



Guidance for Investigating and Managing Lithic Scatter Sites in Scotland

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Summary

This guidance sets out to discuss suitable investigation techniques for lithic scatter sites, and to present a management strategy that makes the most of this valuable archaeological resource. The guidance is divided into two parts to address firstly our understanding of these site types, and secondly how to manage them.

To successfully achieve sustainable management of lithic scatters a proactive programme of investigation and monitoring is required, to be implemented wherever scatter sites lie within the remit of new development and, where possible, when new sites are found, or existing sites considered. Initially this requires basic background information relating to the formation and current state of the resource to be provided. The document does not seek to reassess known lithic scatter sites across Scotland, discuss the history of collecting, or provide detailed academic discussion of research on lithic scatters.



Cover Image: Test pitting the lithic scatter at Nethermills Farm Site NM4, Aberdeenshire, February 2019

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Part 1

1 Introduction

1.1 Definition of a Lithic Scatter

1.1.1 Scatter sites are archaeological sites that comprise collections of archaeological artefacts on the surface of the ground in an area devoid of other upstanding archaeological features. They may comprise various types of artefact: pottery; stone tools; etc. This report is concerned with scatters of flaked stone, henceforth referred to as 'lithic scatters'.



Figure 1 (Left): The lithic scatter at the Sands of Forvie, Aberdeenshire. (Right): A close-up of the scatter showing some of the stone flakes that may be seen on the ground surface.

1.1.2 In general, lithic scatter sites do not incorporate archaeological features (e.g. pits; mounds; etc.) on the ground surface, though other upstanding sites (such as barrows or earthworks) may lie in close proximity to the site. It is also the case that the material to be observed on the surface of the scatter site is only a portion (usually estimated to be between 2% and 5%, Billington 2016) of the site assemblage: most of the lithics will remain below the surface in the ploughzone or other disturbed material. Below this, many, but not all, scatter sites include surviving archaeological features, such as pits

and post-holes, which will contain *in situ* artefacts. The surface scatter is always just the tip of the archaeological material, whether it survives in the ploughzone or below, and any work on a scatter site should be aware of this.

1.1.3 It is worth noting that while lithic scatter sites most commonly contain artefacts made of flint, many other stones may also be represented. Quartz, chert, rhyolite, carnelian, tuff, bloodstone, and a range of other stone types were all made use of in prehistory and have been found on lithic scatter sites. *In situ* deposits of flint in a primary Cretaceous geological context are lacking in Scotland, so the predominant contents of a lithic scatter site will often reflect a diverse local geology. Quartz tools are particularly common in the north and west, chert is more common in the Borders, while an assemblage of Carnelian has been reported from Perth and Kinross. The word 'lithics' is used here as shorthand for the range of stone artefacts of different materials.

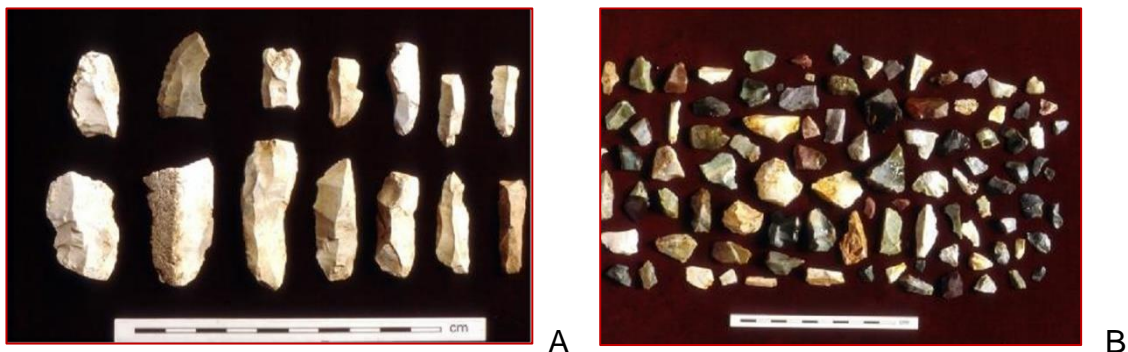


Figure 2: Stone tools (lithics) from the lithic scatter site at Kinloch, Rum, which was excavated in the 1980s. Most stone tools are made of flint (A), but a range of other materials were used around Scotland, such as quartz and bloodstone (B).

1.2 Size of Lithic Scatters

1.2.1 Scatter sites may be large, or they may be small. Some contain high densities of lithics per metre square, others might have only a few pieces across a whole field. Given the likelihood that the surface finds indicate archaeological material below, even a small scatter has to be regarded as potentially significant. It is important to devise techniques of investigation and management that take the whole site into account.

1.3 Significance

1.3.1 The significance of a lithic scatter site depends on the rarity (or otherwise) of similar sites in the vicinity, plus the type and amount of lithics present. In short:

$$\text{Rarity} + \text{Evidence} = \text{Value}$$

1.3.2 Lithic Scatters occur across Scotland and are often the first indication of archaeological material in a location. Stone tools, and the debris from their manufacture (knapping), provide important evidence of human activity in the past including information on periods of occupation, domestic tasks, hunting practices, mobility, and raw material collection. Scatter sites often provide evidence for prehistoric activity in areas where no upstanding remains survive. In many cases, they signal the existence of a site that has been partially destroyed, or where surviving features are buried below the surface of the ground. In other cases, they represent sites relating to periods where lasting upstanding features would not have been created.



Figure 3: The Mesolithic site at Nethermills Farm, Aberdeenshire. This site was first discovered in the 1970s, when a local antiquarian recognised the nature of the stone tools on the surface of the plough soil. Excavation in the 1980s revealed the existence of prehistoric remains dating back as far as the sixth millennium BC.

- 1.3.3 Scatter sites are of particular significance for the earliest periods of human settlement in Scotland. The archaeological record of Palaeolithic and Mesolithic Scotland is particularly ephemeral and upstanding features rarely survive. Scatter sites usually provide the sole indication of past activity at this time. For this reason, one or two Palaeolithic lithics are always of high significance. Mesolithic sites are often (but not always) characterised by high densities of stone artefacts. Though only a small proportion of pieces might be tools per se, the comparative rarity of Mesolithic sites also means that any Mesolithic scatter is likely to be of high significance.
- 1.3.4 Scatter sites can also provide important evidence relating to more complex deposition practices in any period. While *in-situ* pits and their contents may be preserved in sub-surface features, the topsoil is likely to include material from other practices such as that from middens (waste deposits) or house-structures. The relationship between the scatter and subsurface assemblages can be complex and is always of use to tease out critical detail regarding the interpretation of human activity at the site.
- 1.3.5 Many lithic scatters include artefacts from several periods of occupation. As such they provide important evidence for the recurring significance of a location over time. Analysis of the assemblage helps to shed light on separate activities at different periods of time.
- 1.3.6 The importance of lithic scatter sites has been recognised since the earliest days of archaeology in Scotland. Papers on collections of stone tools from field surfaces are to be found in the earliest volumes of the *Proceedings of the Society of Antiquaries of Scotland*, going back to the 1870s, and Scottish museums contain many scatter collections made by professional and nonprofessional alike. Lithic scatter sites comprise a key archaeological resource.

