

Perth and Kinross Archaeological Research Framework

Chapter 2. Palaeolithic and Mesolithic



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2.1 Introduction

The onset of the Holocene at around 9800 BC marks the commencement of the Mesolithic period with the earliest radiocarbon date for Mesolithic hunter-gatherer-fisher activity in Scotland currently 8630 cal BC [9250 ± 60 BP; OxA-10180] from [Cramond](#) on the Firth of Forth (Saville [2008](#)). Defining the end of the period is more complex with overlaps in radiocarbon dates for Mesolithic and Neolithic sites across Scotland (see Ashmore [2004](#)). However, for the purposes of this Framework, the transition is recognised as commencing from 4000 BC, as defined by the Scottish Archaeological Periods and Ages ([ScAPA](#)) project. The search for evidence of the hunter-gatherer communities of Perth and Kinross remains a relatively new endeavour with great promise demonstrated through investigations by the *Ben Lawers Historic Landscape project*, *Strathearn Environs and Royal Forteviot* ([SERF](#)) project and most recently the *Early Settlers* project of the Tay Landscape Partnership Scheme ([TayLP](#)). Our current understanding of this period derives from palimpsest pit sites, lithic assemblages and stray finds. The exploitation of locally sourced raw materials of the chalcedony family (chalcedony, agate, jasper and carnelian) for tool manufacture is a notable regional characteristic of the known Mesolithic. Although few in number, the known sites and assemblages have contributed significantly to our understanding of transient hunter-gatherer communities and their activities along the lowland postglacial shorelines of the Rivers Tay and Earn and in upland areas by Loch Tay. However, evidence for activity between these environments remains elusive. The projects undertaken show considerable research potential. They emphasise the value of using refined fieldwork methodologies for carefully targeted investigations as a means of increasing site identification. These projects show the importance of excavating the sites and investigating their internal organisation, as well as improving artefact recovery.

This chapter provides a regional overview for the Mesolithic in Perth and Kinross as we currently understand it. Starting chronologically with the Late Upper Palaeolithic, we consider the current absence of material evidence from this period across the region and what such activity might look like it should it be identified through future research. The overview includes a brief history of the archaeological research undertaken in the region and a more detailed assessment of the current resource. The research agenda provides recommendations for further work in the form of research priorities and

questions.

Main Periods	Sub-Periods	Date BC
Mesolithic	Late Mesolithic	8,400–4,000
Mesolithic	Early Mesolithic	9,800–8,400
Late Upper Palaeolithic	Ahrensburgian	10,800–9,800
Late Upper Palaeolithic	Federmesser-gruppen	12,000–10,800
Late Upper Palaeolithic	Hamburgian/Creswellian	12,700–12,000

Table 1. Basic chronological schema for the Late Upper Palaeolithic and Mesolithic periods of Scotland (BC). The dates are mainly based on dates from the various Scottish research framework (ScARF) panel reports ([ScARF Palaeolithic and Mesolithic section](#); [ScARF Neolithic section](#); information relating to the LUP Sonia Grimm pers. comm.).

2.2 Regional Overview

2.2.1 The Late Upper Palaeolithic

So far, no sites, assemblages or stray finds from Perth and Kinross have been dated to the LUP, but considering that certain or likely material from this period has now been reported from most other parts of Scotland, it can only be a matter of time before finds from this period are made in the area. As shown in Table 1, the LUP consists of three sub-periods, namely the *Hamburgian* (12,700–12,000 BC), the *Federmesser* period (12,000–10,800 BC) and the *Ahrensburgian* (10,800–9,800 BC). Each are defined by a set of typo-technological attributes reflected in the material culture, most importantly as different forms of arrowheads (Ballin [2017](#)). To date, the LUP in Scotland is recognised, and dated, solely on the basis of significant lithic types.



Lithics from Brownsbank Farm © HES

The Scottish *Hamburgian* is best known from [Howburn Farm](#) in South Lanarkshire (Ballin et al [2018](#)), where several thousand artefacts (probably of Doggerland flint) were recovered, including many asymmetrical Late *Hamburgian* tanged points of Havelte type (a sub-grouping). On the west coast, a *Federmesser* period site, characterised by plain-backed points, was discovered at [Kilmelfort Cave](#) near Oban (Saville and Ballin [2009](#)). Stray small *Ahrensburgian* tanged points have been recovered from the Loch Torridon and Inner Hebrides area (Ballin and Saville [2003](#)), and a site from Islay may also date to this period (Mithen et al [2015](#)). A single-edged point and several small-tanged points from Orkney indicate a LUP presence here (Ballin and Bjerck [2016](#)). Two sites from eastern Scotland are also likely to be of a Palaeolithic date; these are characterised by unusually large blades (Long Blade industries; Barton [1998](#)) which may suggest an *Ahrensburgian* date (Ballin [2019](#); [forthcoming a](#)). Sites along the Dee have yielded several probable LUP flint artefacts (Ballin and Wickham-Jones [2017](#)). There is therefore no doubt that Scotland was settled, albeit thinly and possibly not continuously, over the later part of the Palaeolithic.

The key to understanding where LUP sites may be expected lies in the subsistence economy of the Palaeolithic groups and their high mobility. Obviously, groups on the Scottish west coast and that region's islands must have exploited marine resources, and fishing is thus likely to have been part of the area's economic strategy. However, the people of this period are generally defined as being highly mobile and primarily known to have exploited the migrating herds of reindeer which they followed and hunted across the steppes of the north European Plain, across Doggerland and up into what is now the

Scottish mainland.

