enclosing dyke would serve to keep animals out, not in. One possible original purpose of the curved dyke could have been as a sea wall, protecting the enclosed land around the castle when the shoreline was further north than it is today. The possibility of deliberate land reclamation should be considered, and could explain why Cpt. E is relatively well drained. It does seem very likely to be a medieval feature constructed for one or other of the two castles. The possibility therefore exists that the feint field system is earlier than Cpt.E and one or both of the castles. Archaeological investigation would be required to tease out the sequence and function of this enclosure further, including examining its relationship to the old harbour.

*Illus 15 The 'curved dyke' at the point where an access to old field systems crosses it, close to the harbour. Oak stump **CLW018**, in centre middle ground. This location is something of a landmark in the complexity of Caerlaverock Wood and we named it 'The Gateway' (PQ C91)*

Illus 16 Part of the old field boundary is actually within this image, stretching away from the LH corner, but it is much easier to see the slight earthwork on site than in a photo (PQ C272)



Illus 17 This LIDAR image extracted from 'Caerlaverock ALS Low' (HES data) shows the rectangular field south west of the Old Castle and north of the curved dyke, and perhaps south of it too. The 'gateway' to the enclosure that the curved dyke is the south boundary of, is visible immediately below the south apex of the blue polygon which defines the PIC area, and which is also at the south tip of the large west bank of the Old Harbour. The right angled bend to the west in the main drain is also very visible in this image, immediately south of the Old Harbour entrance. So is the circular mound in the centre of the harbour floor.

Illus 18 View from the west bank of Cpt. E into the level and well drained western part of the woodland (PQ C336)

Illus 19 The west bank of Cpt. E, just north of the south west corner, looking south, with the bank having a ditch on both sides (PQ 342)

Illus 20 There are several cross drains like this one, on the west bank of Cpt E (PQ C346)

Illus 21 In the south west corner of Cpt. E the bank at times becomes an island with wet areas to north and south (PQ C353)

Illus 22 Bank and ditch just east of the south west corner of Cpt. E, heading east onto drier land (PQ C355)

Illus 23 Large oak stool on the wide south bank of Cpt. E (the 'curved dyke') (PQ C357)

Illus 24 Looking back west to the south west corner of Cpt. E, where the curved dyke now does indeed curve strongly to the north (PQ C360)

3.4.6 Compartment F. Old woodland south west of the New Castle

This area is separated from Cpt. E below it by a long straight bank and ditch, which while it is very obvious on the Lidar image above, is not shown on any of the old maps. That bank and ditch crosses from its junction with the curved dyke all the way east to the main drain beside a prominent alder (seen at photo PQ C221, Cpt. D). The Lidar image (Illus 17) shows the ditch continuing east to join with the old castle north west moat.

So we are defining Cpt. F as the woodland north of this 'Lidar bank', west of the boardwalk, and south of the bank which defines the southern moat of the new castle. Although the area is in places very wet it does have some very remarkable old trees within it, some of the most impressive on the whole property. Although there are few big trees on the Lidar bank itself, causing it to seem more akin to a later internal improvement ditch than an early bank, there are some remarkable trees north of it.

Illus 25 The 'Lidar bank' is on the RHS of the shallow ditch stretching away west from the viewer (PQ C284)

*Illus 26 This is the prominent alder **CLW015** situated beside the junction of the main drain and the Lidar bank (PQ C285, also = C221)*

Illus 27 An unusual oak pollard is situated just north of the 'Lidar bank' (PQ C290)

Illus 28 Just north of the pollard oak is a group of coppice oak stems on a dry island, perhaps a single old stool? (PQ C291)

Illus 29 The 'Lidar bank' nears its western end – it has many oak stumps along it, and it is clearly a raised bank here (PQ C296)

Illus 30 The Lidar bank then meets with the larger north-south 'curved bank' (described in Cpt. E) (PQ C298)

Illus 31 On the west side of Cpt. F the north part of the 'curved bank' has a double ditch and in places a double bank too (PQ C301, 303)

Illus 32 Near the north end of the curved bank (but not on the bank) is a massive oak stool within mixed wet woods (PQ C316, 306)

Illus 33 Close up view of this remarkable oak stool, close to the New Castle south moat (PQ C329)

Illus 34 The 'curved dyke' seems to end just south of the New Castle moat at this group of oak stools and hollies (PQ C314)

Illus 35 Two large oaks at the north west corner of Cpt. F, with the New Castle visible in the background across its south moat (PQ C309)

3.4.7 Compartment G. Central woodland west of curved dyke

This area is not such a distinctive woodland, contains a high proportion of young woods and plantations, but often with oak stumps still visible from older crops.

Illus 36 Typical young crops amidst old oak stumps within Cpt. G (PQ C332)

3.4.8 Compartment H. South Wood

For convenience all the woodland south of the main drain (which runs west from the old harbour) has been labelled Cpt. H. At the far east end of the compartment we already noted some big old oaks at Back of Wood in Cpt. C (eg CLW019 in Illus 13, Photos PQ C60,61,62). The rest of the South Wood is described below starting at the public car-park at its west end, more or less following the trail eastwards, past the footbridge, to a point where the woodland becomes almost impenetrable with scrub, fallen trees and wetlands.

The Lidar image clearly shows the original boundary bank as cutting diagonally across what is now the garden land of Castlewood Cottage, and some of that old dyke is still visible emerging at the east end of the garden (Illus 37). The bank and ditch continues eastwards, sometimes becoming a double bank.

Illus 37 The oak stool in the foreground is on the line of the old boundary bank which crosses Castlewood Cottage garden (PQ C74)

Illus 38 North of the southern boundary bank are extensive areas of wet woodland of high biodiversity value (PQ C370)

Illus 39 Trail here crosses to the south side of the southern boundary bank with old oaks along most of it (PQ C378)

*Illus 40 At one point is a large fallen pollard oak **CLW024** on the southern boundary bank, while most oaks here are multi-stem stools (PQ C386)*

Illus 41 On the southern boundary bank near the trail is a large oak stool, and running north from it is an old field bank (PQ C393)

Illus 42 Old field bank (visible on LIDAR image) runs north from this oak but quickly becomes impassable in wetlands (PQ C394, 395)

3.4.9 Compartment I. Bowhouse Wood (West)

This central compartment covers a large area of woodland, but on our visit we only covered the western boundary. This is part of the bank and ditch defining the Roy period (c1750) western edge of the rectangular woodland enclosure which runs north from Castlewood Cottage to Bowhouse (Illus 4). Despite this antiquity of more than 250 years it is surprising how few changes have been made to this layout on the ground. For example the place where the main drain exits the woodland and crosses under the road is unchanged, and from that culvert the drain runs in a straight line fringed on the north west side by alders to another field improvement drain (marked 1779 on Wells' plan, Illus 8) and thence to the sea (photo below).

Another example of small changes is that the strip of land between the old western bank and the public road is filled with secondary woodland and the actual old bank and ditch is easily recognised. That bank, wide at its south end near the cottage, has some very large oak stools

growing on it. The northern part of this compartment is defined by a prominent other bank and ditch running north east to dissect the north western part of the woodland.