1.4 Lack of Understanding

- 1.4.1 In the past lithic scatter sites in Scotland were usually regarded as an indication of a site that has been destroyed. Without investigation it is, however, impossible to

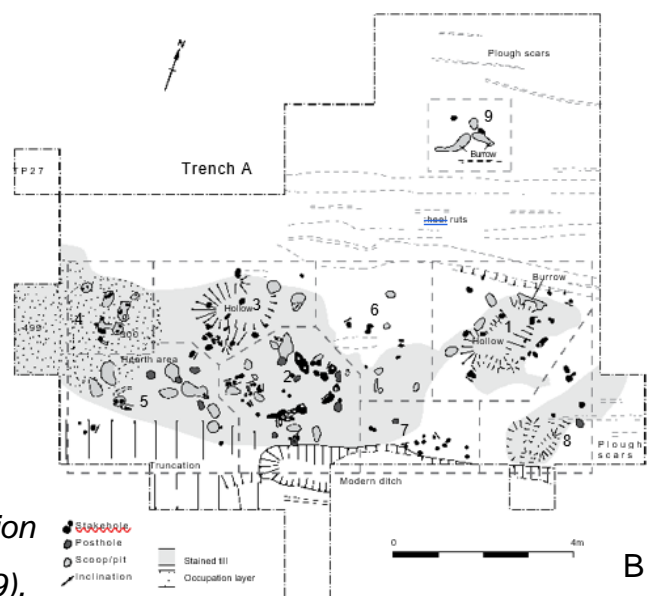
determine the extent of destruction or potential for archaeological survival. Scatter sites elsewhere are often regarded as a resource worthy of analysis and investigation, and many provide a positive contribution to archaeological understanding. Nevertheless, in Scotland, scatter sites are rarely included into mainstream archaeological studies. Despite their ubiquity, there is no overarching archaeological strategy as to the best ways in which to investigate a scatter site. While some careful considerations of lithic scatter sites do exist (often, but not always, dating to the early years of the twentieth century), few publications today analyse lithic scatters in detail and thus a useful archaeological resource is lost.

Perceived destruction + lack of information = lack of protection

1.4.2 Archaeological policy and fieldwork in Scotland focus on the protection and investigation of upstanding remains. Because of the presumption that a scatter site represents a high level of destruction, scatter sites are rarely managed proactively, and they have, to date, not been included in formal protection schemes such as scheduling. Yet, all archaeological sites result from the action of destructive processes on the human record; taphonomic processes turn anthropogenic remains into archaeological remains (stratified archaeology). While it is true that a scatter site is the result of continued disturbance to stratified archaeology, it is possible for considerable material, including *in situ* archaeological features to survive. For this reason, protection and management measures relevant to scatter site archaeology are necessary and they should always be investigated.



A



B

Figure 4: Links House, Stronsay. The unprepossessing nature of the field surface here (A) belied the complexity of the archaeological remains retrieved by excavation (B) (Woodward 2008; Lee & Woodward 2009).

2 The Resource

2.1 Formation of Lithic Scatters

2.1.1 A lithic scatter site is formed when an archaeological site is subject to disturbance sufficient to destroy the original context of the finds so that they move into the generalised sediment matrix surrounding the site. This matrix usually comprises soil, in particular plough soil, but it may also comprise other materials such as sands or gravels. Once within this matrix, items of flaked stone will move both vertically and horizontally, and some will appear on the surface of the ground. Movement within the soil is an ongoing process that results in further material appearing on the ground surface, even after it has been picked clean by collectors. Some original archaeological features, such as pits and post holes – both complete and truncated, may survive within the subsoil below the lithic scatter.

2.1.2 The destructive processes that lead to the present condition of a lithic scatter site include both natural and humanly generated practices. Worm action, burrowing animals, water movement through the soil, wind, and other erosive processes can all result in disturbance to the integrity of archaeological layers. While much human activity results in the destruction of archaeological sites, it is agriculture that is predominantly responsible for the disturbance that initiates lithic scatter sites. Agriculture can operate at many scales from small-scale subsistence farming to large-scale forestry cultivation. In practice, the formation of a single site is usually due to a combination of processes; recent investigation at Nethermills in Aberdeenshire uncovered the traces of both modern and medieval ploughing as well as burrows from at least two animal species (Wickham-Jones et al. 2017). The long history of farming in the UK means that many sites have been subject to the cumulative impact of a complex history of cultivation activities, though the developed technologies of the twenty-first century, such as heavier and deeper ploughs or multipurpose machinery to harrow and clear stones, have often penetrated deeply below the depths reached by earlier regimes. Agriculture can also extend to less-agrarian areas where industries such as forestry, biofuels, or the planting of deep-rooted grasses for conservation also contribute to the disturbance

of archaeological stratigraphies. As the windows these present for the examination of surface scatter sites are very different, investigation strategies must be flexible.



Figure 5: Forestry furrows can be a productive place to investigate lithic scatter sites. The image shows the ploughing at Coom Rig, Daer Valley, South Lanarkshire, where the Biggar Archaeology Group have recorded many lithic sites (Ward 2017).

2.2 Location

2.2.1 Lithic scatter sites occur in both uplands and lowlands, and along the coast as well as in the interior of the country. The majority of lithic scatter sites in Scotland have been found on cultivated land. In these areas they are, however, only visible in fields that have been recently ploughed or disturbed in some way. The growth of grass or turf obscures the ground surface and hides most flaked stone. Scatter spreads are also common in areas subject to broad sweeps of erosion, such as deflated sand dunes or the gravels of a loch or reservoir where the water level has recently dropped. Smaller areas of disturbance or erosion patches may reveal lithics indicative of a larger scatter, for example along footpaths, at the edge of ditches, or in the upturned ridges of forestry

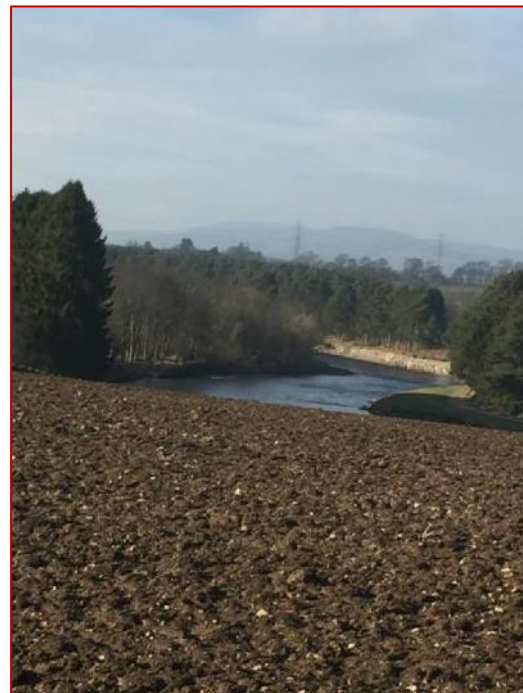


Figure 6: Typical field scatter site at Nether Balfour, on the south side of the River Dee, Aberdeenshire.

cultivation (where an 'inverse' imprint of the ground surface is often encountered). Lithics may also be observed on land immediately after harvesting; from forestry felling to the grain harvest, any activity that disturbs the land surface may reveal a scatter site. Even in pasture, the small-scale impacts of molehills or sheep scrapes can provide useful information.

2.3 Scale of Scatters

2.3.1 The literature gives the impression that lithic scatters are dense and cover a large area, but this is not always the case. A scatter represents only the surface manifestation of the body of material which lies below the ground surface. The amount of material in a scatter is related both to the size of the original archaeological site, and to factors such as the depth and frequency of ploughing or other disturbance activities. It is possible to remove most of the visible lithic artefacts from a ploughed field, only to find that more pieces have appeared on the surface a few months later. It is therefore difficult to give precise limitations regarding scatter size. Single finds or a few flints across a field might be regarded as 'background noise', but investigation is necessary to ensure that they do not indicate the existence of a larger archaeological site, mainly undisturbed, preserved below the ground surface. Where flaked stone is found it is advisable to regard it as indicative of potential archaeology no matter how few pieces there are. Given the continuum of past human activity across the landscape, the thinner spreads of archaeological material that connect larger, denser sites hold valuable information for our understanding of prehistoric communication in any area. Smaller-scale scatter sites can be significant.