In order to consider the possibility of LUP sites in Perth and Kinross, it is useful to examine the known locations of LUP sites and findspots in southern and eastern Scotland. These sites are generally found in connection with rivers, such as the Tweed (Howburn Farm is located in the gap between the Tweed and the Clyde), the Dee and the Lunan. Rivers such as these are likely to have been important for many reasons: they facilitate travel and thus access into the Scottish hinterland, and are also likely to relate to the migration routes of animals such as reindeer funnelled along river valleys. Rivers and their valleys, such as the Tay, the Earn and the Isla, within the area of interest, would have provided varied resources and ecozones (for shelter etc).

With regard to site survival, identification of such early remains is problematic. In many places, LUP activity has left little archaeological footprint. There is an increasing recognition that the signature of exploratory and colonising activity expected in the LUP will be light. In addition, active geomorphological processes have served to obscure the record. In particular, the submergence of the Main Holocene Transgression has impacted on many of the lower fields along the present Tay estuary, which means that shoreline sites from the earlier Mesolithic and LUP are likely to have been disturbed and redeposited, as indicated by water-rolled lithic artefacts from lower levels along the estuary (Nicol and Ballin [2019](#); Dawson et al [2014](#)). This suggests that, in the general Tay area including its tributaries, it may be more fruitful to search for sites dating to this period further inland. For example, on raised terraces along the waterways or around the shores of lochs (Howburn Farm type sites) which were places favoured by northern German and Danish LUP reindeer hunters (eg Rust [1937](#); [1958](#); Holm and Rieck [1992](#)). Research into the latter category should consider the landscape changes as a result of agricultural drainage and other land improvement schemes from the eighteenth century onwards which have led to the disappearance of many ancient watercourses.

2.2.2 The Lowland Mesolithic

As the Tay estuary gradually cleared of retreating ice from the Late Devensian glaciation around 15,000 years ago, the emerging landscape of Perth and Kinross and its natural resources became accessible for hunter-gatherer communities. The earliest dated Mesolithic activity comes from a pit alignment

at [Wellhill](#), Dunning (MPK7184) which suggests that transient groups were successfully navigating up the River Earn into Strath Earn from the Tay estuary during the Late Mesolithic (Wright and Brophy [forthcoming](#)). Wellhill is situated around 1.5 km south of the main postglacial shoreline and sufficiently inland to indicate that early hunter-gatherer activity extended beyond coastal subsistence camps near the estuary. Although no lithic artefacts were recovered from Mesolithic contexts, radiocarbon dates of 8205 and 7525 cal BC indicate that activity was broadly contemporary with the Mesolithic pit alignments at Stonehenge, Wiltshire and [Warren Fields](#), Aberdeenshire (see Pollard [2017](#), 176 for discussion on the chronological connection between Stonehenge and Warren Fields). At around 40m above sea level, Wellhill is considerably higher than the maximum of the Main Holocene Transgression. This was a rapid rise in sea level estimated at between 9 and 12m (Dawson and Cressey [2010](#); Dawson et al [2014](#), 15) that occurred towards the end of the Mesolithic period around 5630–5440 BC (Ballantyne and Dawson [1997](#), 39). It has been suggested that it could have destroyed evidence of earlier Mesolithic activity (Dawson et al [2014](#), 18; Nicol and Ballin [2019](#), 13). Wellhill therefore demonstrates the potential for Early Mesolithic material to survive at higher elevations in non-coastal contexts which are still within close proximity of the shore. At another inland site just 4km west of Wellhill, Forteviot, carbonised material, found in Neolithic to Bronze Age and early medieval contexts, has produced four Late Mesolithic radiocarbon dates ranging from 7510 to 6680 cal BC (Brophy and Noble [2020](#), 113).



Lithic assemblage from Freeland Farm © Leeanne Whitelaw

The extensive lithic assemblage discovered at [Freeland Farm](#) (MPK20049) as well as indications of Mesolithic activity from assemblages at [Pitroddie](#) (MPK20194) and [East Inchmichael Farm](#) (MPK20193; Nicol and Ballin [2019](#), 13) offer the first detailed insights into the activities, material exploitation and lithic technology of the hunting, gathering, fishing communities that were active along the shores of the Tay estuary in the later part of the Mesolithic (8400–4000 BC). The linear spread of lithic debitage, cores and tools parallel to the southern bank of the main postglacial shoreline at Freeland Farm provides the first confirmed evidence of a coastal settlement in the region. Such a position would have provided the transient community with access to multiple biotopes, namely the water for fishing, fowling, shellfish gathering and hunting marine mammals, and the coastal hinterland for general hunting and gathering (Nicol and Ballin [2019](#), 32). Freeland Farm is notable for the wealth of information which the assemblage provides for lithic raw material procurement, core preparation and tool production activities. The evidence indicates that jasper/carnelian geodes, sourced from local igneous

rock, was the predominant material exploited for the manufacture of diagnostic Late Mesolithic tools types such as microblades, microburins and burins (Nicol and Ballin [2019](#), 30). Further east on the northern shore at Pitroddie and East Inchmichael Farm in the Carse of Gowrie, the situation is slightly different with chalcedony and agate found to be more common within the assemblages than jasper/carnelian (Nicol and Ballin [2019](#), 35).

on Arran in the Firth of Clyde, green bloodstone on Rum in the Inner Hebrides and indeed quartz in the uplands of Perth and Kinross.

Finally, a single microburin is noteworthy here for its discovery south of the Ochil hills at [Kilmagadwood](#) (MPK20304) near the shore of Loch Leven in Kinross-shire. This example was one of 34 chipped stone artefacts recovered during community fieldwalking in 2018 (Engl [2018](#)).