Illus 43 L: line of alders below the drain culvert (PQ C98) R: main drain runs west along the cottage garden edge (PQ C103)

Illus 44 L: looking north along the west bank, with secondary woodland on LHS. R: internal ditch running north east (PQ C105, 113)

*Illus 45 Veteran oaks (**CLW001** in foreground) along the wide western bank in Cpt. I (PQ C110).*

3.4.10 Compartment J. North-west woodland

North of the cross-drain the old western woodbank supports some amazing veteran oaks, with high quality wet woodland habitat immediately east of the bank. An estimated ring count of 160-200 rings was obtained from a fallen branch of oak **CLW002**, and a stem age of c. 180-200 years was obtained from one of the large multi-stem oaks on the outer bank at the east end of the north edge of Cpt. J, perhaps suggesting a last coppicing episode in the early 19th century, though more targeted sampling and thorough tree-ring analysis would be needed across the wood to establish dates of coppicing episodes and ages of trees more reliably.

*Illus 46 Old oak stools on the bank, with **CLW002** in left shot (PQ C120, 121)*

*Illus 47 More oak stools as we head north, including **CLW003** in R shot (PQ C124, 126)*

*Illus 48 Close up of the internal wide diameter of the last stool **CLW003** (C126) – (PQ C127)*

Illus 49 After the bank turns east at Bowhouse, the old bank seems to run inside the wood, while the field edge has some very large oaks along it (PQ C171)

Illus 50 Internal view of the spinney which lies unfenced within the field, looking west to Bowhouse farm (PQ C163)

Illus 51 This open grown oak with basal skirt lies inside the woodland fence but must have been previously part of the grazed oak woodland inside the field and outside the old bank (PQ C169)

3.4.11 Compartment K. North-east woodland

The Northern boundary bank continues to run east towards the New Castle with many veteran oaks along the bank and the field edge. The first edition OS map (Illus 6) is meaningful here as it shows a detached narrow strip of woodland, including the spinney which is now outside the bank. There are also many other veteran oaks just outside the bank, previously part of this early shelterbelt which is also shown on Wells' 1775 Bowhouse plan (Illus 8). These large oaks outside the bank contrast in location with those actually on the bank at its eastern end.

Illus 52 L: large oak outside the bank, beside the central gateway (PQ C158) R: oaks east of the gate also outside the bank (PQ C156)

Illus 53 L: recording a large oak pollard outside the bank (PQ C154) R: massive multi-stem oak also outside the bank (PQ C149)

*Illus 54 Two views of a large multi-stem oak **CLW007** right on the bank, east of the above oaks (PQ C147 and C142)*


Illus 55 L: View across the ditch on the south east boundary of Cpt. K into plantation on flat land which was mainly field on the 1st Ed OS (Illus 6, PQ C318). R: large alder stool in the same area – note that the 1st Ed OS does show a small woodland area along this boundary and this alder must be left from that woodland patch (PQ C328)

*Illus 56 Large multi-stem oak **CLW006** on the bank at the north east corner of Cpt K (PQ C140)*

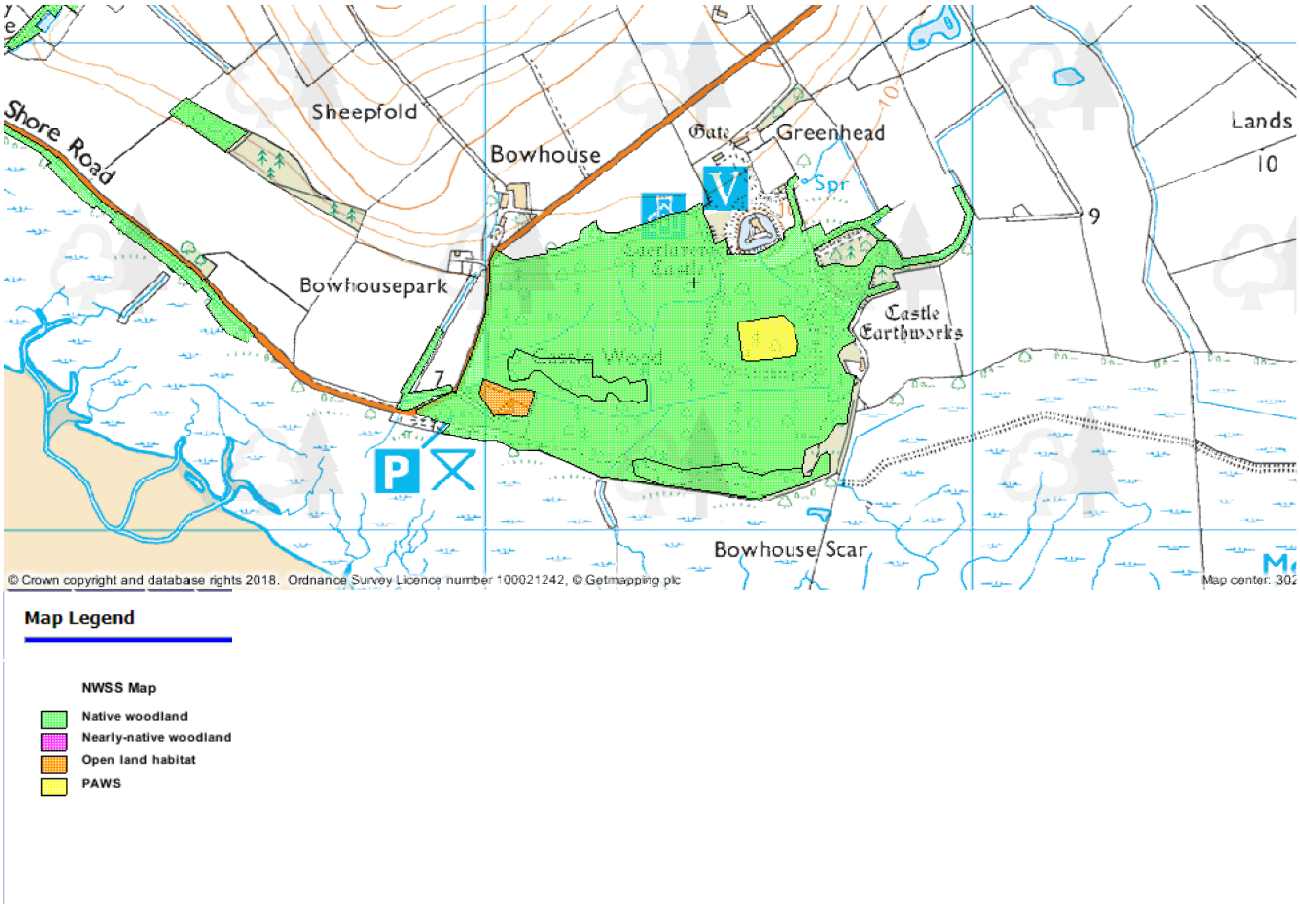
Illus 57 Immediately east of the oak multi-stem is a large Sitka spruce, with the New Castle visible behind it. Here the ditch can be seen to be strongly curving round to the south, running parallel to the west moat of the New Castle (PQ C136)

3.5 Other sources of field evidence

Other relevant recent survey results were consulted to augment our own HWA field observations for the environs of Caerlaverock Castle. Of particular relevance is the Native Woodland Survey of Scotland which was completed in 2013 and which is available on the Forestry Commission website. The Woodland Trust's Ancient Tree Inventory is also a relevant, if less comprehensive, resource; it holds records of examples of Ancient, Veteran and other Notable trees, recorded by volunteers.

