Roman Sites and Lidar

Scheduling enhancement report

Part 1: Survey and excavation





Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

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G2304 ROMAN SITES AND LIDAR

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1. INTRODUCTION

A project examining the Roman roads of Gwynedd was initiated in 2002/03. This followed a study of Roman fort environs. The first year of the project consisted mainly of scoping and examination of the extent of the available data. The second year, 2003/04, adopted an approach set out by CPAT in *Roman Roads in Mid- and North-East Wales* (Silvester and Owen 2003).

The 2003 to 2007 phases of the project involved a desktop assessment of existing records and other sources, GIS mapping of the known and suspected roads in the region and the production of a report. The final report, *Roman Roads in North-West Wales*, illustrated the current state of knowledge, provided a hard copy of the GIS data and highlighted where further work in both documentary assessment and fieldwork is required (Hopewell 2007). Proposals were made for scheduling at eight locations. Three of these locations required further evaluation work to inform the scheduling process, and the 2013-14 project aimed to assess these sites using trialexcavation in order to ascertain their form and survival.

Environment Agency lidar data has recently been incorporated into Gwynedd Archaeological Trust's MapInfo GIS system. Following information from two independent researchers, Bryn Gethin in Warwickshire and Hugh Toller in London, it became clear that lidar surveys had great potential to identify previously unknown lengths of Roman roads. An early success involved the tracing of a large portion of the previously unknown route of the Roman road from Segontium to Penllystyn (information from Gethin 2013). It is clear that Lidar surveys, even at the relatively coarse resolution of the Environment Agency data, are capable of detecting very low earthworks, particularly if they are large-scale features, such as Roman roads, prehistoric defended settlements and field systems. The second phase of the 2013-14 project aimed to re-examined the lines of the Roman Roads where their route was still in doubt using lidar data and targeted field visits. The majority of the results of this element of the project were directly incorporated into the publication *Roman Roads in North-West Wales* (Hopewell 2013) and are not included in the current report. One site at Bryn Castell near Cross Foxes required further assessment and the results of the fieldwork are included below.

2. METHODOLOGY

Four lengths of Roman road required assessment. It was decided that assessment using simple hand-dug trenches would be the most efficient method of acquiring information about the form, date and survival of the roads. Two metre wide (and in one case 1m), wide trenches were hand excavated across the full width of the roads and ditches (usually about 8m). Where only a short length of road was being assessed only a single trench was necessary. Longer stretches of road required additional trenches. The trenches were excavated down to the surface of the agger and to the bottom of the road would have caused unnecessary damage to the monument. In one case further information was requires and a section was cut through the road surface down to the natural substrate. The assessment of a 1.2 km length of road through a ride in a forestry plantation at Blaen-lliw-uchaf was achieved by recording sections through the road exposed in drainage ditches.

Photographic, drawn and written records were made of all sites. Detailed drawings of stone and pebble metalling on the road surfaces were made by digitising vertical photographs. These were taken using a digital SLR mounted on an obliquely held 5.5m long aluminium pole. Minor rectification was applied using Adobe Photoshop with reference to markers laid out in a 2m grid on the road surface.

3. RESULTS

3.1 BRYN CASTELL NEAR CROSS FOXES, DOLGELLAU (PRN 38166)

3.1.1 Background

Road RR69b/RRX96 running from Brithdir to Pennal is one of the least-well understood in Gwynedd. A direct route south would encounter the Cader Idris massif. Two main routes running to either side of the mountain have been published (see Fig. 1). The first, RR69b running to the east, was proposed by Margary. The second, RRX96, running to the west was favoured by Jones (1959, 211-2), St. Joseph (1961, 129-30) and Bowen & Gresham (1967, 252-3). Margary's route is the most direct running south from Brithdir along Cefn y Clawdd and then along an old road across the highlands to the Llefenni Valley. The OS recorded that the route was very eroded and probably not Roman (John Rigg F.I. in OS linear RR69b 1977). Much of this evidence has subsequently been destroyed. The most recent line of the old track has mostly been superseded by a narrow asphalt road. Occasional lengths of earlier road have survived and have not been affected by the recent upgrade. This is, in most cases, in the form of a terrace with the modern road overlying part of it although hollow ways also survive in places. At SH76071402 the modern track curves away from the earlier line. A 4m wide terrace and a possible 5m wide agger, follow the more direct route. At SH75911366 a 4m wide terrace is cut by a narrow hollow way (Hopewell 2013, 75). There was clearly a well-constructed road of some antiquity running along this route and it was never turnpiked (Dodd 1925). The fragmentary remains fall short of proving its Roman origins and no extant remains have been identified along Margary's proposed route along the Llefenni valley through Corris and then along the Dovey Valley to Pennal. Faced with a distinct paucity of evidence, the Ordnance Survey concluded, during their survey of the road in the 1970s that there was no Roman road along this alignment and favoured the western route.