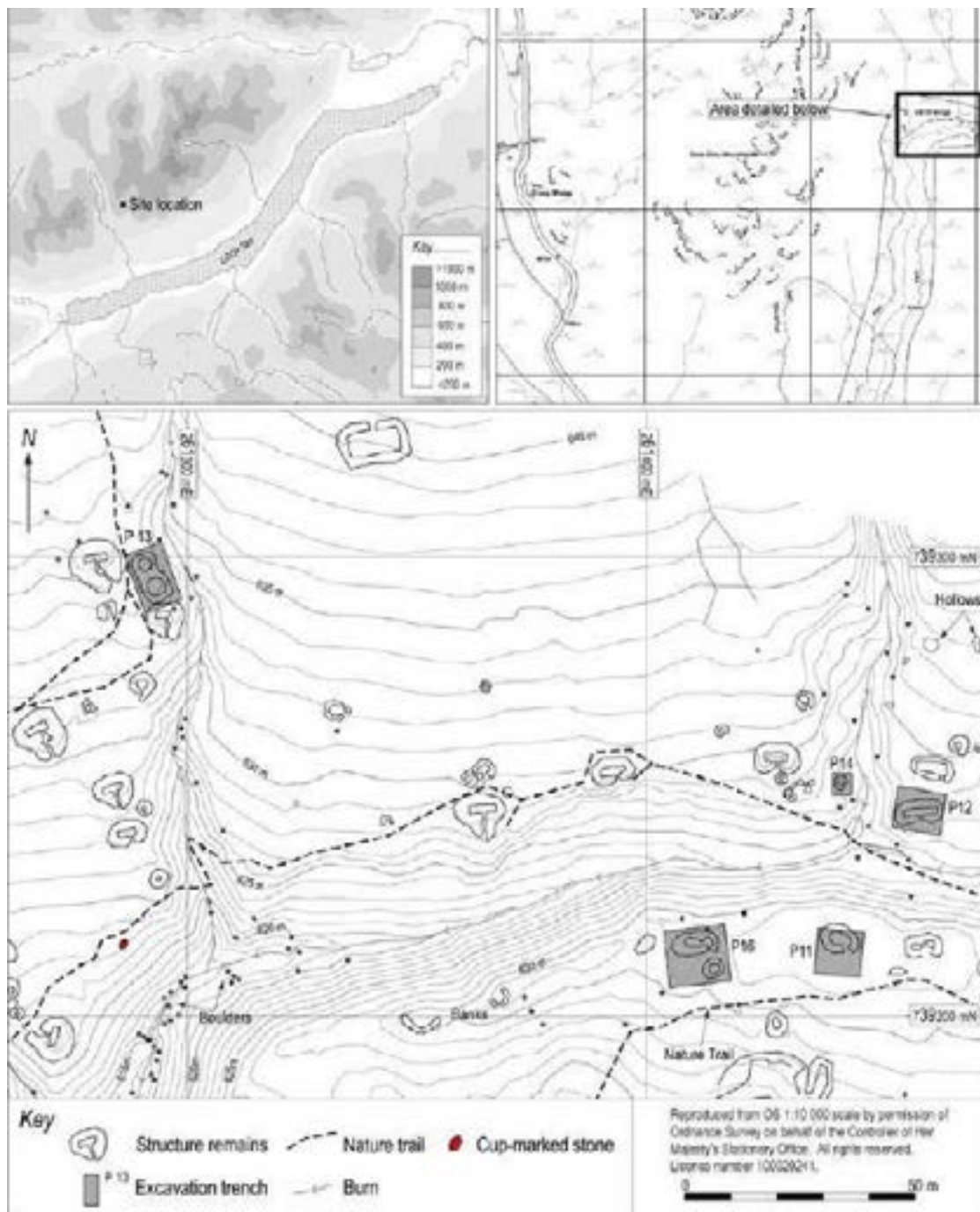


Location of Freeland Farm at the edge of postglacial shoreline (Ballin 2019) © Archaeology Reports Online

This is comparable to the Mesolithic community at [Morton](#) in the Tentsmuir area of Fife where chalcedony was used extensively alongside flint (Coles et al 1971). The exploitation of jasper/carnelian is an important regional distinction which may prove to be a very localised signature of the coastal communities along the Tay estuary and a diagnostic trait of the Mesolithic period in this area (Coles et al [1971](#)). Whether the distinction occurs for entirely pragmatic reasons such as material availability remains open for discussion, however. Nicol and Ballin ([2019](#)) suggest an appealing interpretation that the brown colouring of the jasper/carnelian had particular meaning to the communities of the Tay as a visual symbol of social identity. Just as black pitchstone may have had

2.2.3 The Upland Mesolithic

Although the main concentration of lithic assemblages has been found along the banks of the Tay estuary to date, the region's earliest known evidence of lithic reduction activities derives from the uplands. This is unusual for Scotland where the Mesolithic has traditionally been considered a coastal phenomenon owing to the rich evidence from the islands and the west coast (Finlay 2016, 27). The site at [Edramucky Burn](#) (MPK174) on the northern side of Loch Tay demonstrates that hunter-gatherers were reaching far beyond the Tay estuary and navigating the main watercourse up past primary forest-clad shores to the river's source around 7200–6700 BC.