3.5.1 Native Woodland Survey of Scotland (NWSS)

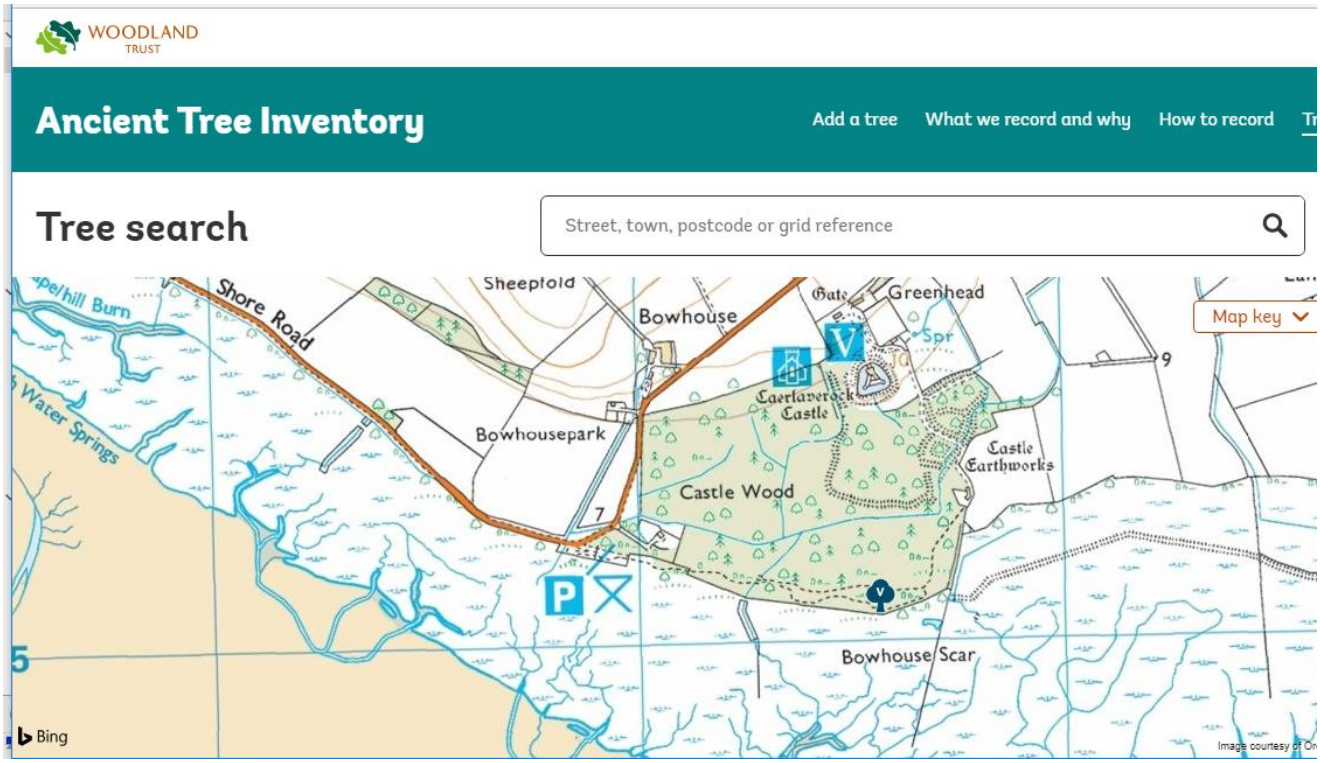
The NWSS results for the study area were examined online (Illus 58). The NWSS identifies most of the study area as native woodland (bright green). The only exceptions are the (orange) open area around Castlewood Cottage at the south west corner of the wood (in our Cpt. H), and the small area of young beech plantation classed as PAWS (yellow, Plantation on Ancient Woodland Site, in our Cpt E). Of course, 'native-ness' is not the same as 'natural-ness', and while Castle Wood is dominated by native species it is clearly much shaped by human intervention in the past.



Illus 58 Caerlaverock, Castle Wood extract from the Native Woodland Survey of Scotland

3.5.2 Ancient Tree Inventory (ATI)

The Woodland Trust's ATI is continually acquiring new records as volunteers continue to record more trees, distinguishing between 'Ancient' trees in their last stage of life, 'Veteran' trees which have some ancient characteristics but are not regarded as so old, and 'Notable' trees which may be special because of size or some other attribute or association. However, there is surprisingly only one ATI record within our study area (Illus 59), a veteran alder recorded on the southern edge of Castle Wood. Therefore no trees within the PIC are recorded in the ATI, although many of them would be eligible candidates. There are also candidates within the wider study area, again not so far recorded in the ATI. The selected trees we recorded as tree features for this assessment survey would be worthy of addition to the ATI records as a first step towards a more comprehensive record.

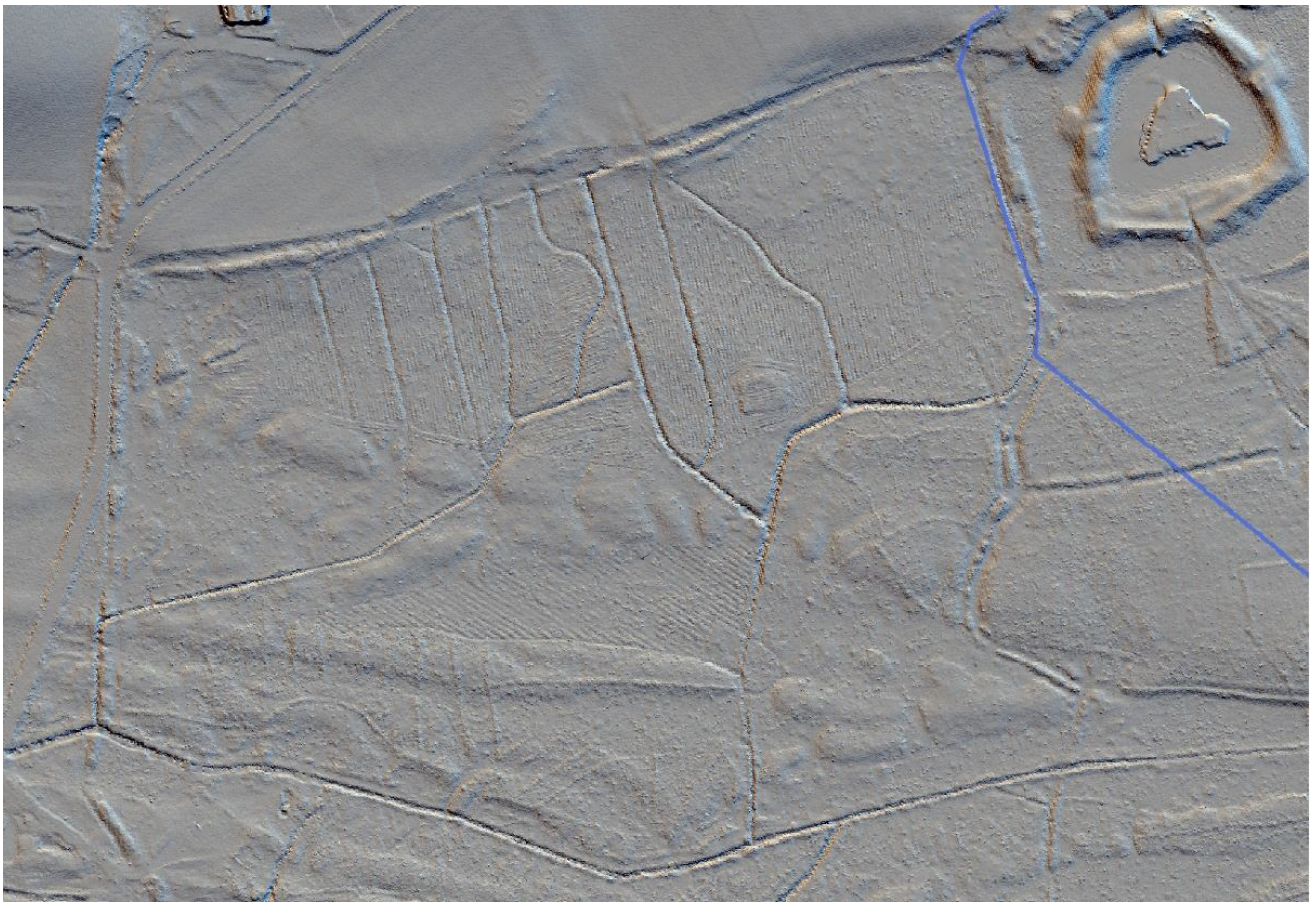


Illus 59 Ancient Tree Inventory records for the study area (accessed July 2018). The tree symbol on the southern edge of the wood, marked V, is the only record (of a veteran alder) in Castle Wood. Many more trees would qualify.