The western route (RR96) is equally problematic. It follows an old road known as the Ffordd Ddu in a wide loop to the west of the uplands. The route is very indirect and at 32km is 10km longer than RR69b. This is considerably longer than the usual 20m stretch of road between two forts, designed to be traversable in a day's march. There are several phases of road along this route including two or three phases of turnpike. Again no proven extant Roman road has been discovered.

Both routes were examined during the Cadw grant-aided Roman roads project and no further proof was discovered for either route although the eastern route seemed to be the most likely due to its relatively direct route (Hopewell 2013 25-27).

3.1.2 Review of lidar data and fieldwork

A straight and direct lidar anomaly was identified close to Margary's route by Hugh Toller (pers. comm.) in 2013 (Fig. 2). The site was visited in late 2013 and the line of the anomaly was found to run through bogs, semi-improved pasture and rough grazing. Most of its line was overgrown with

rushes, moor-grass and sphagnum and the earthwork detected by lidar could not be traced with any certainty. This discrepancy was partly due to the ability of Lidar survey to "see" through vegetation and thus produce an un-obscured ground model of features not visible to the naked eye.

The second phase of fieldwork consisted of marking out the line of the anomaly with bamboo canes using high resolution GPS survey equipment. This followed a series of points along the line of the road that had been transcribed from lidar survey registered in MapInfo (GIS software). Probing using a narrow, steel road-pin revealed a hard surface a few cm below the turf. Erosion from a modern track allowed a small area of the surface to be seen. It was found to consist of hard-packed clayey gravel and small stones, and probing suggested that it was about 5m wide. A 5m width and gravel surface are good diagnostic features of a Roman road. No ground disturbance was possible at this time because the anomaly runs through the Cader Idris Site of Special Scientific Interest.

The necessary SSSI consent was obtained and fieldwork recommenced on 09/12/2013. A 200m length of the anomaly between SH76481640 and SH76441620 was selected for more detailed investigation. The northern half runs through bogs denuded by peat cutting; the rectangular overlapping cuttings are clearly visible on 1m resolution lidar survey. The southern half runs through improved pasture. This area has been ploughed, probably during WWII. Two methods were utilised to investigate the anomaly.

The extent of the buried surface was again investigated by probing using road-pins. The edge of the surface was marked and then surveyed using a high resolution Trimble GPS system. The results are shown on Fig. 3. The surface was found to be between 4.8m and 6.5m wide and was easiest to locate by probing in the bogs at the north where a fairly straight-edged feature was recorded with an average width of about 5.5m. The surface was also recorded in the pasture but the edges were less easy to detect. A metal detector survey was carried out along the line of the road but nothing was found. It was decided to excavate two assessment trenches, one in the pasture and one in the bog in order to compare preservation and morphology. Trench 1 was centred on SH76461623 and trench 2 SH76471633.

3.1.3 Excavation

Trench 1. (Fig. 4)

An 8.4m, x 2.2m trench was excavated across the full width of the road and side ditches. Between 0.2 m and 0.3m of peaty ploughsoil was stripped by hand revealing a gravel and clay surface with protruding larger angular stones. Narrow gullies could be seen on either side of the surface. The northern half of the trench was then excavated down to a depth of 0.8m to reveal a section of the road (Plate 1).

The earliest deposit (017) was light brown silty peat containing preserved root fragments. This was not fully excavated due to a constant flow of water into the trench. Probing suggested a somewhat variable depth, perhaps 0.3m above a firmer deposit that was probably the glacial substrate. Overlying this was a 0.25m deep accumulation of reddish-brown fibrous peat (016) containing wood fragments and layers of bark particularly towards the top. This could either represent a period of clearance of scrubland, or possibly natural dieback due to waterlogging. The surface of the wood was only well-preserved in a few places and provided no evidence for deliberate clearance. The