2.4 Boundaries and Features

2.4.1 Given that lithic scatter sites are manifestations of below-ground archaeology, it is difficult to correlate the edges of the surface scatter with the boundaries of the site. Many scatters correspond with stratified archaeology in the form of features (pits, post-holes hearths etc.), surviving in the subsoil below the surface, but the spatial relationship between preserved features and the surface scatter varies from site to

site. Excavation may reveal that features survive directly below the densest areas of lithics, but this is not always the case. Research indicates that lithics within the plough soil do not usually move great horizontal distances on level ground, and it can be possible to discern ‘ghost features’ indicated by accumulations of stone tools within the plough soil. On some sites, however, features have been found to survive away from the main concentrations of lithics. In areas of fluvial action, or sloping topography, it is also possible for lithic artefacts to have moved away from the original archaeological remains. Investigation of the geomorphological history of the location and accumulation of surface sediments, together with spatial analysis of the finds, is necessary to understand the formation and present structure of any site. The boundary of any lithic scatter cannot be assumed to coincide with the boundary of the original archaeological site, and it is always necessary to explore outwith the area of the scatter in order to check whether archaeological remains exist across a wider area.

2.5 Visibility and Discovery

2.5.1 While some lithic scatters are clearly visible as concentrations of stone flakes spread across a ploughed field, or over the surface of a blowout in sand dunes, others are more difficult to recognise. Scatters have been found where two or three pieces of flint were picked up beside a rough path, others recognised within a sheep scrape or in the upcast from molehills in pasture. It is not always easy to find a lithic scatter site. As they do not include upstanding features, detection will always require close observation of the ground surface.



Figure 7: Examining a newly found lithic scatter on the banks of the headwaters of the River Dee. The scatter was first recognised during maintenance on the Chest of Dee footpath to the left.

2.5.2 To date, most lithic scatter sites have been discovered by chance. When farming methods, and other activities, involved closer evaluation of the ground, scatter sites were often discovered as people walked the fields and observed the soil. This is less frequent today, but many scatter sites are still revealed by those who frequent the countryside for recreation and other purposes. In recent years, the rise of community groups who devote time to systematic searches for archaeological finds across farmland and elsewhere, has led to an increase in the number of lithic scatter sites and an improvement in the information gathered about them.

2.5.3 Lithic scatters can be hard to locate in development work, especially where evaluation focusses on desktop survey and walkovers in search of upstanding remains. As noted above scatter sites are usually invisible without some ground disturbance and they are always more easily found after weathering such as frost, rain, or snowmelt. Scatters within grass, or other surface vegetation, may only be revealed by test pitting, but this can be misleading. Several scatters, comprising over 11,000 pieces in total, were excavated at Milltimber in Aberdeenshire during recent work on the Aberdeen Western Peripheral Route. These included a rare Late Upper Palaeolithic assemblage, but it is worth noting that the main finds were not predicted by trial trenching (Dingwall et al. 2019, 20).

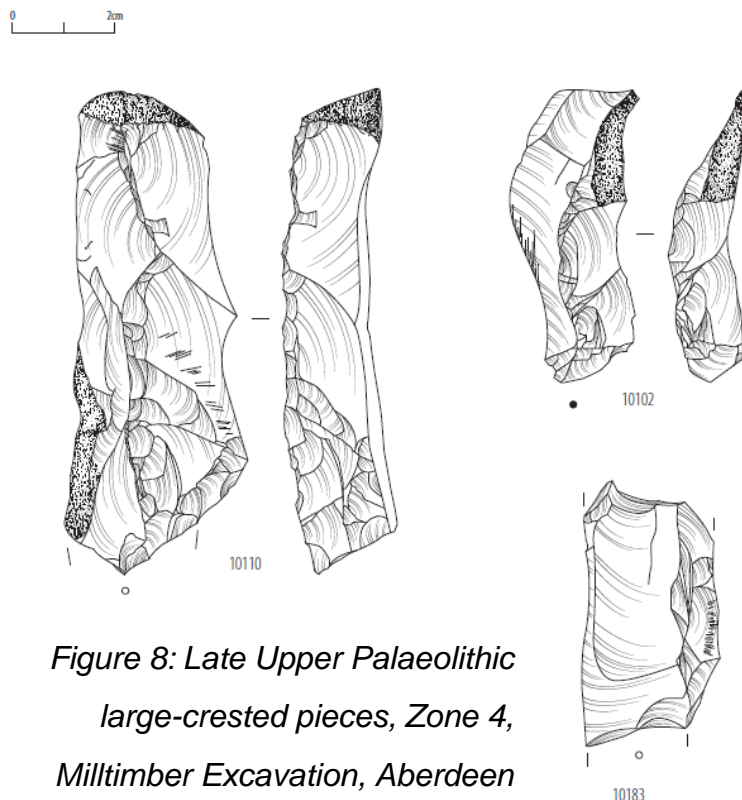


Figure 8: Late Upper Palaeolithic large-crested pieces, Zone 4, Milltimber Excavation, Aberdeen

2.5.4 While Scatter sites may occur late in the development process, it is important to evaluate them thoroughly using at least the basic assessment techniques set out below (section 8.1). This is especially important with regard to the rarer earlier sites, such as Late Upper Palaeolithic, which may comprise only a small number of artefacts over a small area and thus be easily missed. The archaeological investigation along the Aberdeen Western Peripheral Route illustrates the rewards of this approach.

2.6 Vulnerabilities

2.6.1 The very processes that lead to the formation of a lithic scatter site (2.1), also contribute to its depletion. In some cases, as with regular cereal cropping, this will be a gradual process of attrition over decades. In other cases, as with the full cycle of forestry work or the construction of a ring road, a single event can equate with complete destruction. Once a site has been planted and harvested for trees, or prepared for construction, it becomes archaeologically worthless. Vulnerabilities may include natural processes such as coastal erosion or pressure from animals. Successful management requires assessment of the nature of the threat as well as investigation of the site.

2.6.2 In recent years, the increased mechanisation of many practices has increased their destructive potential. Agricultural equipment, for example, now allows for the separation of stones and their deposition below a finer tilth. There are machines that will plough, harrow and seed in one operation, thus removing an important window for an archaeological investigation of the field surface. In general, machine operators are further removed from the surface of the ground they work. Lithic scatters, and the locations where they may be investigated, should be regarded as a diminishing resource.



Figure 9: The surface of this field was ploughed for stone separation two years previously. Note how the rows of stones are still visible.

3 Scottish Overview

3.1 Locations and Discovery

- 3.1.1 Lithic scatter sites occur across Scotland. Most have been recorded in agricultural land. Many sites occur along the fertile lands bordering major rivers, such as the River Dee (e.g. Nethermills Farm, East Park), the Tweed (e.g. Dryburgh Mains; Rink Farm), the Clyde (e.g. Weston Farm; Daer Reservoir), and the Tay (e.g. Broughty Ferry). Scatters may also occur further from the rivers (as at Morton south of the Tay) and along fossil coastlines and ancient riverbanks or loch shores. It is important to remember that the cultivated nature of the land today is a product of drainage and improvement. The world of prehistoric Scotland was very different and, though better drained land was undoubtedly preferred for occupation, it is not possible to understand the landcover of prehistory without specialised research.
- 3.1.2 Scatters exist along coastal farmlands as well (e.g. Kinloch, Rum), and they are also a common feature of sand dune systems where they may be found within erosion features such as the sandy blowouts between dunes or at the coastal edge. Scatters in these locations are very vulnerable to further erosion. Notable dune sites include the scatters at Luce Sands (Dumfries and Galloway), Sands of Forvie (Aberdeenshire), and Culbin Sands (Moray), while the scatters at Staffin (Skye) and Archerfield (East Lothian) occupy eroding coastal edges.
- 3.1.3 While the majority of lithic scatters occur in the lowlands, upland sites do exist, e.g. Howburn (Lanarkshire) or Chest of Dee (Aberdeenshire), and the predominance of lowland sites is likely to reflect the generally lower position of agricultural land as well as the relative ease of archaeological prospection in lower terrain. The Howburn site was discovered due to farm ploughing, though other sites in the area have been revealed during forestry activities (Figure 11). The site at Chest of Dee was noted during footpath maintenance (Figure 7).