4 Discussion

We have unusually good map evidence for Caerlaverock woodlands including a clear outline of the main enclosure on Roy's military survey c.1750, a detailed estate plan of 1775 by Wells and the usual high quality series of Ordnance Survey maps from the mid 19th century onwards. The map evidence shows the study site as largely well-wooded since at least the mid 18th century, although with notable open areas, and in general an increase in woodland cover over that period. The NWSS classes Castle Wood as largely native woodland, but the various strands of evidence we have considered point to it being far from natural. The woodland is a mosaic of old oaks, many of them formerly coppiced (see Appendix 2 for glossary of tree forms) , and mainly sited on the drier areas including the many earthen banks in Castle Wood, inter-mixed with wetter areas of alder-rich carr woodland between the upstanding drier areas.

Access to a new set of evidence, a LiDAR survey which depicts earthworks underneath the leaf canopy, showing man-made and natural features on the ground surface as if there were no vegetation masking them, reveals a complex suite of archaeological features beneath the woodland canopy. Some surprising discoveries are made through the LiDAR evidence, causing us to name features such as the 'Lidar bank' after this new technique, since that feature is depicted on LiDAR images yet is not shown on any maps, despite being very visible on the ground.



Illus 60 Lidar image of the NW part of Caerlaverock woods (extracted from HES data: Caer 1.pdf)

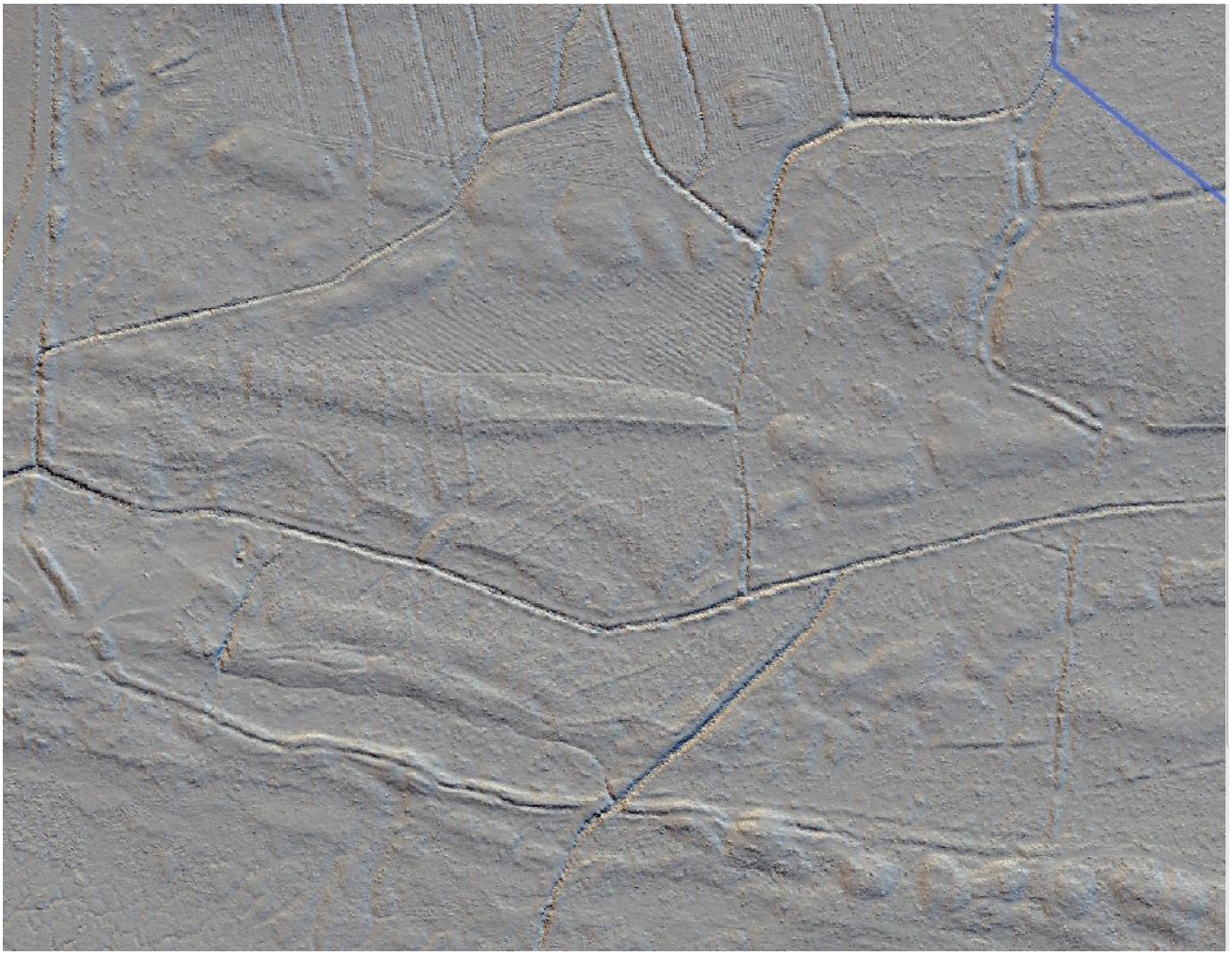
There can be problems of interpretation with LiDAR, since modern surface features such as drains or forestry cultivation for example are also shown. It would take a much closer look on the ground to gain experience in which features are old features, and we are still at a learning stage with LiDAR. For example we might believe that the regular drainage pattern in Cpts J and K shown on the LiDAR image

(Illus 60) are perhaps medieval strip fields, when in fact they must be very recent forestry cultivations. There is also a smaller scale striped effect visible in that area, mostly parallel with the drains, and one assumes that is forestry cultivation carried out before planting in lines.

By contrast the triangular area in the centre of Cpt. I has regular diagonal stripes, further apart than those in the plantation north of it, and it is not clear without a further field visit what this pattern of marks represents. It is fascinating to compare the above image to the 1st Edition OS map (Illus 6), which shows that this triangular area is in fact a field in 1856 (numbered 680 on the 25 inch OS 1st Edition survey), and is also shown as a field on Wells 1775 (Illus 8). By the second edition OS 25 inch survey this triangle is shown as scrub and is no longer a numbered field. However it is not possible to tell without looking on the ground if the diagonal cultivation is old rig and furrow or modern forestry cultivation. It does not look the same as the regular finer stripes in the areas to its north, which we know are young plantings also on previous open fields.

There is a fairly obvious distinction between raised banks and sunken ditches on the LiDAR images. Of interest therefore are the patterns in compartments I and H illustrated below (illus 61), lying to the south of the triangular old field, down to and also below the main east-west drain. This major drainage route is not shown on Wells' plan of 1775 (Illus 8) but is mapped on the 1st Edition OS in 1856 (Illus 6), so it was probably built in the early 19th century.