layer of bark could have been stripped from cleared wood but could also be a result of different rates of rotting of wood and bark. A thin layer of slightly gleyed peat (015) and an accumulation of fine, almost black, peat (014) overlaid 016, probably indicating a buried soil/turf horizon. This also showed that the clearance or dieback pre-dated the Roman road and probably occurred in the late Iron Age. The base of the road was sitting directly on top of the buried turf (014). There were shallow cuts at either side [022] and [023] containing a broken line of randomly orientated stones, forming a rough kerb. The lower part of the agger (013) contained frequent stones typically 0.1m to 0.2m in diameter that were almost all laid directly on the former ground surface. These were a mixture of rounded field stones and more angular rocks, either derived from the subsoil or from nearby outcrops. The stones were covered by, and set in, a matrix of hard packed grey silty clay containing gravel and small (less than 10mm) stones. This was fairly uniform throughout the agger and survived to a maximum depth of 0.18m. The upper surface was uneven and at its lowest level away from the large stones, presumably the result of greater penetration of the plough where there were no rocks. There was a slight camber, most noticeably from the centre of the road to the eastern kerb. The total width of the agger was between 5.4 and 5.6m. Small drainage gullies [018] and [019] on either side of the agger were defined by slight primary fills of gravel washed off the road surface. These were 0.1m deep and 0.3m wide on the west and 0.2m wide on the east, both cut into the buried ground surface.

Trench 2 (Fig. 5)

The second assessment trench, with dimensions of 8.5m x 1.9m, was excavated in the unploughed boggy land to the north of the pasture. The aim of the excavation was to assess the form and preservation of the road. The trench was therefore only excavated down to the level of the road surface and side ditches (Plate 2). The agger (030) was well defined and 5.9 m wide. The surface was level, and consisted of hard-packed silty clay with variable amounts of small stones and gravel and incorporated several larger flat slabs. The edges were defined by irregular kerbs of small stones and there was only a very slight camber. The agger was laid directly onto the firm yellow-orange silty-clay glacial substrate (032). Side ditches were poorly defined. A very slight cut [034] on the east was filled with grey silt. There was a broader, shallow peat-filled drain [035] on the western side. A thin 0.04m accumulation of dark brown peat (029) was overlying the road and filling the ditches and this was sealed by a thin (0.02m) layer of black peat (028). This was probably a turf line that became established over the road and ditches immediately after they fell out of use. This was in turn overlaid by 0.16m of fibrous light brown peat (026/027), which presumably formed after the surrounding levels of bog grew to cover the overgrown agger. This horizon may have been truncated by peat cutting; there are clear indications of a turbary in this area on the lidar survey.

3.1.4 Conclusions

This road includes several diagnostic features of Roman roads as found in the uplands of Wales (Hopewell 2013, 10-11) namely, a width of over 5m, a raised agger surfaced with gravel and clay/silt, small side ditches and a very direct line. It was beyond the remit and funding of the current project to obtain multiple radiocarbon dates from the peat deposits so no absolute dating was obtained. Turnpikes are however the only other type of road that could pre-date modern mapping and include the diagnostic features listed above. The rough kerb is typically Roman, as opposed to a continuous kerb or revetment usually found on a turnpike. The relatively slight stone and gravel agger has

parallels in other roads in the region (e.g. Hopewell 2013, 39 and 49) whereas turnpikes, at least in theory, should be somewhat more substantial. The line of the turnpike in this area is also well documented (Dodd 1925) and runs along the west bank of the Afon Clywedog on the eastern side of the modern road. The morphological evidence is therefore sufficient to demonstrate that this is the line of Roman road RR69b and proves the more direct line to the east of Cader Idris.

3.2 CAER TYDDN (PRN 17778)

3.2.1 Background

John Rigg and Hugh Toller (1983, 11) proposed a road from Brithdir to Long Mountain which was later retracted when it was realised that most of the recorded features were turnpike road (Toller 1997). Part of this route consisted of a link from RR66b to the East of Brithdir to RRX73 at the west end of Bwlch Oerddrws (Fig. 6). Aerial photographic evidence has subsequently shown that there is little doubt that a Roman road runs along this "link" route even though much of it lies beneath the later turnpike (Plate 3). This was published in Snowdonia from the Air (Crew & Musson 1996, 31) and is a superb example of the value of aerial photography in the study of Roman roads. Some of the features are quite difficult to see on the ground but are very clear from the air. The turnpike road is still in use as a farm and forestry track and has been resurfaced although it still retains many original features, in particular stone revetments where it is terraced into the hillside as it approaches Bwlch Oerddrws. The presence of the earlier Roman road is demonstrated by numerous quarry pits alongside the turnpike. These are typically Roman, irregular and generally set back from the edge of the road by a few meters. These are of distinctly different character to the turnpike quarry pits which are less frequent, more regular and immediately adjacent to the road. The two phases of road diverge at SH78821790 and the Roman road can be traced as a very clear agger in unimproved land, again with associated quarry pits (Fig. 7). It is then visible running through semi-improved pasture through enclosed fields at Caer Tyddyn. The earthwork is less pronounced here and has in places been adopted by field boundaries so is probably not as well-preserved as in the unimproved land although survival is probably still relatively good. The turnpike continues further to the east to join the modern road over the pass.