Figure 10: The edge of the now forested dune system, with numerous lithic scatters, at Culbin Sands, Moray

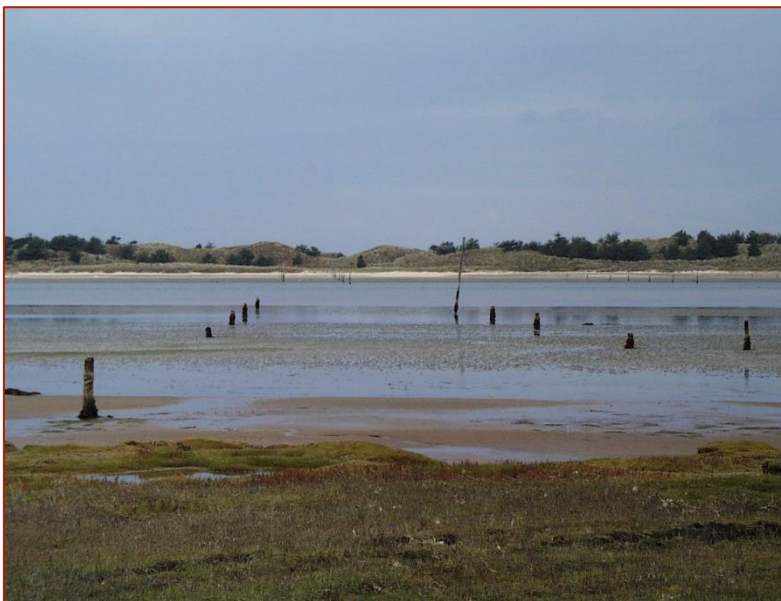


Figure 11: The lithic scatter site at Howburn, Lanarkshire



Figure 12: The surface of the lithic scatter on the gravel platform at Invernaver, Bettyhill, Sutherland.



- 3.1.4 Scatter sites may also be recognised on the surface of gravels including loch edge gravels as at Loch Doon (Ayrshire), or fluvio-glacial and raised beach terraces, e.g. at Bettyhill (Sutherland).
- 3.1.5 New lithic scatter sites are still being discovered, but they have been recorded since the earliest days of archaeological fieldwork in the second half of the nineteenth century. Collection was particularly common in the days when farmers walked the land behind the plough, and when new lands were brought into cultivation, as during the Second World War. It has also been influenced by the work of specific interested individuals, as with Hilda Paterson who collected across the fields at Birkwood on the south bank of the River Dee, Aberdeenshire, in the first half of the twentieth century. Initial recognition of the site at Morton, Fife, owes much to Reg Candow, a local antiquarian from Dundee, while archaeologist Tom Affleck recorded lithic scatters in the vicinity of his holiday home on Loch Doon, Ayrshire. Many of the new scatters found today are the result of fieldwork projects undertaken by Community Archaeology groups such as the Tarradale Through Time project (Highland Region), the Early Settlers Project (Tay Valley), Mesolithic Deeside (Aberdeenshire), and the Biggar Archaeology Group (Lanarkshire).
- 3.1.6 In addition to recent collections, it is worth remembering that museums across the country hold a considerable resource in the form of old collections, many of which have never been catalogued. Some collections, often named after the site or collector, are well known, but many languish within a museum accession list and are rarely regarded as of archaeological interest. This is unfortunate, given that they represent the first material to be removed from a site, though the reluctance of specialists to embark upon cataloguing these assemblages is understandable; they are often large, of uncertain provenance, and poorly bagged. Recent work on the Grieve Collection from Nethermills Farm has shown that they can, however, comprise a valuable archaeological resource. This assemblage is held in Aberdeen City Art Gallery and Museum. It was recovered during fieldwalking across nine sites in the 1970s by Dr James Grieve and numbers 5,701 pieces. It was catalogued in 2018 by Torben Bjarke Ballin who recorded material indicative of human activity

from the Late Upper Palaeolithic to the Bronze Age. Given the paucity of Palaeolithic material across Scotland, the Grieve Collection provides a significant contribution to the understanding of a newly emerging period. It is highly likely that other Palaeolithic material lies within the uncatalogued lithic resource in Scottish museums. That aside, old lithic assemblages indicate valid archaeological locations on the heritage resource map, and more detailed information regarding their contents would undoubtedly assist current understanding of past human activity across the country and the management of prehistoric remains.

3.2 Chronology

- 3.2.1 Lithic Scatters include material from the earliest recorded human activity in Scotland up until the end of the Bronze Age, by which time stone tools were no longer a significant element of material culture (Table 1). Iron Age assemblages do occur, but usually as a smaller element of other sites.
- 3.2.2 Palaeolithic assemblages are often small and may comprise only a few key pieces mixed within a larger assemblage of later date. There are, however, several caveats to this, not least the problems of recognising Palaeolithic stone tools. While classic Palaeolithic types are relatively easily picked out, for example tanged points or larger broader blades, much Palaeolithic material is hard to distinguish from later pieces. Palaeolithic knapping debris, in particular, blends into the general range of material generated in other periods. Notable Palaeolithic sites include Howburn, Lanarkshire and Rubha Port an t-Seilich, Islay, both of which were first recognised as lithic scatters and only through excavation were the unusual characteristics of the assemblages recognised. The problem of underrepresenting Palaeolithic sites within the archaeological record is likely to diminish as specialists become more familiar with Palaeolithic material and as general appreciation of the existence of a Scottish Palaeolithic increases.

TABLE 1

	Knapping Techniques	Tool Blanks	Diagnostic Lithic Types	Scatter Site Examples
LATE UPPER PALAEOLITHIC c.12,700 – 9,800 BC	Cylindrical blade cores	Large, broad blade	<ul style="list-style-type: none"> • Tanged Points • Shouldered Points • Backed Points • End of blade scrapers • Burins • Piercers and awls 	<ul style="list-style-type: none"> • Howburn Farm • Milltimber, Scatter 4
EARLIER MESOLITHIC c.9,800 – 8,400 BC	Single platform cores Soft hammer	Broad Blade	<ul style="list-style-type: none"> • Broad microliths • Scrapers • Burins • Piercers and awls 	<ul style="list-style-type: none"> • Dryburgh Mains, Berwickshire • Nethermills Farm, Grieve Collection
LATER MESOLITHIC c.8,400 – 4,000 BC	Single platform cores Soft hammer	Narrow Blade	<ul style="list-style-type: none"> • Microblades • Narrow microliths • Scrapers • Burins • Piercers and awls 	<ul style="list-style-type: none"> • Nethermills Farm, Aberdeenshire • Bolsay Farm, Islay • Ballantrae, Ayrshire
EARLY NEOLITHIC c.4,000 – 3,500 BC	Single platform cores Soft hammer	Broad Blade	<ul style="list-style-type: none"> • Leaf Shaped Points • Scrapers • Serrated pieces 	<ul style="list-style-type: none"> • Balbridie, Aberdeenshire • Melbourne, Lanarkshire
LATER NEOLITHIC c.3,500 – 2,200 BC	Hard hammer Anvil technique Multi-platform cores 'Levallois' type cores Bipolar cores	Flake Blade	<ul style="list-style-type: none"> • Leaf Shaped Points • Chisel-shaped Points • Oblique Points • Scale-flaked knives • Scrapers • Serrated pieces • Polished knives • Plano-convex knives 	<ul style="list-style-type: none"> • Melbourne, Lanarkshire • Kinbeachie Farm, Invernesshire • Barabhas, Lewis
BRONZE AGE c.2,200 – 1,000 BC	Hard hammer Anvil technique Multi-platform cores Bipolar cores	Flake	<ul style="list-style-type: none"> • Barbed and Tanged Points • Thumbnail scrapers • Serrated flakes and blades 	<ul style="list-style-type: none"> • Blackhouse Burn, Lanarkshire • Biggar Common, Lanarkshire • Barabhas, Lewis