The excavation at Edramucky Burn. The Mesolithic pit was located in P16. The possible microburin, and a retouched flint flake resembling a scalene-triangle microlith were recovered from P11 (Atkinson [2016](#), Illus 2.6)

The assemblages from Edramucky Burn indicate extensive lithic raw material procurement, preparation and tool manufacture using locally sourced quartz types, with artefacts made of coastal flint, including a possible scalene-triangle microlith. This suggests that the hunter-gatherer groups arrived with pre-made flint toolkits which they augmented using the local resources (MacGregor and

Toolis [2016](#), 16). These groups carefully selected their upland camps to ensure access to freshwater and, as demonstrated by the environmental evidence, scrub-woodland resource. The site is situated atop a prominent moraine bank around 630m above sea level with commanding views of the surrounding landscape making it an ideal hunting-stand (MacGregor and Toolis [2016](#), 16). The Edramucky Burn site also stands at the foot of an important terrestrial routeway between Loch Tay and Glen Lyon suggesting a possible further use as a transitory camp which would have taken these early settlers deeper

still into the northernmost upland glens of Perth and Kinross (Finlay [2016](#), 27). Although considered a lower quality material (although some quartzes have excellent flaking properties), the caching of quartz nodules in a pit supports the argument for intermittent or seasonal use by groups returning to favoured locations (MacGregor and Toolis [2016](#), 16). It has been suggested they could have taken on additional social meaning for the enactment of non-subsistence-orientated rituals such as initiation, seclusion, or for instruction over the course of time (Finlay [2016](#), 27).

2.2.4 The Territory of the Mesolithic Groups of Perth and Kinross

While the remit of the current document is the modern administrative area of Perth and Kinross, it should be borne in mind that prehistoric hunter-gatherer territories tended generally to be defined by topography, such as mountain ranges and, in particular, waterways. As a result, any discussion of prehistoric territories based on modern administrative boundaries will be truncated and flawed. Waterways would generally work in one of two ways, namely as a territorial border or the focus of settlement. The deep fjords of Norway tended to separate neighbouring territories (eg Bergsvik and Bruen Olsen [2003](#), Fig. 52.6), whereas the Danish fjords, which are actually lowland estuaries, were the focus of settlement, with one social group inhabiting both sides of a fjord, from the sea and well into the hinterland (Vang Petersen [1984](#), Fig. 15).

One model would see hunter-gatherer territories along the Scottish east coast defined geographically like the contemporary Danish territories, focusing on a firth or estuary and extending from the sea, along the shores of the estuary, and into the upland and highland areas touched by the river system. In this region, this would, first and foremost, be the River Tay. Two aspects of this territorial (subsistence) system have already been mentioned, namely the inner estuary and the upland/highland area further west. However, the territory would also have included the mouth of the estuary and the North Sea coast on either side. This part of the territory lies in a neighbouring, modern administrative region and therefore is not dealt with in detail here. Nonetheless it is mentioned as the sea would have represented an integral part of the territories exploited by the Perth and Kinross communities, who would have utilised the River Tay and its estuary to access additional food resources in the form of (saltwater) fish and marine mammals (eg seals and whales).

The Tentsmuir area in Fife, immediately south of the estuary's mouth, is rich in Mesolithic remains, but only one site, Morton, has been excavated (Coles et al [1971](#)). This coastal site yielded a rich lithic assemblage from the Early as well as the Late Mesolithic periods, much of it made of chalcedony. The extensive use of chalcedony may link this site to the communities living along the River Tay and estuary.

Midden remains included evidence of the exploitation of terrestrial mammals such as red deer, roe deer, aurochs and wild boar, birds – particularly guillemots and gannets, fish and marine molluscs. The fish assemblage was dominated by cod, but also included haddock, turbot, sturgeon and salmon or trout. There was an impressive variety of marine mollusc species; the most common was Baltic tellin [*macoma balthica*]. Morton also yielded a large variety of Early and Late Mesolithic tool forms, including relatively large numbers of isosceles as well as scalene triangles (Coles et al [1971](#)).

Morton A, identified by diagnostic lithic artefacts as Early Mesolithic, returned one Late Upper Palaeolithic date and several Late Mesolithic dates covering the period 8000–4200 cal BC, whereas Morton B, identified by its lithic assemblage as Late Mesolithic, has Late Mesolithic dates ranging from 5650–3790 cal BC. However, there are indications that the re-examination and re-classification of the assemblage is desirable, ideally alongside the lithic assemblages from the rest of Tentsmuir that are held in the collections of National Museums Scotland ([NMS](#)) and local museums including Perth. The number of burins (101 pieces), for example, is exceptionally high, considering that Scottish Mesolithic sites tend to include none or single-digit numbers of such pieces. Unfortunately, this task is hampered by the fact that the finds have been allocated to a number of different museums.

2.3 History of Research in Perth and Kinross

The history of Mesolithic research in the region is brief. It could be argued that chance discoveries of individual lithic artefacts or assemblages from the beginning of the 20th century form the earliest recorded investigations. However, Wright's ([2012](#)) re-examination revealed that the majority of these finds are either non-diagnostic for any prehistoric archaeological period or can be typologically categorised as of Neolithic or Bronze Age origin.