3.2.2 Excavation (Fig. 8)

A single trench was excavated in order to assess the form and preservation of the road. It was decided not to section the agger if good diagnostic features were present because this would damage one of the best preserved lengths of Roman road in the region and not necessarily produce much additional information.

The extant road, shown on Fig. 7, was surveyed using a Trimble GPS surveying system and additional details such as quarry pits were added from a rectified version of the aerial photograph (RCAHMW 95 CS-0833).

A single trench with dimensions of 9.75m x 2m and centred on SH78831786 was excavated by hand down to the level of the road surface (Plate 4). The agger had been laid directly onto the yellowishbrown silty-clay natural substrate (011), at least where observed at the edge of the road. The road surface (007 and 008) comprised the, by now familiar, mixture of hard-packed silty-clay, gravel and small stones with occasional larger stones. The road was 6.8m wide and strongly cambered, the centre being 0.23m higher than the eastern side and 0.38 higher than the western. The central 3.6m of the road (007), was the most strongly cambered and contained a higher proportion of gravel and small stones than elsewhere. This was interpreted as a repair or partial resurfacing. The edges of the road (008) were flatter and there was wear, possibly wheel ruts on the western side. There was a rough kerb on the eastern side that was set into a shallow cut [013]. No side ditches were present; the natural (011) was sealed by a hard iron pan on the east that was in turn sealed by thin silty deposits 011 and 012 washed off the road. The natural ground surface falls away from the edges of the agger so ditches may not have been necessary

Initial clearance of the 0.12m of turf and peat only revealed the central 3.6 m of the agger. The lower parts of the road surface were covered by a deposit of mid grey silt (005), presumably material washed off the resurfaced area, perhaps indicating that only the central part of the surface was used after resurfacing. An accumulation of dark peat (004) over all but the top 1.1m of the road was probably the first turf layer that was established as the road fell out of use, with subsequent layers of soft mid brown peat (003) dark peat (002) and turf (001) indicating a continuation of the general accumulation of peat in the area.

3.2.3 Conclusions

This was an unusually wide road at 6.8m wide compared to the more usual c. 5.0 to 5.5m in upland north-west Wales. It was also very strongly cambered and had probably been resurfaced along the central 3.6m possibly becoming narrower as the outer edges became overgrown.

3.3 MOEL YR WDEN PRN 17855

3.3.1 Introduction

The road running south-east from Tomen y Mur is, on current evidence, the most complete Roman road in Gwynedd. The route was first traced in detail by H C Irvine and published in the Bulletin of the Board of Celtic Studies in 1956. Much of his proposed route was dismissed by the Ordnance Survey surveyors in 1973 and the RCAHMW also considered it unproven. In contrast, recent work on this route by Crew and Musson, Kelly and the Roman Roads Project in 2003/4 have shown Irvine's work to be one of the more accurate published accounts of a Roman road in Wales (Hopewell 2013, 44-51)

The road running down to Cwm Prysor from Llyn Hiraethlyn is clearly visible on an aerial photograph by Crew & Musson and Environment Agency Lidar survey. These show a pronounced zigzag with quarry pits on both sides of the road. The road runs obliquely across the valley bottom before joining a modern farm track. This joins neatly to a zigzag running up the east side of the valley that was discovered in the 2006 season of the Roman Roads Project (Fig 9). The zigzag is somewhat eroded and appears to have had some recent use, possibly during twentieth century military exercises. This leads to a well preserved agger at the top of the slope, with associated quarry pits (Map 18, PRN 17855). The route is well preserved as it climbs to Moel yr Wden. The zigzag and agger are the subjects of this investigation.

3.3.2 Field-survey and excavation

Moel yr Wden zigzag

The zigzag running up the steep slopes to the east of Y Gors links proven lengths of Roman road and is therefore most probably Roman itself. It is however considerably wider, at 8 to 10m, than the zigzag on the western side of the valley. Small test pits were dug and the area was metal detected.