This pattern of small raised banks looks like old small field patterns, yet on the maps of Roy, Wells and the OS this has been woodland throughout. It looks as if this area may perhaps be a medieval field system; either that, or early forestry cultivations by hand created when the main woodlands were planted before Roy. There appear to be very similar patterns on this image as in other areas such as Cpt. G just to the east. Also it is a similar pattern to that in the south east corner of the large enclosure Cpt. E, including the old field just west of the Old Harbour which we identified on the ground (see LiDAR, Illus 17). In general, the shoreline appears to have been accreting and moving southwards in historic times, and there exists the possibility that some of the better drained, raised areas within the wood were originally closer to the shoreline and reclaimed from the Merse quite possibly in medieval times.



Illus 61 Lidar image of the SW part of Caerlaverock woods (extracted from HES data: Caer 1.pdf)

In some ways these findings are possibly more significant than the more obvious woodland history over the last 250 years (since Roy), as they hint at an earlier pattern, perhaps medieval, of small fields intimately mixed with small woodlands. Many of these early small woodlands are still visible on the ground, indeed have very large oak trees still growing on them.

Many of the largest oak stools are found today close to the external boundary banks, mostly as multi-stem stools which means that they used to be regularly cut and coppiced. There are also a number of old oak pollards and some skirted single stem (maiden) forms, both suggestive of a grazing element to past land use. Where there are two parallel banks, as there are on many of the outer boundaries of Castle Wood, the larger, more veteran looking oaks, tend to be on the larger, inner bank which is probably medieval, and the new smaller, straighter improvement era banks and ditches have often been created just outside the probable medieval footprint. It is possible, though hard to prove, that Caerlaverock wood might retain early examples of very wide wooded banks and ditches with active coppicing and pollarding along them (see Appendix 2 Glossary of tree forms), yet allowing much of the land enclosed to be used for agriculture. Author PQ has seen examples of this land-use pattern in Holland, in a landscape of fertile yet wet soils where extensive woodlands were not created during improvement times (see Nederland weer mooi, landscape restoration project, at this website http://www.nederlandscultuurlandschap.nl/).

Our working hypothesis is that small patches of early woodland survive at Caerlaverock within a much wider patchwork of improvement period oak plantings (mostly subsequently coppiced), interspersed

with semi-natural wet woodlands and modern plantations. Examples of the likely oldest trees include the big oaks scattered along the west and north boundaries and the spinney in the north field, and at least some of these trees are likely to have been present when Roy's survey was made in the mid 18th century. On the opposite side of the rectangular enclosure, just south of Back of Wood, is another small patch with old oaks, and all these areas are close to the main boundary banks. Another main concentration of old trees lies within our compartments D and F, south of the New Castle and north of the 'Lidar' bank.

It is difficult however to tell just how old the earliest trees at Caerlaverock may be from visual characteristics alone, further complicated by the fact that many of them have been coppiced, and thus their stem ages will be younger than the organism ages. In the couple of random cases at Caerlaverock where clear cross-sections of oak were exposed, we found stem ages in the order of up to 200 years, which indicates Improvement Era woodland management. It is more likely that we will find evidence of much older trees in the rarer maiden forms at Caerlaverock, especially some of the large pollards and skirted oaks, and as explained above, some of these older trees may have survived from wooded strips interwoven with old field systems and other open functional areas around the castles. Elsewhere in Scotland, firm field evidence for medieval coppicing is scant though we know from the archaeological evidence for the wattle walls of the common creel houses that it must have occurred (Stewart 2003, 93). Coupar Angus Abbey's woodland management in the Campsies is often quoted as the medieval coppicing example in Scotland, yet their coppice enclosures suffered from grazing damage and the wood did not survive in the longer term (Crone & Watson 2003, 71), a fate which was shared with many other woods of that period in Scotland. In contrast, at Dalkeith Park, there are large multi-stemmed oaks with mid to late 16th century stem origin dates (Mills 2015), in other words they are the result of coppicing in the 16th century which, in this park setting, were not coppiced again thereafter, but we have no evidence thus far of a formal park at Caerlaverock. At Balgownie Wood in Fife there was strong documentary evidence for a working oak coppice being established in the 16th century over former Culross Abbey-owned rig farm land, though very little surviving field evidence for that stage of the tree cover (Mills & Quelch 2016). At Balgownie and elsewhere, it is the Improvement Era oak coppices which have left far more tangible evidence including numerous old overgrown coppice woods with origins in the 18th and 19th centuries, when they were exploited principally for charcoal making and tanbark (Smout et al 2005, Chapter 9). In large part the tree cover at Castle Wood probably falls into this category, albeit protecting much earlier built features beneath. The extensive Montrose coppice system to the east of Loch Lomond was the largest such oak coppice system in Scotland at this time, and a part of this system at South Loch Katrine has been studied in some detail in terms of tree forms and precise dendrochronological ageing of trees and related management events (Mills et al 2009), a model which could be applied to unravel the tree cover history at Caerlaverock further.

Work on dendrochronological ageing of trees, especially of oaks, of various forms and locations, on ground truthing of the Lidar images against what can be seen on the ground today, and on targeted archaeological work would help progress these ideas further. Recommendations for future investigations are outlined below.

5 Recommendations

In terms of understanding the history of the tree cover of the study area further, obtaining a closer handle on the age of a range of tree features would allow a dated sequence of woodland management and landscape development around the castles to be identified. This could be done with some targeted dendrochronological work on a mix of disk samples from recently fallen trees and some coring of selected living trees. This could also assist in understanding the complex sequence of earthworks

and enclosures in the wood; the built heritage and the woodland history are closely entwined in this historic place.

Castle Wood also merits some archaeological investigation, initially through checking the LiDAR survey with ground truthing, perhaps followed up by targeted small evaluation trenches through banks and other built features, especially those of potential medieval date. This could address the question of how long Castle Wood has been a wood, and what the land was used for beforehand, as well as identifying the nature of any ancillary structures to the castles. It could also inform an understanding of how the shoreline has shifted, how relict shore features have influenced landscape development, and whether any land reclamation from the Merse was undertaken.

Obtaining some chronological control on those features would be important. This could be done by a combination of archaeological and dendrochronological investigation. Corresponding documentary research in the archives regarding this wider landscape history would also be very useful.

A good number of the trees in the PIC area, and in Castle Wood more widely, merit being recorded in the Ancient Tree Inventory; currently there are no ATI records from the PIC area and only one from Castle Wood. Some of the trees present in what we have identified as the earliest surviving stands would qualify as truly ancient, and besides them there are many more candidates for recording as veteran or notable trees. The large trees on the forecourt banks to the north of the 'New Castle' are probably amongst the oldest specimens, and likely to be quite early planted features. Further research into the history of Sycamore in Scotland would also be useful in this respect.