The Ben Lawers Historic Landscape project 1996–2005 (Atkinson [2016](#)), led by the Glasgow University

Archaeological Research Division (GUARD), therefore represents the first formal archaeological research project to identify Mesolithic activity in Perth and Kinross and notably also the first in Scotland from an upland context (Finlay [2016](#), 27). The [SERF](#) project (2012–17) followed with its excavations at [Forteviot](#), [Wellhill](#) and [Millhaugh](#), yielding Mesolithic dated material (Forteviot), pits (Wellhill) as well as comparable pit features (Millhaugh) on the shores of the River Earn. To date, the Tay Landscape Partnership ([TayLP](#)) *Early Settlers* project (2014–17) remains the only investigative work dedicated to identifying Mesolithic activity that has taken place in the region (Nicol and Ballin [2019](#); Ballin and Nicol [2017](#)). It was developed by Perth and Kinross Heritage Trust in response to the lack of known sites within the area (David Strachan pers comm) and during development of the *TayLP Early Settlers* fieldwalking programme, the Trust commissioned two reports on the area which in themselves represent valuable research contributions. Wright ([2012](#)) produced a comprehensive assessment of known lithic artefacts and assemblages held in museum collections that were attributed to the Mesolithic period. Dawson, Duck and Young's 'Ice Age to Modern Coastline' report ([2014](#)) combines geomorphological and stratigraphic studies with radiometric dating to provide a detailed synopsis of relative sea level changes in the broad valley lowlands of the River Earn and the firth lowlands of the River Tay since deglaciation around 14,000 years ago. Digital mapping of the main postglacial shoreline (MPGS) at its maximum inundation forms part of this work and provides a significant resource for informing regional Mesolithic research and targeting fieldwork. It is noteworthy that since the successes of *Early Settlers* along the edges of the MPGS, efforts are being made to place fieldwalking conditions on development work in this area which, if successful, will increase the opportunities for Mesolithic discoveries in the firth and broad valley lowlands in the future. The recent publication of guidance on the investigation and management of lithic scatter sites in Scotland by the Association of Local Government Archaeological Officers ([ALGAO](#)), which sets out the significance of scatters and presents technical best practice, is a welcome addition to maximising any future developer-led opportunities (Wickham-Jones [2020](#)).

2.4 The Resource

The existing record for Perth and Kinross's earliest hunter-gatherer communities, as we currently know it, remains minimal. Period assigned entries in the

Perth and Kinross Historic Environment Record currently consists of 31 sites and monuments, 26 of which relate to chance discoveries of individual lithic artefacts or small assemblages. A commissioned investigation of these lithic assemblages in 2012, including those accessioned at the NMS and Perth Museum and Art Gallery, failed to identify any as being unequivocally Mesolithic in either form or date (Wright [2012](#)).



Reconstruction of a Mesolithic settlement © Mary Kemp-Clarke

There are only four recorded sites associated with domestic or lithic working activity, one of which refers to an area of fallen trees and stumps near Craggantoul, to the south of Balnahanaid in Loch Tay. This site has remarkable preservation; it is a highly informative discovery that indicates the presence of a woodland on the edge of the loch from the 9th millennium BC to the 6th century AD when the water level was 4–5m lower than it is today (Dixon [2016](#), 10). LUP and Mesolithic settlement evidence, which includes both robust dwellings and more ephemeral shelter and windbreak structures, remains elusive across the region. Examples occur close at hand between the Tay and Forth estuaries providing evidence of both multiple structures as at [Morton](#) (Coles et al [1971](#)) and individual structures as at [Fife Ness](#) (Wickham-Jones and Dalland [1998](#)). These sites suggest that although currently absent from the known resource, there is a high likelihood that similar structures would have been present in the Perth and Kinross area and that archaeological evidence of them remains to be found.

2.4.1 Pits

At the time of writing current ongoing research across Scotland has identified 166 radiocarbon dates from 48 Mesolithic sites (Wright and Brophy [forthcoming](#)). These pits can be categorised as:

1. Pit alignments;
2. Dwelling structures with associated pits where lithics and carbonised assemblages have been recovered;
3. Pit(s) with recovered lithics and carbonised material; and
4. Pit(s) with carbonised assemblage.

The only known radiocarbon dates from pits in Perth and Kinross are from [Edramucky Burn](#), Ben Lawers (category 3), and [Wellhill](#), Dunning (category 1). A radiocarbon date of 7200–6700 cal BC (8045 ± 55 BP; OX-A-9867) was obtained from willow charcoal recovered from a single pit at Edramucky Burn. It also included an assemblage of quartz flakes, nodules and small fraction debitage interpreted as material from a seasonal camp that was buried as a cache intended for use on a return visit but never recovered (Atkinson [2016](#), 15; Donnelly [2016](#), 15; Finlay [2016](#)).