The test pits revealed a gravelly surface in places that could be the remains of Roman metalling. The inner 3 or 4m of the surface consisted of angular quarried and crushed stone that was almost certainly later. Metal detecting quickly revealed considerable amounts of shrapnel and a complete 1916 No. 80 Mk VI artillery shell fuse made by British Time and Percussion. It was clear that there had been considerable disturbance in this area and that some of the quarry pits adjacent to the road were either modern or were shell craters. No further work was carried out here because of the danger of uncovering unexploded ordnance.

The road changes character at the top of the slope where it continues as a 6 to 8m wide terrace following the contour above a small boggy hollow, there are possible signs of widening on the southeastern side of the terrace but the inner edge is overlaid by a ruinous field boundary of some antiquity. It could be medieval and certainly predates the military activity in the area. This indicates that there is the potential for good survival of at least some elements of the road although there has probably been some disturbance. The road then curves around the edge of a boggy area where it has been cut by drainage works before emerging onto boggy open moorland. It is visible here as low agger accentuated by a change in vegetation from predominantly green sphagnum moss to lighter coloured moor grasses on the line of the agger. There are substantial quarry pits on the southeastern side.

Excavation Trench

A 9.4 x 1.0m assessment trench was hand-dug in the open moorland at SH774735719. The trench was excavated down to the road surface and down to the natural substrate on either side of the road (Fig. 10).

The substrate (012) was distinctive very light grey, hard, stony clay. A layer of soft black peat was directly overlying this (007 and 017). The road agger was cut through these natural deposits on the south-eastern side [011]. The road itself was not sectioned but it was clear that at least the south-eastern edge of the road had been cut into the natural. The layers of silty redeposited natural (008) and stony clay (020) making up the body of the agger were set in a shallow cut with the edge of the agger roughly level with the top of the natural peat to the south-east. No ditch was identified and it seems likely that none was needed because there would have been natural drainage into the bogs below. The north-western side of the road had been terraced out over a thin layer of peat the top of which was very uneven suggesting that it had been partly cut away during the road construction. The edge of the agger consisted of a 0.22m depth of clean, stony, redeposited subsoil (019). A further deposit of clean, yellow and grey, stone-free redeposited subsoil (013) was piled over the natural peat and against the outer edge of the agger, edge of the terrace (018). No ditch was identified on this side of the road either, although it is possible that there could have been a drain

beyond the edge of the trench. A ditch would, again, have been largely superfluous as water would have run off the road surface into the blanket begs below.

The overall width of the agger was 5.8m, not including the extended terrace. The surface was slightly cambered and in good condition with no signs of ruts. The highest part (009) was surfaced with rounded and sub-angular stones 2-5cm in diameter in a matrix of reddish hard-packed clayey silt. The south-eastern edge was more uneven and contained stones up to 15cm long. The pebbles petered out on the north-western side with the top of the agger becoming more gravelly (023). The top of the lower edge of the agger (019) was very clean and may not have functioned as a runningsurface having been covered by grey gravel 021, either deliberately or during the initial erosion and wash-off of loose material from the road surface. The contemporary ground surface on the northwestern side is indicated by a thin layer of gravel washed from the road surface in the base of context 015 which gets progressively more peaty and less gravelly towards the top of the deposit indicating the accumulation of peat during the lifetime of the road; 014 is probably a continuation of this process. Mixed deposits of clean (004) and gravelly/silty, peat (005) on the south-eastern side may indicate material cleaned from the edge of the road as they underlie the initial accumulation of peat (003) over the edge of the agger. The road and its surroundings are sealed by 3 layers of peat accumulation (001,002 and 010) that is 0.12m deep over the road extending to 0.42 m as the original ground level falls away to the north-west.

3.3.3 Conclusions

This road is a standard width but the extended un-metalled terrace is unusual. This was presumably constructed to support the edge of the agger that was terraced out over boggy land on the north-west and was used in preference to a stone revetment. It required the addition of a large amount of material to the outside of the road. It should be noted that there was a nearby quarry pit and the terrace may have been a relatively isolated feature negotiating a difficult feature in the landscape. This is difficult to assess, however, because the topography has changed since the Roman period. The road would have run along a raised and fairly obvious terrace. Subsequent accumulations of peat have since filled in the lower ground to the north-west.