Table 1(left): Diagnostic stone tools and the periods within which they most commonly occur. Much lithic material, such as knapping debris and various types of scraper, is indistinguishable from period to period, and many lithic scatter sites contain material from several archaeological periods. Information about key types of stone tool from different periods can be found in many places, but a good site is [Working Stone \(orkneystonetools.org.uk\)](http://orkneystonetools.org.uk) which has clear images and explanations.

3.2.3 Mesolithic scatter sites are often notable for the density of pieces. Sites with over 100 pieces per square metre on the surface of a field are not uncommon. While small, discrete, Mesolithic scatters are known, some sites cover considerable areas. The lithic scatter along the River Dee at Nethermills of Crathes extends for 2 kilometres. In general Mesolithic sites contain a mix of worked tools (retouched and unretouched), including many microliths, as well as much debitage, some of which is very small. Neolithic scatters are usually less dense than Mesolithic scatters and they may be more discrete. The same goes for Bronze Age scatters. Both Neolithic and Bronze Age scatters are likely to contain worked tools alongside knapping debris.

3.2.4 In reality, human activity has often occurred on the same spot over the millennia, even if not continuously. Many lithic scatters are mixed, palimpsest, sites that combine elements from different periods. Some tool types were ubiquitous throughout prehistory, meaning that it can be difficult to separate out the evidence for different periods of activity. Scrapers, for example, occur on sites of all periods. While experienced specialists can separate Palaeolithic, Mesolithic and Neolithic scrapers and thus assign chronological definitions to varying parts of a scatter, regional variations, depending on raw materials and local knapping traditions, can obscure the picture.



Figure 13: Stone tools from the lithic scatter site at Kinloch Rum, which was excavated in the 1980s. On the left: Microliths, a typical Mesolithic tool type. On the right: Scrapers, a multi-purpose tool which was used in many periods.

4 Biography of a Scatter

- 4.1 Lithic scatters have two parts to their biographies: as archaeology and as an asset. Given their role as a significant archaeological resource it is important to understand the formation processes and ensure that the ploughzone is treated as a full part of the archaeology on individual sites.
- 4.2 The archaeological life of a lithic scatter originates in the debris left from human activity within the landscape. Whether settlement or other form of behaviour, once activity has ceased and the site has been abandoned, then the remains of any lithics in use enter the archaeological record. At this stage remains are *in situ*, that is to say, the lithics are stratified within the context of the original archaeological material. Subsequent disturbance may occur as a result of many processes, including animal action, human action or natural events, that will damage the original context of the material, sometimes resulting in the formation of a scatter site on the contemporary ground surface. Over the millennia, repeated activity and disturbance can result in the accumulation of material from several periods in a site that is spread throughout the ploughzone or upper levels of the ground. As noted above, research indicates that stone artefacts within the plough soil undergo complex processes of vertical and horizontal movement. Where field collection or excavation has recorded the spatial location of the lithic artefacts, detailed spatial analysis is useful to assess this movement, for example by producing contour maps of location. While it can be

possible to discern ‘ghost features’ within a plot of stone tools from a ploughed surface, the pieces recovered from the surface of the field are not always representative of the original assemblage given research indicating that smaller materials can migrate downwards. Repeated fieldwalking is necessary to collect a representative sample of material from any lithic scatter site.

4.3 The life of a scatter as an asset begins as soon as the assemblage is collected. Careful recording is necessary to maximize information. Good practice in fieldwalking is discussed below (Section 8.1.3) where meticulous bagging, recording and storage is important. At this point the assemblage may be washed and catalogued. Some groups, as with Mesolithic Deeside, have developed rapid assessment techniques which allow for the production of basic information relating to an assemblage (Section 8.1.5) within a few days of collection. This is vital for archaeological interpretation and strategy, as well as for public information and media releases. Assemblages that go into storage and are not processed for several years lose significance.

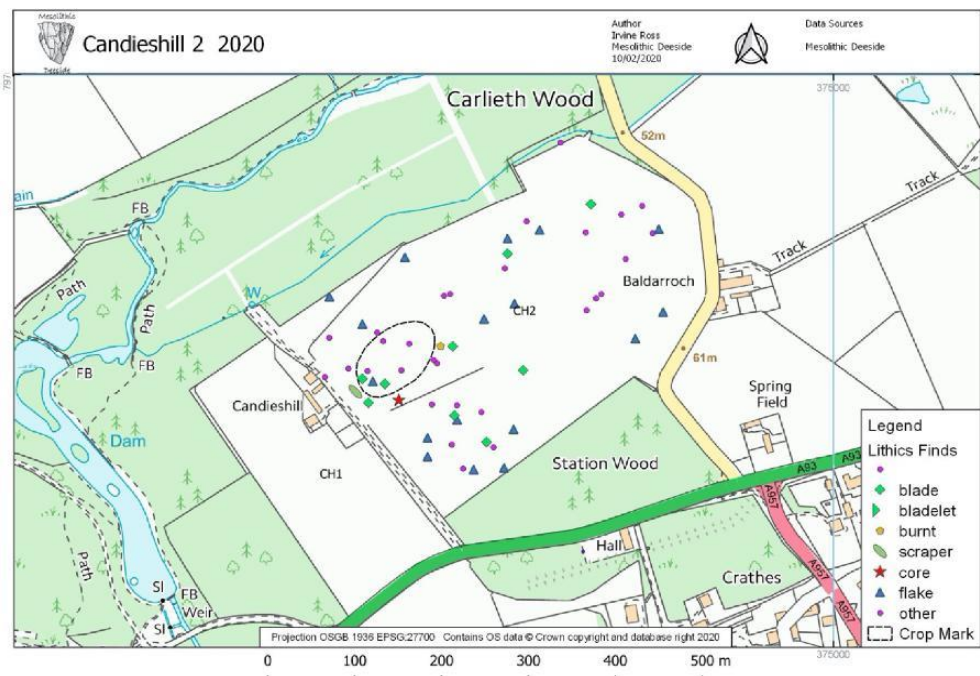


Figure 14: Scatter plot of lithics found during fieldwalking by Mesolithic Deeside. Plots like this are produced within a day or so of fieldwalking and can be used to plan future work and maintain team enthusiasm! © Crown copyright and database rights 2020 OS 0100020767.

4.4 Once analysed the material will pass into the hands of a museum; this usually takes place through the offices of the Treasure Trove Unit who receive information relating to both chance finds and excavated or fieldwalked material and who seek to allocate material to appropriate long-term homes. Museums are free to bid for material, and in many cases, but not all, this will be a local museum. In order to house material, museums have to be registered with Museums and Galleries Scotland which ensures that appropriate storage conditions are maintained. Particularly significant assemblages, in Scottish terms, may be allocated to the National Museum, and where part of a collection is already housed somewhere, the presumption is usually against dividing material so that subsequent finds from the site go to the same location, thus facilitating future research. Once in a museum, the assemblage will be accessioned, stored or displayed, and it becomes available for research and educational purposes at the discretion of museum staff. As a rule, the wellbeing of the archaeological asset is always foremost in the minds of curators.