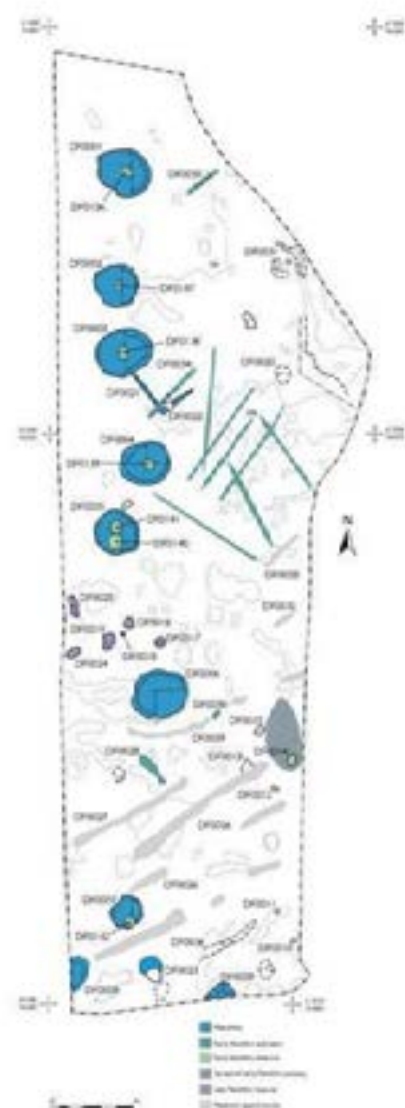


Three of the ‘halo’ pits at Wellhill © University of Glasgow



Aerial photograph of the scheduled pit alignment at Wellhill © HES

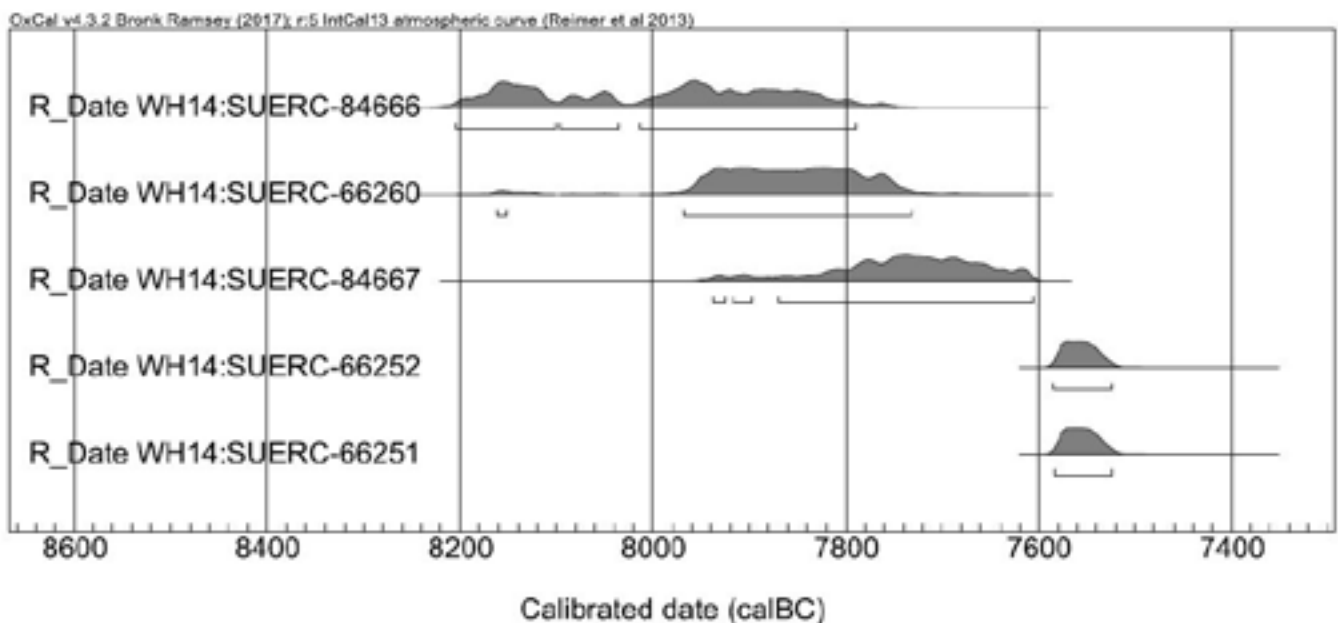
The SERF-excavated alignment of ten pits at Wellhill, Dunning [8205–7525 cal BC] was distinctive in plan due to their outer ring appearance and defined as ‘halo’ pits. An L-shaped ditch was also recorded which may have been from a weak, self-supporting windbreak.



Post-excavation plan of trench WH14.1 from Wellhill © University of Glasgow

A similar ‘halo’ pit was excavated by SERF at the scheduled multi-period site at [Millhaugh](#), Dunning (MPK2015); however, no Mesolithic dating evidence was obtained. A residual backed bladelet of flint, recovered from a late Neolithic post/posthole, has been suggested as indicating a possible Mesolithic presence (Wright and Brophy [forthcoming](#)). All the same, it should be noted that backed bladelets are not as strictly Mesolithic as geometric microliths like isosceles and scalene triangles, trapezoids and crescents.

of Early Mesolithic pit configurations at both regional and national levels.



OxCal v4.3.2 multi-plot of radiocarbon dates from Wellhill (Bronk Ramsey 2017)

Non-functional interpretations are a consideration for this site class on account of the lack of lithic artefacts—none from Wellhill and only five discovered at Warren Fields on the River Dee, Aberdeenshire (Pollard [2017](#), 176–7). Indeed, Murray and colleagues ([2009](#)) have argued that Warren Fields had a ceremonial function due to the astronomical alignment of the pits which may mimic the phases of the Moon (Gaffney et al [2013](#)). However, pragmatic explanations also exist for pit configurations; both the site at [Milltimber](#), also on the River Dee, and that at [Blackdog](#), on the Aberdeenshire coast, are interpreted as hunting traps (Dingwall et al [2019](#), 121–31; van Wessel and Wilson [2019](#), 309). Few pit alignments in Britain and Ireland were radiocarbon dated to the Mesolithic prior to the discovery of Warren Fields and Wellhill (Bayliss et al [1997](#); Cleal et al [1995](#); Pollard [2017](#)). Regardless of a subsistence or non-subsistence-orientated interpretation, the evidence from Perth and Kinross therefore represents a valuable contribution to understanding the form and function

2.4.2 Palimpsests

Currently all of the sites discussed ([Wellhill](#), [Edramucky Burn](#), [Freeland Farm](#), [Pitroddie](#), [East Inchmichael Farm](#) and [Millhaugh](#)) that have either a confirmed Mesolithic date or contain assemblages confidently attributed to Mesolithic activity have been found in close association to overlying Neolithic material. The presence of diagnostically Neolithic lithic assemblages, artefacts and domestic features indicates the continued importance and relevance of both the camp sites and non-subsistence locations for later communities as they became more sedentary. As such, they provide a valuable resource for understanding the transitional changes in technologies and lifeways between these two periods.