6 Acknowledgements

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8 Map sources, in chronological order (mostly consulted on NLS online map collection)

Pont 35, pub c1583-96

Robert Gordon pub 1644

Joan Blaeu pub 1654

Herman Moll pub 1745

James Dorret pub 1750

William Roy, surveyed 1752-55

James Wells 1775 Plans of the Barony of Caerlaverock, 1775 and 1776

William Crawford, pub 1804: (2 views)

Aaron Arrowsmith, pub 1807

John Ainslie pub 1821

John Thomson pub 1832

OS First Ed 6 inch surv 1856, pub 1861, sheet LXI

OS First Ed 25 inch, surv 1856 pub 1861, sheet LXI.9 (3 views)

OS 2nd Ed 6 inch surv 1898 pub 1900 sheet LXI.SW

OS 2nd Ed 25inch surv 1898 pub 1899 sheet LXI.9 (4 views)

OS One inch sheet 88 Dumfries 1925

OS One inch sheet 74 Dumfries 1956

APPENDIX 1 Caerlaverock Castle and its wooded landscape

List of the main enclosures and selected photos of key features,

Cross-referenced with **waymarked features** in field record report (Mills & Quelch, March 2018)

Abbreviations:

Points of compass= NE etc

Cpt = woodland compartment A-K, delineated for the sole purposes of this study

Impr = Improvement period bank and ditch, 18th C and early 19th C

m/s = multistem tree, eg coppice stool

Cpt A. Greenhead Farm and the New Castle

FEATURE	SELECTED TREES	SELECTED PHOTOS (PQ)
Medieval W bank of Greenhead garden	2 huge sycamores including **CLW008** at S end of bank	6
E bank of Greenhead garden	Mature oak and ash	8,12
Oakwood NE of houses	-	14
Southern boundary, starting at the well	Mature oaks	13,17
West bank of Greenhead farm	Huge multi-stem oak **(CLW005),** and ashes	68, 69, 134
Bank defining outer moat, south of new castle	Big oaks along this bank, both multi-stem and pollard (including **CLW013**)	200, 201, 205

Cpt B. Wooded Outlier NE of Old Castle (incl The Bailey)

Improvement style bank runs south from Greenhead cottage	Single mature oak at S corner.	21
Corner of Impr bank running NE, forms in effect a double bank (26)	The big multi-stem oak (**CLW009**) is at the start of a double bank	22, 26
Outer impr bank on N side of the outlier	Hedge of mature oaks	33
Inner medieval bank on N side of outlier	'Crinoline oak' (**CLW010**) on outer edge (27, 28)	23, 24, 27, 28
Hedge of oaks continues to run NE past outlier	Line of old oaks	35
Medieval bank turns to SE	Big rotted stump 36 (**CLW011**), fused m/s oak 40 **(CLW012),** scrogg pollard oak 41	36, 40, 41
Deep drain on outside of the bailey collects underground drainage water from fields adjacent		38
Internal bank and ditch, divides the outlier woodland into two	Hardly any old trees in woodland centre	45
Western bank of bailey	Big old oaks along this bank	44,47

Cpt C. Old Castle, Old Harbour and Back of Wood

Old castle site, with footbridge entrance		52
End of NW bank of castle moat meets improvement drain at W corner		51
Drain crosses road at NE corner of castle moat		54
Bank along S side of moat		57
Bank and hedge on trackside just N of Back of Wood cottages	Big m/s oak stools, including **CLW020**, on this bank show its antiquity. Also large single stem oak stump **CLW021** further E on this bank	59
Remnant of old woodland where the track meets the old harbour entrance, also where Browdike road meets the track	Old fused m/s oak (60) is a remarkable veteran tree on the old boundary dyke, recorded as **CLW019**. Another old tree (62) lies inside the wooded remnant, beside trail path	61,60, 62
The main drain exits the harbour and turns sharply west		84,86
Main drain heading west		87
Floor of the harbour, from S end		88
Massive west bank of the harbour		89
West side of W bank has many signs of a large badger sett within the bank		258,259
Views of the harbour from the N end	W bank on RHS of photo 252, and main drain on E side (LHS). Central circular mound visible behind tall leaning alder with violet lichen colouring (250)	249,250,252
Circular mound in the harbour centre	Holly growing just SE of mound (256,257)	250,251,253, 256,257
View back N to old castle south side		254

Cpt D. Boardwalk woodland, N of Old Castle

Start of boardwalk from new castle south moat bank		207
Start of short bank and ditch (runs NE to link to inner bank and ditch of bailey)	Prominent oak with white lichenous bark on this bank end (**CLW014**)	208, 214, 280,281,282
Wet area beside the boardwalk has remains of very old trees:	Rotted remains of a big alder stool with a huge old oak stool behind (seen more closely later and described in Cpt F)	211

A main drain begins at this wet woodland (216), running slowly down to join the S moat of the old castle	Big old alder stools along this drain edge (alder in photo 221 is a landmark, **CLW015**)	216, 220. 209,221, 222 283
Boardwalk crosses drain by footbridge onto outer most bank of old castle on NW side		228
NW bank and ditch of old castle moat heads towards the track	Broken oak in recent gales forms a landmark tree in this complex area (238)	229, 233. 238
Main drain meets the drain from the NW moat of the old castle and joins the S moat		241, 242, 243, 244
Substantial bank between S moat and harbour		245, 246
A track leads down to the top of the harbour	More photos of harbour and its trees in Cpt C above	247,248, 249

Cpt E. Woodland W of Harbour, and N of 'Curved Dyke'

At SW corner of the harbour a track emerges		260
This track seems to access the dry N side of the long curving dyke which stretches away to the west, curving gently N	Coppice stools along the bank, though few big trees. Occasional oak coppice stool stumps on curving dyke including **CLW017**.	262, 90, 91,92,93
Near the E end of the curved dyke another track crosses it, which seems to be the entry to the SE corner of an old field immediately N, ie (a 'gateway')	Note there are no trees growing on that old track, which also has raised side banks. There is a weathered oak stump **CLW018** on the W side of the gateway, just N of the curved dyke	91
That old field is very flat and well drained with no stones, obstructions or visible drains (**CLW004** is at NE corner of field)	The old field is now bearing a crop of youngish beech with small oak stumps	94, 263
Just above the curved dyke and not far W of the cross track 'gateway' the field boundary visible on LIDAR but not on any old maps starts heading NW	The point at which the field boundary (a low earth dyke) begins, is marked by a grassy green badger sett.	264,266,267
The old field boundary soon turns due N at another faint earthwork with signs of badgers	Small oak stools frequent along this old field boundary	268,269
The W boundary of the old field is more obvious on the ground than in photos	The beech planting seems to respect the old field boundary	272
The boundary turns at right angles E and meets the west bank of the harbour	An oak coppice stool is on the old bank at the field's NE corner	273
The E boundary of the old field runs S along	Many old oaks on the	274,276

the edge of scrub and young planting, past the badger setts of the harbour W bank, to the 'gateway'	harbour W bank	
A view S from the green badger sett (at photo 264) looks across wet woodland towards the main drain to its S	There is only a faint trace here of the old field boundary bank continuing S, as hinted at on the LIDAR image	265
The curved dyke continues W, beyond the old field shown on LIDAR, until it reaches a very boggy stretch in the SW corner of the wider enclosure. M/S birch **CLW016** is on the western end of the dry part of the curved dyke, before it temporarily is interrupted westward by a boggy area. The curved dyke then turns N, running N to meet the 'Lidar' bank and ditch, and as a double bank runs N to the W end of the new castle S moat	NB: N of where the E-W 'Lidar' bank and ditch meet the curved dyke is described as Cpt F. W of the curved dyke was visited only briefly and is described as Cpt G. Since the photos of the western half of the curved dyke were taken while walking south and then east, it is best to show them in that direction as follows:	
The curved dyke, which here has a ditch on both sides, runs south from its junction with the Lidar bank and ditch	There are frequent cross drains and some seem to be deliberate links between the two ditches	333,334,335
View across the bank and double ditch into the woodlands to the E, which are very flat and not wet at this point	This woodland has the appearance of having once been arable fields	336
The bank and double ditch nears the SW corner of the enclosure		337, 341, 342,343
The woodland in the SW corner of the enclosure is now very wet in parts	Alder and birch wet woodland	344
At the SW corner the bank curves eastwards	Again with breaks in the bank (346). Just E of this gap is a big old oak stool on the bank (347)	345, 346,347,348,
View into woodland to the N	Wet & mixed woods in Cpt E	350
Bank and double ditch continues E		351
View back W towards curve of SW corner	Large oak with holly (347) seen in reverse	352
Wide 'washed out' area S of the curved dyke	It looks as if this area has perhaps been eroded by the sea or by floods at some stage?	353
Bank and double ditch continues E	Difficult to follow the bank here due to numerous wet patches and gaps	354, 355, 356