3.4 BLAEN-LLIW-UCHAF PRN 17524

3.4.1 Introduction

The route of the Roman road through the uplands to the east of Prysor, below Moel y Slates, is almost certainly correct (Hopewell 2013, 48-9). The road currently runs through a fire-break in commercial forestry (Fig 11). The Roman character of this route was confirmed by Richard Kelly during an excavation to investigate the feature before the planting of the forestry in 1983 (Kelly 1986). He cut a section across the road revealing a 4.25m wide agger with a surface of angular stones in a matrix of clayey soil. This was flanked by shallow side ditches (Fig 12). He reported that the road ran along the lower (south-eastern) edge of the ride and may well have been planted over (Kelly pers. comm. 2013).

3.4.2 Excavation

The aim of the project in this area was to reassess Kelly's findings and determine if the Roman road is preserved in the ride and assess its condition. An initial site visit failed to identify any definite signs

of the Roman road, a slight terrace could be seen along the upper edge of the ride but this was partially masked by upcast from drainage ditches. The ride was crossed by three deep ditches and it was decided that these presented the best opportunity to locate the road and record its structure (Fig. 13).

A subsequent field visit was arranged and the edges of the ditches were cut back to a vertical edge using spades and trowels. Three ditches were examined and two sections were recorded in detail.

Section 1 (SH79493561)

This was a deep stream that cut straight across the ride but turned about 30 degrees to the south about half way across. It was cut back, cleaned and recorded at this orientation. Fig. 14 shows the section, the angled portion has been rectified to produce the equivalent of a section at 90 degrees across the ride.

The agger of the Roman road was identified on the south-west side of the ride. The natural substrate (011) comprised light yellowish-grey clay containing numerous angular stones. A thin layer of gleyed silty-clay (006) and a layer of peat (005) overlaid this at the south-west side of the section. The agger of the road (004), consisting of a 6.0m wide and 0.09 to 0.2m thick layer of uniform grey clayey silt and small stones with some larger (0.05 to 0.2m long) pebbles on the surface, was laid directly on to the natural substrate or remaining peat (005). This indicates that the peat and probably some of the substrate had been cut way on the upper side to form a terrace. The surface sloped quite markedly to the south-west, dropping by 0.4m across the width of the road. It was also quite uneven with a 2.4m wide dip close to the centre. Ditches were clearly visible at both sides. The upper [012] was 1.1m wide and 0.3m deep. A deposit of gritty silt (008) on the edge of the agger appears to be upcast from ditch cleaning. The lower ditch [014] was a small slot 0.4m wide and 0.2m deep. The road was sealed by a 0.3m deep deposit of dark peat (003). This was covered by an uneven layer of upcast from the recent drainage ditches (004).

Section 2 (SH79383571)

This section was recorded in the side of a ditch running at 90 degrees across the ride (Fig 15). It is very close to the position of Richard Kelly's published section (SH79373571) and the ditch may actually have been formed from the excavation trench. The section recorded in the current project is similar to the published section although in this case it is definitely located in the centre of the ride as opposed to the lower edge as recorded by Kelly. The section was cleaned across the full width of the ride and only natural deposits were recorded on the lower side. The reason for the, admittedly slight discrepancy, is not clear although it was considerably more difficult to locate a trench accurately in 1983 without the benefit of current GPS and GIS technology.

The drainage ditch had been cut deeply into the natural yellowish-grey silty clay subsoil. This contained frequent angular stones. Overlying this was a layer of black peat (005 006 and 012). This was a natural accumulation; it was a little deeper under the road but did not appear to have been redeposited. A single piece of unworked wood was preserved in the top of the peat layer. It is not known if this was part of the original peat deposit or if it was a feature of the road construction. On the lower (south-western side) of the section the peat was overlaid by a deposit of grey, gleyed silty

peat (013). The deposits on the upper side of the road were truncated by a recent drainage channel [014] but only a secondary deposit of peat (010) was recorded here.

The agger (003) was built directly onto the peat layer (004). A small patch of the grey gleyed layer 013 survived under the road but it appears that the rest of this was cut away to form a terrace for the road. The agger itself was 5.6m wide and a maximum of 0.22m deep and consisted of hard-packed grey silty-clay with frequent stones. The surface was uneven with a slight dip in the middle, the stones were more frequent on the higher parts indicating the remains of a metalled surface and also suggesting that the dip was a result of erosion.

The ditch at the north-west end [008] was 1.2m wide and 0.3m deep, the base was defined by a thin layer of grey gravel washed from the surface of the road. The ditch on the lower side [007] was less well-defined being a 1.6m wide and 0.3m deep, shallow cut through natural deposits 012 and 013. The base of this was again defined by gravel washed from the road.