5 Attitudes to Lithic Scatter Sites elsewhere in the UK

5.1 In Scotland, lithic scatter sites have long been viewed as a low-value archaeological resource, an archaeological site that is so disturbed that detailed examination is rarely worthwhile. In contrast, in England, where upstanding archaeology is less frequently preserved, scatter sites are more often considered a resource: an indication of a site that is likely to repay investigation. The topic has been explored by a variety of authors since at least the early 1990s (for example Zvelebil et al. 1992). Historic England first published guidelines regarding the management and investigation of lithic scatter sites in 2000 (English Heritage 2000) and in 2019 they embarked on a process to revise and update this. In Wales, too, lithic scatter sites have generally been regarded as a valid source of useful archaeological information (for example Silvester and Owen 2002). Elsewhere in Europe, there has been much research on the information to be obtained from scatter sites, and they are rarely neglected to the extent that they have been in Scotland to date.

Part 2

6 Managing Lithic Scatters in Scotland

The overarching aim of good management of a lithic scatter site seeks to interpret and assess its contribution to prehistory, while ensuring the future wellbeing of the scatter and associated archaeological remains where possible.

6.1 Potential Research Contribution of Lithic Scatter Archaeology

6.1.1 Despite the evident disturbance, and thus apparent limitations, of scatter sites as an archaeological resource, they can yield much useful material pertinent to local and national prehistory. A lithic scatter site is always an important indicator that archaeology exists at this specific location. Given that sites dating to earlier prehistory rarely leave upstanding remains, the role of lithic scatters to signify the presence of early prehistoric activity is particularly significant. While some lithic scatters indicate remains that do not include surviving stratified archaeological features below the ground surface, many do mask *in situ* archaeology. The investigation of a number of lithic scatter sites around the coasts of the Lothians and the Borders has led to the recognition of early ninth millennium house sites, such as at South Queensferry and Dunbar. This site type has only recently been recognised and is regarded as of particular importance for our understanding of the early post-glacial settlement of Scotland.



Figure 15: Havelte style shouldered point discovered on the lithic scatter site at Nethermills Farm. Rare pieces like this provide important indications of the earliest period of human activity in Scotland, the Later Upper Palaeolithic when no other archaeological remains have yet been recognised.

- 6.1.2 Basic analysis of the lithics (Section 8.1.5) will usually provide an indication of the chronological period, or periods, of the site. While most lithic scatter sites result from the disturbance of several episodes of prehistoric activity on one site so that a wide chronological range of material may be present in the same plough soil, it is sometimes possible to separate different periods and areas of accumulation across a site.
- 6.1.3 Information relating to the raw materials of which the scatter is composed is easily collected (Section 8.1.5). This can be used to tie the site into a local context, by comparing the raw materials with those in use on other sites in the locality. It can also provide information regarding possible wider networks of transport and communication through analysis of the likely sources from which material has been extracted and other locations where it was used in prehistory.
- 6.1.4 Analysis of the lithic artefacts can yield useful information relating to manufacturing (knapping) techniques. As seen in Table 1, knapping techniques vary across the chronological periods, though they also depend on locally available raw materials. Work at Tarradale, Ross-shire, shows that the Mesolithic community recycled and reworked some tools to overcome a shortage of local flint.



Figure 16: Flint knapping results in the production of many incidental waste flakes and these can be useful to reconstruct the local technology and uncover more detail about a site.

- 6.1.5 Consideration of artefact types and variety can be used to discuss possible activities represented on site. As most sites represent palimpsests of prehistoric activity it may be necessary to consider different aspects of this information. More specialised analysis can include the investigation of usewear and residues (Section 8.2.5), but, given the cost and time involved, the potential benefits of this work need to be weighed

carefully against the fact that the lithics are unlikely to be *in situ* and several episodes of activity may be involved.

6.1.6 Given the likelihood that multiple activity episodes and several chronological periods may be represented within any one scatter site, it follows that they provide important evidence of places that have attracted human communities on more than one occasion over considerable periods of time. Sites like this are often known as Persistent Places; they may simply reflect the advantages of a well-chosen spot with shelter, fresh water, and other resources, or they may reflect significance of spiritual or symbolic value. The combination of lithic and spatial information will sometimes help to elucidate specific functional zones or areas relating to particular periods, though on many lithic scatter sites, lithic artefacts from different activities or functions are well mixed.



Figure 17: Simplified Plan of the site at Garthdee Road, Aberdeen, showing the distribution of flint artefacts as contours of density (contour intervals: 3)

6.1.7 When information relating to the wider topographic setting and other sites in the area is considered, lithic scatter sites can be used to broaden understanding of the use of the landscape. Contextual evidence like this can help to shed light on wider patterns of human activity along a navigable river, upland routeway, at the coast, or within a forested hunting area. In this way, it is possible to build interpretations of the 'landscapes of activity' within which local communities operated. It is also possible to consider the changing patterns of activity through time and/or space within a single landform such as an upland valley or a lowland plain.

6.2 Limitations of Lithic Scatter Archaeology

- 6.2.1 The relationship between a lithic scatter and the archaeology beneath remains unknown without deeper investigation. Within the ploughzone, the material on the surface of the ground comprises only a small portion of the whole assemblage. Research suggests that between 2% and 5% of a lithic scatter will lie on the surface of the ground (Billington 2016). The situation in a deflating sand dune system is different as is that of other scatter site locations.
- 6.2.2 As the ploughzone is a dynamic environment, the lithics within the plough soil are subject to movement both horizontally and vertically. This movement results from a combination of agricultural practices, such as ploughing, and animal/natural processes, such as worm action or the percolation of water. The composition of the material on the surface, is subject to change with time, and may not always reflect the lower levels. Research on the movement of stone within the plough soil indicates that while horizontal movement is usually surprisingly little, vertical movement can cause more disturbance, not least because different sizes of lithics move differentially. Smaller pieces can migrate downwards while larger pieces move towards the surface. Microliths may be underrepresented in a surface collection when compared to scrapers. This impacts on the assessment of both the period of the assemblage (preferencing later periods such as the Later Neolithic or Bronze Age in comparison to the Mesolithic), and the activities represented by the tools. It is also worth noting that finds may be trapped in plough marks or animal burrows with concomitant impact on the surface material.
- 6.2.3 The processes of movement within the ploughzone mean that once a scatter is collected from the surface of the ground more material will appear after time. This material may, or may not, be similar to that which has already been removed. It is often the case that the first sweep of a field will yield larger pieces than later sweeps, due to a combination of collector inexperience, or bias, and the initial migration upwards of the larger artefacts. It is therefore necessary to walk a field several times before all elements of an assemblage might be represented. It is also necessary to be aware of the individual bias of fieldwalkers which can lead to

overrepresentation of one particular artefact type such as cores or microliths. Where possible, different fieldwalkers with different interests should be deployed. Recent investigation of the various episodes of collection from Nethermills Farm, Aberdeenshire, indicate that while the initial collection provided accurate information relating to the general date and nature of the assemblage, subsequent collections added considerable detail to refine the contents and chronological affiliations of the site. The initial collection here yielded over 3,000 pieces, while subsequent collections over the ensuing decades produced over 5,000 more, plus another 30,000 from excavation.



Figure 17: The members of Mesolithic Deeside community archaeology group at work in Aberdeenshire.