Bank now drier once E of the SW corner and a large oak stool on top of it	Holly and hazel on bank adjacent to the oak stool (358)	357, 358
Wet alder woods adjacent to the bank		359
View looking back W, bank curving to NW	Shot includes **CLW016**	360
Final stretch of the S section of the curved dyke looking E towards the old harbour	This is a dry section of bank, with wet woodlands on the S side of it, and no obvious deep ditches	361

Cpt F. Old woodland SW of New Castle

At the prominent big alder (**CLW015**) on the drain described on the boardwalk (section D photo 221), a now silted up bank and ditch heads due W. This feature is clear on LIDAR but is not shown on any old maps.	The big alder **CLW015** is photo'd again. The beginning of the E-W bank and ditch (= 'Lidar bank')	221,285 284, 286
Following this 'Lidar bank' W one passes many old stumps amid much younger growth, then an old dead oak pollard. [NB this Cpt F being described lies N of the Lidar Bank, and S of the New Castle south moat]	Old oak stump on the bank Pollard oak on N side of the bank, with 'ropey' strengthening 'muscles' under the horizontal branch, a feature seen more commonly in birch	288 289,290
Not far N of this oak pollard away from the bank, is another outstanding group of veteran oaks	This large oak stool is also seen from the boardwalk (211), but is hardly accessible due to being surrounded by very marshy ground	291,292
Following the bank W - now very overgrown, and with young planting on drier ground	A large fallen willow with a mass of new shoots (293). Beech plantation here (297), similar to that on the old field just west of the harbour	293, 294,295, 296,297
The 'Lidar' straight bank and ditch continues W until it meets a second bigger bank coming up from the S (which is a continuation of the 'curved dyke' around enclosure E)	Mixture of middle aged trees of many native species, and occasional oak stumps	298, 299, 300
N of the junction with the Lidar bank and ditch, the bank heading N is more complex, with a ditch on both sides of the main bank and then this develops into a full double bank and ditch		301, 302, 303
This double bank runs N and meets the improvement period drain running along the SE corner of Cpt K. Then the double (now treble?) bank and ditch runs N to meet the SW corner of the new castle S	At this point there is a huge and spectacular old oak stool on the presumably older (E) bank of the double bank	304, 305, 307 315,316,319 327,329

moat		
This big oak stool has survived almost on an island of bank, amidst very wet conditions	Big alders and a ropey stemmed birch just to the N of the oak stool	306, 308,311
Then just S of the new castle moat is a drier 'island' with big old oaks of various tree-forms.	Oak 310 is clearly a previous stool, with one now dead stem partly fused with the main stem	309, 310
The older E bank of the double bank seems to end at a group of oak stools and holly (314)	The area west of the double bank is described as Cpt K	314
Heading back S the double bank is viewed in reverse, with the older E bank now on the LHS		320,321,322, 324 331

Cpt G. Central woodland: W of curved dyke, E of central N-S drain and N of main drain

View into Cpt G from the SW part of the curved dyke heading S	Young plantation with tubes and also much natural regeneration, amidst large oak stumps and fallen dead trunks	332
A little further S on the curved dyke	Further young plantation with oak stumps	338,339,340

Cpt H. South Wood (S of main drain)

Starting at the car-park in the SW corner a trail runs alongside the southern boundary of Caerlaverock wood to Back of Woods.	The open oak woodland on private land just E of the public road has a southern boundary of a bank and ditch with a line of oaks of impr age.	72
Beside the path are scattered oaks well outside the old southern bank	These may be either self sown or planted later. Many are short and 'scroggy' due to exposure and poor growing conditions	71, 399,401
The old wood bank cuts across the Castlewood Cottage garden (seems unrecognised for the historic feature that it is).	The old woodbank is cut through in places for drainage, and yet is clearly visible on the ground and as shown on the LIDAR image.	74, 366, 73
N-S drainage ditch marks the end of the garden and meets the old bank, with massive low fused m/s oak **CLW022** on the bank (ie the main S bank of Castle Wood) at this point.	Large oak m/s on this drain, just N of the bank	365
Then the S boundary bank is obvious at	Oaks of various tree form are	368, 369, 76,

least until the trail bridge is reached	growing on this bank, often with m/s oaks on the inside (N) edge	373
Above the bank is a continuous stretch of wet woodland reaching N to the line of what seems to be an old fluvial bank formed by past sea incursions (this natural bank is visible on LIDAR)	This is a high quality natural woodland habitat here	364, 370, 372, 77, 376, 382, 387,
Path meets old bank and diverts S		374, 375
For the next section of path, there seems to be a double bank and ditch	old m/s oaks on each bank now	79, 80, 378, 383,
Then the bank continues until the bridge	Old oaks all along this bank, many m/s on inside edge of bank (eg 385). Also skirted oak of modest size **CLW023** (380).	379, 380, 381, 384, 385, 388, 389
The recently repaired footbridge crosses a deep drainage channel which takes most of the water from the main drain which runs W from the old harbour	This cross drain seems to be a late improvement and is not shown on the 1st Ed OS map	398
Huge fallen pollard oak **(CLW024)** on the old bank	Pollard **CLW024** is on the outer (S) edge of the bank	386, 390
E of the pollard, the bank becomes more difficult to follow and is washed out in places or overgrown		391, 392, 397
A large m/s oak marks the end of the 'navigable' southern bank	**CLW025** marks this point	393, 396
At this same oak, a smaller bank runs N into a very wet area	This bank is visible on LIDAR and must be an old field boundary	394, 395
S of the path there is an extensive area of scrub, with wet woodland at the E end	LIDAR and the oldest maps show that this SE area used to be enclosed within the main rectangular enclosure	82, 83

Cpt I. Bowhouse Wood (West)

W of the public road, and just N of the SW carpark, is a line of alders along an impr age drainage channel	This drain takes water from the main drain which runs W through Caerlaverock wood from, the Old Harbour area	97, 98, 99, 100
Main drain of Caerlaverock wood (historically) crosses under public road (101)	From the public road the drain runs along the N edge of the cottage garden	101, 102, 103, 104
A short way in from the public road is the old N-S boundary bank and ditch, firming the W side of Caerlaverock Wood rectangular enclosure	The woodland to the W of the ditch is secondary, of sycamore, alder, birch etc. Immediately E of the ditch is an old bank with big oaks,	105, 106, 107

	mainly m/s.	
Large sycamore in secondary woodland on LHS of image, looking along old bank and ditch	Big Scots pines in garden close to where old ditch enters garden.	108, 109
Following the old N-S bank and ditch N	Large m/s oaks on the bank, including recorded oak **CLW001** (field record report)	110, 111
In photo 112 another drain comes in from the NE to meet the western woodbank	Photo 113 shows the view NE along this probably impr period drain. N of this drain is dealt with as Cpt J	112, 113, 114, 116, 119