The road and ditches were sealed by a somewhat uneven layer of dark-brown peat 002/001 that could include some upcast from the modern drainage ditches.

Section 3 (SH79203590)

The third section was recorded on the north-east end of a deep drain cutting obliquely through the ride. The road was again clearly visible but in this case the *c*.45 degree angle of the cut would have made a drawn section somewhat meaningless. The location of the road and a sample profile were recorded and a photographic record was made of the section.

The oblique width of the agger was 9.4 m indicating a width at 90 degrees to the road of about 6.6m. The agger was a simple 0.14 m deep, uniform layer of grey sandy silt containing a range of angular stones from gravel to 30cm slabs. This was sitting on a natural light-grey gleyed horizon that was in turn overlying peat and the natural substrate. An approximately 1m wide ditch was visible on the southern side; the northern ditch appeared to have been cut by a modern drain.

3.4.3 Conclusions

The three sections clearly demonstrate that the Roman road is well preserved and running up the centre of the ride for at least 400m. The course of both the road and the ride deviate from the straight line at the north-western end of the plantation and the road has probably been destroyed in this area Fig 11. The road can be traced for about 100m to the south-east of section 1 as a slight earthwork along the ride and there is no topographical reason for it to deviate beyond this so there is a good chance of survival as far as the end of the plantation. The road has been preserved by the owners Fountain Forestry as specified during the initial planting. There is a potential long-term threat to the site which will come into effect during harvesting but mitigation should be straightforward now that the precise location and character of the road has been recorded.

There are some interesting discrepancies between the section recorded by Kelly and the three sections recorded here. Differences in the exact location of the agger can perhaps be explained by the slightly less accurate methods available for recording sites in featureless upland locations in 1983. Kelly recorded the width of the agger as 4.25m as opposed to 5.6m in the nearby section and over 6m in the other two. One possible explanation may be that the lower ditch on Kelly's section

was not actually a ditch. He notes that its fill was "indistinguishable from the material of the road". All other road sections so far examined have had silt and gravel washed off into the ditches to variable extents. The stones in the matrix of the agger do not wash off as easily as the rest of the material and the fill of the ditches tends to be markedly different from the compacted material of the agger. The edge of the road in several cases has been defined by a shallow cut containing variable amounts of larger stones ranging from a rough kerb to nothing more than slightly coarser agger matrix. The undifferentiated material in the "lower ditch" in Kelly's section could therefore be reinterpreted as the edge of the agger making the road 5.2m wide.

4. DISCUSSION

4.1 ROAD CONSTRUCTION

A total of 7 sections across upland roads were recorded during the project at elevations ranging from 220m OD at Bryn Castell to 513m at Blaen-Iliw-uchaf. Road widths were somewhat variable but all but one fell within the range of 5.4 to 6.0m (discounting the rather approximate oblique section at Blaen-Iliw-uchaf). This suggests that the estimation of 4.5 to 5.0m as the typical diagnostic width of a Roman road taken from the visible earthworks (Hopewell 2013, 10) may be a little narrow. The road at Caer Tyddyn was notably wider at 6.8m. This road apparently acted as a shortcut in the road system around Brithdir. It could be argued that this was a later addition, perhaps added after the abandonment of the fortlet at Brithdir. This could account for its somewhat anomalous morphology. If this is the case it indicates that the road system was maintained and improved after the abandonment of the majority of the forts and that the roads continued to be a significant part of the Roman infrastructure.

The construction of the roads obviously followed certain rules, they are a fairly uniform width, they are surfaced with material derived from the local subsoil and drainage was included in the design. Some features of their construction were, however, more pragmatic and dependant on local materials. Where large stones were available they were used as foundations and rough kerbs. The kerbs were sometimes set in shallow cuts along the edge of the road. The body of the agger in all of the excavated examples was derived from local subsoil, usually from nearby guarry pits. The material was not always the same as the substrate immediately beneath the agger and in several cases there was stony metaling, indicating some sorting of the raw materials, either by processing or by selection from different sources. The material always seemed to have a fairly high silt, sand and/or gravel content with variable but general low levels of clay. Again it is not clear how much processing was involved. The aggers were usually lightly cambered where not obviously worn and in two examples terraces sloped downhill. The height of the agger and level of preparation was variable. At Bryn Castell the agger appeared to have been laid directly onto an existing turf layer overlying peat in a wet bog in one section and in the other the peat had been removed and the agger built on the natural substrate. At Moel yr Wden a terrace was cut into and built out over the natural slope. At Blaen-Iliw-uchaf terraces were cut into the substrate, in other places the road was built on peat. At Bryn Castell the agger was again built on the natural substrate after removal of the peat.