- 6.2.4 Interpretation is complicated by the likely presence of material derived from multiple periods and multiple activities. It can be possible to separate out specific chronological and functional indicators, and on occasion it is possible to identify clusters within a field that represent particular times or tasks, but the expense of detailed work such as this has to be weighed against the likelihood of success.
- 6.2.5 The overarching limitation must lie in the fact that any lithic scatter site represents archaeology that is, by definition, disturbed to some degree. Various analyses can be used to extract useful information, but, where undisturbed sites also exist, it might be necessary to prioritize their examination. Nevertheless, some scatter sites mask significant *in situ* archaeology below the plough soil and these may merit detailed examination. For this reason, basic investigation, for example in the form of

test pitting (Section 8.1.4), is recommended to check for the possible survival of stratified features and *in-situ* archaeology in the subsoil.

7 Implementing Management

To ensure the wellbeing of the archaeological resource, lithic scatter sites require active management. Given the number of lithic scatter sites across Scotland and the constraints of funding, it is not possible to treat every site equally.

7.1 Management Outcomes

Successful management requires fulfilment of several outcomes following the overall aim of assessing the significance of the site, and thus deciding on the most appropriate management plan for the site:

- The *recording* of location, size, boundaries, and archaeological context.
- The *investigation* of contents, geomorphological context, spatial distribution, and the possible preservation of features.
- The *assessment* of integrity, chronology, archaeological interpretation, vulnerability, significance, and restorative action or mediation.
- The *communication* of results through media, academic publication, and community information.

7.2 Assessing a Site

To maintain a living landscape for the twenty-first century it is necessary to assess the significance of any lithic scatter site before deciding upon an appropriate course of management. In general, the significance of a site will depend on the archaeological preservation, or *integrity*, of the site and the degree to which the site is representative of the prehistoric community at a national, regional, or local level, as well as the *rarity* of the site. While archaeological preservation will generally have to be high for a site to be considered significant, representativeness and rarity are more difficult to judge. In some cases, a site that is of a type rarely encountered in a locality may be considered significant but in other cases a site that contributes to a wider body of pre-existing material will also be significant (Section 10).

7.3 Recording

7.3.1 **Location:** grid reference; slope; aspect; ground cover; present land use; prominent features (e.g. rivers or woods). The selection of relevant information may vary according to the aims of an individual project. While some locations will already bear a name, others may need naming. In most cases the field name is sufficient but on occasion it will be necessary to use the nearest farm or prominent feature. For the purposes of interpretation some sites will transcend field boundaries (which are obviously more recent), so that a single site will comprise several fields in which case the most prominent might supply an overall site name.

7.3.2 **Size:** geographic and numeric. There are many caveats regarding the size of a scatter site. Material may be obscured by the build-up of soil or sediments or reduced by erosion. Weather conditions may not be conducive to the exposure of artefacts. Nevertheless, information relating to the size of a scatter at any one point in time is necessary to help assess significance. Given the variety of factors influencing size, other information is usually necessary to refine interpretations. A few pieces could represent an undisturbed small site, a particularly rare early site, background noise, or an incomplete scatter. A larger site might be totally disturbed, multi-period, or intact.

Figure 18: Daer Reservoir, Lanarkshire, several discrete lithic scatter sites were revealed by low water levels in the reservoir (Ward 2017).



7.3.3 **Boundaries:** are the edges of the scatter clear-cut or do the lithics gradually decrease? Are the edges impacted by more recent events such as erosion, slope wash, or modern development?

7.3.4 **Archaeological context:** a basic record of other sites in the vicinity. It is useful to record proximity, period, site type, finds; but precise information will depend on the project.

7.4 Investigation

7.4.1 **Contents:** basic assessment of raw materials and artefact types. This may, or may not, be a comprehensive analysis depending on the project. In many cases a rough estimation is adequate at this stage (Section 8.1.5).

7.4.2 **Geomorphological context:** a description of the nature of the site and formation processes. Initially, this may be a rough description rather than the result of detailed specialist analysis.

7.4.3 **Spatial distribution:** the use of a Geographic Positioning System (GPS) to record the individual location of pieces as they are found across a scatter site allows for a rapid assessment of foci of material. This may be general concentrations of lithics, or, once basic types have been ascertained, it can relate to specific concentrations such as cores, retouched pieces, or particular types of raw material. Spatial distributions help to refine interpretation and assist investigation and management plans. They can also facilitate the comparison of one site to another where several individual scatter sites occur in one location such as a river valley or stretch of coast.

7.4.4 **Preservation:** occasionally surviving features, such as stonework or midden-type deposits can be observed in association with the initial investigation of a lithic scatter site (Table 2). In many cases more detailed assessment of surviving stratified archaeology is best left for further work, including test pitting.

TABLE 2	Possible Features	Possible Stratified Finds
Palaeolithic	<ul style="list-style-type: none"> • Old Land Surfaces • Palaeochannels • Hearths 	<ul style="list-style-type: none"> • Flaked stone • Coarse stone tools
Mesolithic	<ul style="list-style-type: none"> • Old Land Surfaces • Palaeochannels • Hearths • Pits • Post holes • Cobbled surfaces • Middens 	<ul style="list-style-type: none"> • Flaked stone • Coarse stone tools • Pumice • Worked bone and antler
Neolithic	<ul style="list-style-type: none"> • Old Land Surfaces • Palaeochannels • Hearths • Pits • Post holes • Ditches • Stonework • Cobbled surfaces • Middens 	<ul style="list-style-type: none"> • Flaked stone • Coarse stone tools • Pumice • Worked bone and antler • Pottery
Bronze Age	<ul style="list-style-type: none"> • Old Land Surfaces • Palaeochannels • Hearths • Pits • Post holes • Ditches • Stonework • Cobbled surfaces • Middens • Metalworking remains 	<ul style="list-style-type: none"> • Flaked stone • Course stone tools • Pumice • Worked bone and antler • Pottery • Metalworking debris • Non-ferrous metal object

Table 2: Different types of archaeology that might survive below a lithic scatter site.

7.5 Assessing Results

- 7.5.1 **Integrity:** an assessment of damage / the intact nature of the site based on information noted in 7.3 and 7.4, in particular: lithic contents; geomorphology; and the preservation of stratified features. Although the very existence of a lithic scatter site implies some degree of damage to the archaeology (in order to pull lithics to the surface of the ground), this is a necessary step to determine archaeological significance and appropriate management.
- 7.5.2 **Chronology:** a variety of techniques help to assess chronology including lithic typologies, radiocarbon, or other dating if available (and only where appropriate *in situ* sample material can be obtained), and geomorphology.
- 7.5.3 **Archaeological interpretation:** an assessment, as far as possible, of the date(s), functions(s), and cultural context(s) of the site using information discussed above. Many lithic scatter sites relate to more than one period of human activity. In some cases, one cultural period may be predominant, other sites result from mixed activities over a long period of time.
- 7.5.4 **Vulnerability:** an assessment of active threats to the site including natural processes such as erosion, and human activity, as well as likely future threats.
- 7.5.5 **Significance:** the significance of a lithic scatter site depends on values like rarity and integrity which may vary from region to region and according to local or national management aims (Section 10). Individual criteria may be judged differently according to the overall circumstances of a project. A site that is substantially disturbed so that no stratified archaeology survives might generally be assessed as of little significance whereas a similar site with other assets, such as the presence of Late Upper Palaeolithic material, might be considered to be of considerable significance. Consultation with curatorial bodies such as the Local Authority Regional Archaeologists and Historic Environment Scotland is advised.

7.5.6 **Restorative action or mediation:** sites deemed to be of high significance may be subject to proactive management to ensure the future wellbeing of the resource (Section 10).