Cpt J. NW Woodland

N of the cross-drain, the old western woodbank supports some amazing veteran oaks	Also the bank here is at first very wide, not just a narrow bank and ditch. Immediately E of the oak bank the land is very wet, but high quality woodland habitat within Cpt J.	115, 117, 120, 121
The bank now runs close to the public road to the NW corner of the wood	Very large oak m/s trees continue along this more narrow bank, including recorded **CLW002**	122, 123, 124, 125, 130, 131
The next large oak stool to the N is truly magnificent	Recorded as **CLW003**	126, 127, 128
Wet woodland immediately E of the bank	As with many areas of wet woodland in Caerlaverock this looks to be good habitat botanically, and for biodiversity in general. There is a patchwork of old woodland in Cpt J shown on the 1st Ed OS	118, 129, 132
Opposite the cottage Bowhousepark, on a sharp bend in the public road, is the NW corner of the main rectangular enclosure of Caerlaverock wood.	Now the large bank and ditch with old oaks on it runs E along the lower edge of fields towards the new castle.	173, 171
To the S within the woodland are some tall veteran oaks	The 1st Ed OS map shows a small patch of woodland here c 1860 amidst largely open land. Now this area has young secondary woodland and planted conifers. This N boundary is another complex one, not just a single bank and ditch	172, 170
A small spinney of heavily browsed oaks	This outlying wood is clearly	168,167, 164,

with bare roots survives in the field N of the old bank and ditch	shown on the 1st Ed OS	163, 162, 161, 160, 159
There is another open-grown skirted oak just south of the spinney across the current fence		169, 166
View of the spinney across the open field		133
Views North to the ancient hill-fort Wardlaw	This high viewpoint (which we did not find time to visit) has a clump of beech on it	164, 363
Drain heads S from midway along the N boundary	For convenience we are using this drain as a boundary between Cpts J and K. We did not have time to look into the plantations and secondary woods in these areas, but note with interest the beginnings of a novel working arrangement to thin and improve these woods.	165

Cpt K. NE Woodland

Continuing eastwards along the northern boundary bank from the central gate	Oak beside the gate is a noticeable landmark tree	158
Mixed young plantations in Cpt K, S of the boundary bank	We did not have time to look into the plantations and secondary woods in the northern part of Cpt K	157
These views of the N bank show clearly how the old bank and ditch is well inside the current field boundary, and there are hedgerow oaks and other trees on the edge of the improved field, as well as old oaks on the old bank	Photo 148 shows a moderate sized oak on the internal bank	156, 155, 148
Occasionally there are spectacular old oaks on the line of the impr hedgerow rather than on the old bank	Three such oaks, of differing tree form, are illustrated here on the line of the field hedge. However the 1st Ed OS shows a tongue of old woodland stretching E of the spinney which could account for this group of remarkable veteran oaks.	154, 153, 152, 151, 150, 149
Further E along the boundary bank is a wetter area with a dead m/s oak (**CLW007**) of some size and age	Also the mixed nature of the plantation behind the old dead oak is very obvious here. NB most of Cpt K is shown as open land on the 1st Ed OS map	147, 146, 174, 144, 143, 142, 141

Near the NE corner of the boundary bank and ditch is a remarkably large m/s oak **(CLW006)**	This oak is definitely on the old bank and not on the field edge.	140, 139, 138, 135
At the NE corner of the boundary bank and ditch is a large Sitka spruce	The ditch curves strongly round at right angles heading southwards here. The new castle is visible through the spruce	136
Two views of the impr style ditch running S from the NE corner	The ditch N of here to the NE corner is barely accessible, but it must run parallel to the W bank of the new castle moat. This can be seen on LIDAR	312, 313
The boundary ditch of Cpt K runs S and close to the medieval bank described in Cpt F	At this point there are two, maybe three, banks in parallel!	315, 320
Across the ditch to the NW is a plantation on what used to be a field in the 19th C and on Wells' plan of 1775	Photo 318 looks across the ditch to a spruce plantation which has not yet been all felled	318
View of the plantation area in Cpt K, with a large alder stool growing on flat land	The alder must have colonised part of the old field. The 1st Ed OS does show a small strip of woodland along the S edge of (our) Cpt K	317, 328
Just to the S the double bank is more visible	The central bank in this photo (with an oak stump) is the main medieval bank which runs S to enclose Cpts F and E	321
The next photo looks slightly westwards to show the ditch running along Cpt K		322
Now the ditch diverges W from the old bank	That ditch runs W then S to join with the central drain between Cpts J and K, then S to join the main drain. However that confluence is just W of where the new drain has been installed. That new drain takes most of the water from Caerlaverock Wood to the sea through the footbridge over the trail (Photo 389) as described in Cpt H	323, 325, 330

Appendix 2 Glossary of main tree forms

There are three main types of tree form: maiden, coppice and pollard, with variations in all three. In Scotland, a 'scrogg' is a further important tree form, as are air trees and phoenix trees.

Maiden
A maiden tree is a tree growing more or less naturally, either planted or naturally regenerated, and which has a main single stem and has not been lopped or topped, although it may perhaps have been pruned, or it may be completely un-touched by man. Of course that tree can be part of a stand that has been thinned. Most modern forestry deals only with maiden tree forms.

Coppice
Coppicing is the repeated cutting of broadleaved trees close to ground level to encourage regrowth with many stems; this produces small pole sizes over a short rotation. Usually whole stands are dealt with in this way as plenty of light is required to allow coppiced stools to send up new shoots. If occasional maiden trees are retained within the coppice, this is termed coppice with standards, an important woodland management system in past centuries.

Coppice stands had to be protected from grazing livestock for several years after cutting, and many old coppices still have surviving boundary banks or walls of turf or stone. What we now cannot see is that many coppice stands were also protected by temporary wood and stick fencing, or dead hedging as it is now known. Historically this temporary fencing was known as **'stake and rice'**, rice being an old Norse word for sticks or cut branches.

Coppicing survived into modern times as a technique, despite the costs of frequent fencing and the need to be vigilant in protecting the re-growing stools from livestock and deer. Coppicing survived in some districts because it provided a number of unique woody products, such as barrel staves, charcoal, tanbark or poles for hurdle-making or for hop growing etc. However most of those uses and trades are themselves now bygones. Nevertheless much coppicing is still carried out through the revival of interest in woodland crafts and old trades, as discussed in the Woodland Crafts handout.

Coppicing is also encouraged to maintain open and light glades within some woodlands to support traditional biodiversity (such as butterflies and certain woodland plants) which depend on well lit glades. It is therefore common to find active coppicing in many woodland nature reserves.

Pollard
Pollarding is very different - it means cutting trees roughly at head height to keep re-growth out of the reach of livestock and deer. Thus it is a system of grazed pasture woodlands, wood pastures, parklands, or other trees on farms.

Interestingly from the woodland archaeology point of view, a pollard may be found today within dense woodland, but if the tree has been worked by pollarding in the past, it retains that tree form for the rest of its life. So the past management of that woodland or stand can be inferred from current tree form. Pollarding was primarily a farmer's way of dealing with trees, and has traditionally been looked down on as a technique by foresters and landowners since it spoils the timber value of the tree. Pollarding is now carried out mainly on urban trees as a form of tree surgery, or occasionally to maintain historic landscapes.

Scrogg

We sometimes describe a tree as 'scroggy' or a 'scroggy pollard'. Scrogg is a Scottish term which describes a stubby squat tree form, rather like a low pollard. Scroggy trees are common in Scotland, especially in old pasture woods in upland situations, and may sometimes be the result of grazing pressure rather than formal management or cutting.

Air trees

A common feature of upland woods, especially wood pastures, air trees are where a tree has seeded into the stem of another tree. Rowan is the most common species found as air trees, assisted by birds eating and spreading their fruit as they fly from tree to tree. Birch is probably the second most common air tree type in upland Scotland.

Phoenix trees

Another common phenomenon of Scottish upland woods, a phoenix tree is a tree which has been blown over but which has remained rooted and then sends up new vertical shoots.