2.4.3 Material Culture

Lithic assemblages are a significant archaeological resource and represent a core source of information for understanding Scotland’s earliest settlers (Wickham-Jones [2020](#), 10). Scatters, which can often be the only indication of past human activity, provide evidence for more complex depositional practices and include material from different periods. It is key to understanding how a site has been used over time (Wickham-Jones [2020](#), 10). Lithic scatters are the dominant form of material culture available from the Mesolithic period in Perth and Kinross and represent the primary evidence for hunting, gathering, fishing and transitory camps in both the lowlands and uplands. In the uplands at [Edramucky Burn](#), local quartz dominates the assemblages with five main types exploited. The largest singular assemblage, some 988 pieces, came from an occupation floor interpreted as a primary knapping location and near a pit containing a cache of quartz nodules. Blades, cores and flakes comprise the bulk of the assemblages but none, other than one possible microlith fragment, were diagnostic (Wickham-Jones [2020](#), 13 and 15). The recovered flint was of a wide range of colours, and evidenced the importation of pre-made tools to the site with subsequent retooling episodes. The finds included a possible microburin, a retouched flake resembling a scalene-triangle microlith and a backed bladelet (Wickham-Jones [2020](#)).

The multi-period assemblage from [Freeland Farm](#) (707 lithic artefacts) is dominated by Late Mesolithic evidence (8400–4000 BC), in particular the exploitation of local jasper/carnelian for the production of microblades and tools. The tools include microliths and bladelets, scrapers, knives, burins and truncations; a diagnostic microburin by-product from the manufacture of microliths was also recovered.



Burins © Lithic Research



Backed knife © Lithic Research



Lithics with evidence of edge retouching © Lithic Research



Flint Scraper © Lithic Research



Carnelian scrapers © Lithic Research



Cores © Lithic Research



Assemblage of microblades © Lithic Research

Considering the transition to a more sedentary use of the site, local flint characterised the Early Neolithic material recovered from Freeland Farm and late Neolithic artefacts included exotic flint from north-east England (Nicol and Ballin [2019](#)). Neolithic forms include a leaf-shaped point, scale-flaked knives and a truncated blade of Arran pitchstone. As shown in Ballin ([2015](#); [2017](#)), most Scottish mainland pitchstone found in radiocarbon-dated pits belongs to the Early Neolithic, although a small number of pieces have now been recovered from radiocarbon-dated Mesolithic pits (Ballin et al [2018](#)).

Assemblages from the northern shore of the River Tay estuary at [Pitroddie](#) and [East Inchmichael Farm](#) continued to exhibit the exploitation of jasper/carnelian in the form of flake debitage. However, the dominant materials, found in the form of debitage and short end-scrapers, were chalcedony and agate. (Ballin et al [2018](#), 13). A further, very small assemblage from the Scone Estate (MPK20192) included a pitchstone conical microblade-core that most likely dates to the Early Neolithic (Ballin et al [2018](#)).

The extensive assemblage from Freeland Farm has allowed the development of a Late Mesolithic operational schema that covers procurement, core preparation, blank production and tool production (Ballin et al [2018](#), 30–1). It represents a significant step forward in understanding hunter-gather lithic technology and manufacture in the region. Based on the assemblage, Nicol and Ballin ([2019](#)) suggest that the schema focused on the production of microblades and narrow broadblades by the application of soft-hammer percussion, most likely pressure-flaking. The application of bipolar technique appears infrequently; it is argued that the flawed nature of jasper/carnelian made soft-hammer percussion more successful for the production of single- and opposed-platform cores as well as the blades/microblade. Such variations to reduction strategies in response to the size and quality of available raw materials is seen across Scotland (Finlay et al [2002](#), 108). However, it seems that bipolar technique was less frequently used in eastern Scotland compared with western Scotland, such as at [West Challoch](#). This is possibly because the flint pebbles generally available in western Scotland are smaller than those found along the Scottish east coast (Ballin [forthcoming b](#)).

In many respects, from procurement through to production, the use of jasper/carnelian appears to have created a notable local Mesolithic signature that is regionally distinct from contemporary sites

on the east and west coasts of Scotland where flint exploitation is more dominant. Although parallels can be found on the west coast where flint was locally supplemented by visually distinct raw materials including pitchstone, bloodstone and baked mudstone, at the time of writing the use of jasper/carnelian remains specific to the River Tay communities.

2.5 Research Recommendations

This section presents the agenda themes for the Late Upper Palaeolithic and Mesolithic in Perth and Kinross. Some are nested under the **overarching PKARF theme headings** aimed at addressing wider multi-period priorities and others are **period-based** and specific to the scope of this chapter. Where appropriate, a short explanatory note is provided detailing underlying **period-based** thematic priorities which is then followed by the research questions generated to address them.

Environment

The Mesolithic environment of Perth and Kinross can only be described in general terms and is poorly understood because of the relative paucity of pollen cores and related palaeoenvironmental research. Dawson et al's 'Ice Age to Modern' report ([2014](#)) provides a valuable synthesis of the data relating to sea level change in the Tay estuary as well as signposting to other relevant works such as Whittington et al's ([1991](#)) core sample studies at [Black Loch](#) near the Grange of Lindores, Fife. Likewise, Dixon's ([2016](#), 12) work in Loch Tay and Miller and Ramsay's ([2016](#), 15) analysis of environmental samples from the lower slopes of Ben Lawers offer much needed data for reconstructing the upland Mesolithic environment. The Late Mesolithic radiocarbon dates amongst the wide range of dates from the submerged tree remains at [Craggantoul](#), Loch Tay (Dixon [2007](#)) are a reminder of the potential of such sites in Perth and Kinross for developing long native tree-ring chronologies. Such a chronology has been established for native Scots pine (*Pinus sylvestris*) elsewhere in the Scottish Highlands; this enables the reconstruction of past climates, woodland characterisation and dating applications. (Wilson et al [2011](#)). The [SERF](#) project excavations around Dunning have provided additional environmental data; however, their surveys failed to find suitable water-logged locations for taking contiguous pollen core samples with sufficient depth needed to obtain data to characterise the Mesolithic environment. The surveys extended into the Ochils beyond the three parishes of the SERF project area but due to the rich, well-draining agricultural soils of Strathearn were unsuccessful in identifying suitable pollen core sites.