Ditches seemed to be a pragmatic response to local drainage. They were not present where there was natural run-off taking water away from the road and where present, they ranged from almost insignificant slots to fairly substantial drains. The drains on the upper side of the road at Blaen-Iliw-

uchaf were particularly pronounced and this was the only place where there was evidence of ditchcleaning.

4.2 SURVIVAL, PRESERVATION AND THREATS

All of the roads examined during the project were well preserved apart from the zigzag at Moel yr Wden. The aggers showed variable evidence of wear, much of which probably dated from their use in the Roman period as all of the roads that had not been adopted by later tracks and highways appeared to have fallen out of use quite quickly and then become overgrown with peat. This suggests that there are many kilometres of perfectly preserved Roman road in the uplands of Gwynedd. The best preserved is probably RR68 pt2 between Tomen y Mur and Caer Gai. Well over half of this has almost certainly not been disturbed since the end of the Roman period. Other routes away from the intensively farmed coastal plains also include substantial lengths of undisturbed road, and there probably many examples that are buried in peat and currently unknown. This is a very important, and even after the recent projects, largely unexplored, archaeological resource

Levels of short- to mid-term threat are generally low; the inclusion of linear mapping of known roads in Gwynedd Historic Environment Record should ensure that major disturbance by plantation etc. will be unlikely. Infrastructure projects such as new roads and pipelines often take the same direct route through the landscape as Roman roads and could be a long-term threat.

4.3 FURTHER RESEARCH

The current project has aimed to gather as much evidence as possible about the form and preservation of some upland Roman roads in Gwynedd with limited resources, using minimally intrusive methods. This has produced much new information and has also identified several topics for further research.

4.3.1 Dating and environmental evidence

Almost all Roman roads in upland Wales remain undated. It is presumed that they were built soon after the construction of the forts but it is not known how long this building program took. There is also some evidence suggesting that roads such as RRN51 near Brithdir may be later additions (see above) but again when this may have occurred is unknown. Artefactual dating evidence is rare on remote upland roads but almost all are buried in horizons with good to excellent organic preservation. Multiple radiocarbon dates of peat or wood could provide dating evidence. Environmental evidence from the peat could also be significant with the presence of the Roman road in the peat column indicating a significant historical event.

4.3.2. Construction techniques

Larger scale excavation incorporating quarry-pits and sections through the roads could provide information about the construction of the roads. The material for the agger is presumed to be locally derived but it is not known if it was processed or used in its raw state, or if material from different quarry pits was used and stockpiled for different functions such as surfacing or foundations. Analysis of the agger, material in quarry pits and the natural substrate could provide further information. Larger scale excavation could also provide information about drainage patterns and general construction techniques.

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Fig. 1 Roman roads south of Brithdir (from Hopewell 2013, 26)



Fig. 2 Lidar survey, Bryn Castell, south of Cross Foxes (Environment Agency lidar composite 2012)



Fig. 3 Bryn Castell location of assessment trenches



Fig. 4 Bryn Castell - trench 1, plan and section





Fig. 5 Bryn Castell - trench 2, plan and section



Fig. 6 Cae'r Tyddyn, Roman road RRN51



Fig. 7 Roman road at Cae'r Tyddyn. Survey showing agger and quarry pits





Fig. 8 Cae'r Tyddyn plan and section



Fig. 9 Moel yr Wden Roman road showing zigzag and excavation trench



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Fig. 10 Moel yr Wden - plan and section



Fig. 11 Blaen-Iliw-uchaf forestry plantation showing Roman road



Fig. 12 Section across the road at Blaen-Iliw-uchaf (Kelly 1986)





Fig. 14 Blaen-lliw-uchaf section 1 (south-east facing)





Plate 1 Bryn Castell - Trench 1, section



Plate 2 Bryn Castell - Trench 2, surface of Roman road



Plate 3 Cae'r Tyddyn - aerial photograph (RCAHMW 95-CS-0833)



Plate 4 Cae'r Tyddyn - Excavation and view along earthwork of Roman road



Plate 5 Moel yr Wden - Excavation trench showing road surface



Plate 6 Blaen-lliw-uchaf - Section 1



Plate 7 Blaen-lliw-uchaf - Section 2



Plate 8 Blaen-lliw-uchaf - Section 3



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