PKARF Agenda 2.1: Understanding when and how deglaciation took place is key to determining and identifying new Mesolithic sites.

PKARF Agenda 2.2: The collection of environmental data for the immediate postglacial periods continues

to be a high priority for reconstructing the Mesolithic landscape of the region, and therefore informing our understanding of how early settlers navigated, exploited and influenced it.

PKARF Agenda 2.3: Reconstructing ancient watercourses across the region is important for understanding how early settlers navigated, exploited and influenced the landscape.

PKARF Qu 2.1: How and when did glaciation take place across Perth and Kinross?

PKARF Qu 2.2: What did the palaeoenvironmental of the region (including shoreline and inland vegetation) look like?

PKARF Qu 2.3: What were the ancient courses and levels of the region's rivers before and after the Main Holocene Transgression/at various stages of the LUP and Mesolithic periods?

PKARF Qu 2.4: What potential is there to develop prehistoric tree-ring chronologies in Perth and Kinross for archaeological dating, climate record and other environmental applications?

Upland and Lowland Relationships

No evidence of settlement structures has yet been identified in Perth and Kinross. However, Mesolithic dwellings have been found nearby along the Fife coast at Morton and Fife Ness, which demonstrates the potential for similar structures to have existed in the region. Efforts should focus on their discovery in both upland and lowland contexts.

PKARF Agenda 2.4: Efforts should focus on the discovery of Mesolithic dwellings and settlement structures in the Perth and Kinross region.

PKARF Qu 2.5: How can we use the discoveries at Edramucky Burn and Freeland Farm to find new discoveries and help target future investigations to identify settlement activity in both the uplands and lowlands?

PKARF Qu 2.6: How can the potential of lithic scatter sites be realised to assist with the identification of settlement?

PKARF Qu 2.7: How do new site discoveries relate to existing Mesolithic settlement patterns from elsewhere in terms of features, site morphology, material culture and location within the landscape?

PKARF Qu 2.8: How can our understanding of the small Fife Ness type structures and the larger

Howick type structures inform the identification and interpretation of settlement activity in Perth and Kinross?

Periods of Transition

All of our currently known Mesolithic sites include later prehistoric activity. Understanding the relationships between periods of activity on these sites is a priority for appreciating the importance of places to people across chronological time spans.

PKARF Agenda 2.5: There is a need to better understand the relationships between Mesolithic and Early Neolithic sites.

PKARF Agenda 2.6: How can the dissection by excavation of apparent palimpsest sites into non-chronologically mixed zones improve our understanding of site biographies?

PKARF Qu 2.10: To what extent can Early Neolithic sites assist with identifying Mesolithic activity in the region?

PKARF Qu 2.11: To what extent is Mesolithic material incorporated into later sites?

PKARF Qu 2.13: What are the relationships between pits/pit alignments and dwellings and lithic scatters?

Pits and Pit Alignments

Examples of pits and pit alignment sites remain sparse across the region, identifying more of these and understanding how they functioned whether for subsistence, non-subsistence or a combination of both purposes is of importance.

PKARF Agenda 2.7: Identification of more pits/pit alignments in the region is needed.

PKARF Agenda 2.8: How can examples of pits and pit alignments found outside Perth and Kinross better inform site identification and interpretation within the region?

PKARF Agenda 2.9: Use knowledge from recent examples found outwith Perth and Kinross to better inform identification of pits and pit alignments and improve interpretation within the region?

PKARF Qu 2.12: Is there a distinctive signature or characteristic of Mesolithic pits and alignments, such as the Wellhill 'halo' that could be used as a diagnostic for further site identification?

PKARF Qu 2.13: What are the relationships between pits/pit alignments and dwellings and lithic scatters?

PKARF Qu 2.14: What were the functions of pits and pit alignments?

Material Culture: Lithic Assemblages

The successes of fieldwalking projects such as the TayLP *Early Settlers* within the region and *Mesolithic Deeside* in Aberdeenshire (see Wickham-Jones et al [2021](#)) evidence the value and great potential of conducting systemic and targeted fieldwalking supported by detailed analysis. More work of this nature needs to be carried out through applied best practice, as recently set-out in [Guidance for Investigating and Managing Lithic Scatter Sites in Scotland](#) (Wickham-Jones [2020](#)).

PKARF Agenda 2.10: How can the application of best practice and detailed analysis aid in the discovery of other lithic scatter sites?

PKARF Qu 2.15: Where are the region's other lithic scatter sites?

PKARF Qu 2.16: What do new lithic assemblages reveal about the range of subsistence activities undertaken by Mesolithic people in Perth and Kinross?

PKARF Qu 2.17: How do new lithic assemblages from Perth and Kinross relate to previously examined lithic assemblages?

PKARF Qu 2.18: How do subsistence activities of Mesolithic groups in Perth and Kinross relate to evidence found elsewhere in Scotland and more broadly in the UK and Europe?

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