7.6 Communication

7.6.1 **Audience:** the archaeological audience includes specialist archaeologists, the Local Authority Archaeologist, Treasure Trove, other related professionals (such as construction workers or environmental specialists), and members of the public including the local community and those further afield. Consider communication scales, ranging from those at a local level to regional to national as appropriate.

7.6.2 **Methods:** methods of communication need to be tailored to the audience and include written, verbal, visual, and hands-on activity. Professional archaeologists appreciate written material including papers and books whether in electronic or printed format. Related professionals also make use of written materials but may appreciate lectures and talks. Visual and practical materials are particularly appropriate for the public audience, but written and verbal communications are also useful to them. 'Public' includes a wide variety of sub-groups and dissemination needs to be tailored appropriately: material that is aimed at primary-age children will not be so useful to a group of older enthusiasts. Very occasionally, the vulnerable nature of a site might mean that wider publicity is not advisable.

8 Archaeological Techniques

A variety of techniques are appropriate for individual outcomes. Investigation can be divided into two stages: the initial assessment and detailed investigation. While initial assessment should always take place, detailed investigation is dependent on both the results of initial assessment and on the overall aims of the project and may be postponed or not take place at all. It is vital that any archaeological finds be securely stored in well labelled bags to facilitate future work even after some lapse of time.

8.1 Initial Site Assessment

The aim of initial assessment is to produce enough information relating to the scatter site for a rapid decision to be made regarding the interpretation, significance, and vulnerability of the site and thus of appropriate management techniques.

This information can be used to inform the need for detailed investigation, and future management options for the site. Initial assessment should be rapid, simple, and relatively cheap. Appropriate techniques include desktop survey, walkover survey, fieldwalking, test pitting, and rapid lithic assessment.

Consideration might be given to geophysical survey at this stage, but it is usually part of a subsequent detailed analysis (Section 8.2.1). See Table 3 for a summary of each technique's contribution to understanding a site.

TABLE 3

	Location	Size	Boundaries	Archaeology Context	Contents	Geomorph. Context	Features
DESKTOP SURVEY	✓			✓			
WALKOVER SURVEY	✓	✓	✓	✓		✓	✓
FIELDWALKING		✓	✓	✓			
TEST PITTING		✓	✓		✓	✓	✓
RAPID LITHIC ASSESSMENT					✓		

Table 3: The investigation of Lithic Scatter Sites – Initial Site Assessment

8.1.1 Desktop Survey (ClfA 2017): Consideration of all related archival material including documents, maps, and photographs for previous indications of the site or reports of work undertaken there. Desktop survey is frequently regarded as of limited use for assessing lithic scatter sites, but it is a necessary step particularly when obtaining information on other archaeological material in the area. Desktop survey should include examination of relevant Historic Environment Records (HER) held by the Local Authorities, and the National Record of the Historic Environment (NRHE) held by Historic Environment Scotland, both of which provide details of known sites within an area. Related work, such as that pertaining to geological mapping, may also contain references to archaeology, so it is important to consider a wide range of material related to the past investigation of an area. This may involve consultation in several different archives and local records.

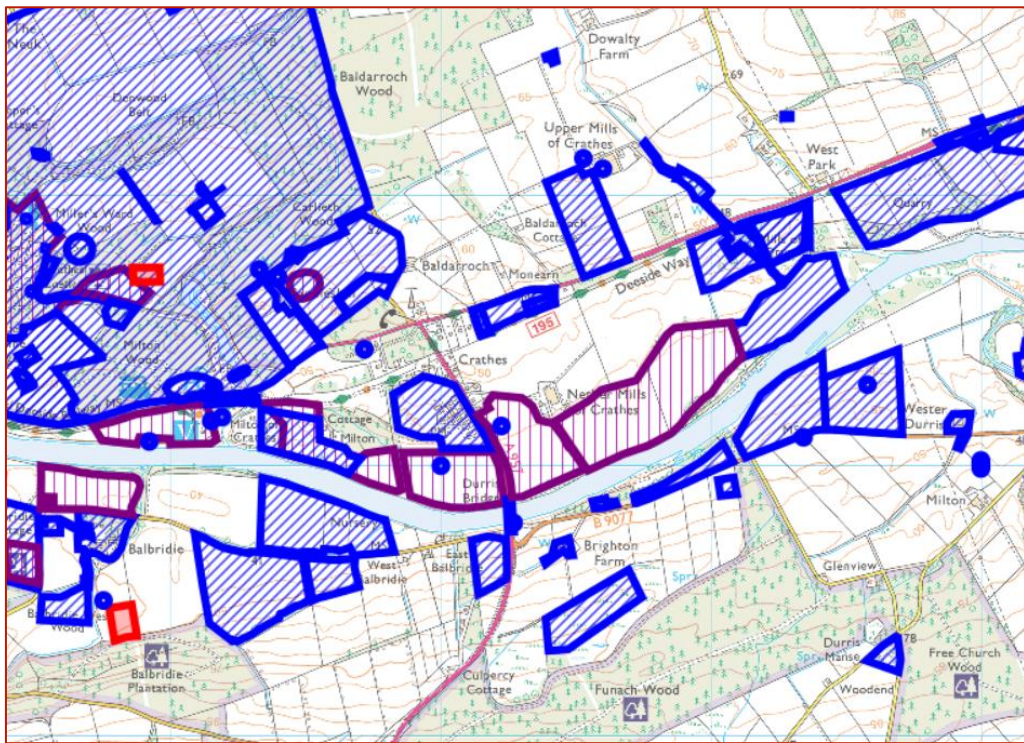


Figure 19: Local Historic Environment Records (HERs) are an important starting place for information about a lithic scatter site, and the known wider historic environment around it. This example is taken from the Aberdeenshire HER map overlay showing the extent of known sites on part of Deeside, including the Nethermills Farm lithic scatter.

8.1.2 **Walkover Survey** (CIFA 2014a & b): At least one visit to the site and its environs should be made, to include the examination of the area of the scatter for other archaeological material or features, active erosion, basic geomorphological context, visible site boundaries, and locational details.

8.1.3 **Fieldwalking**: In most cases the presence of a lithic scatter site means that the ground surface has been disturbed. On occasion, previous work may have recorded a scatter that is no longer visible, but vulnerable to current activity. In all cases, fieldwalking is best undertaken after preliminary disturbance such as ploughing and or harrowing. Fieldwalking seeks to collect a representative sample of archaeological material from the surface of the site by walking transects across the ground and scanning the surface for finds which are then bagged and individually recorded according to position. The recording of the precise location of finds is important and easily achieved using dGPS. Fieldwalking is best undertaken once the newly exposed surface has been weathered, for example a couple of days after rain, to ensure that lithics are exposed. It is important that those undertaking fieldwalking are familiar with all the different types of raw material from which tools were made at that site. Stone tools are not just of flint: chert; quartz; agate; bloodstone and a range of other local stones were often used. Flaked quartz can be particularly hard to recognise, but collaboration with a lithic specialist helps to facilitate this.

If possible repeated visits to a site will ensure that a representative sample of material is collected. Even where a site has been walked for many years, more material will still come to the surface on new visits and research indicates that it is only possible to build a representative sample of material by collecting over a number of years. This is rarely possible for a rapid assessment, but local museums may hold earlier collections that should be considered. While it may not be feasible (in time or money) to build in the commitment for a commercial archaeological unit to make repeated visits to a site, liaison with a local community group can solve the problem as they often provide enthusiastic and skilled teams well versed in fieldwalking.



A



B



C



D

Figure 20: The effects of weathering on the surface of a field. A) A recent frost has served to shatter vulnerable stones in the topsoil. B) Two weeks after ploughing. C) Four weeks after ploughing. D) Three months after ploughing.

Various walking strategies have been proposed for fieldwalking, from individuals walking contiguous strips (usually lines at a spacing of 2m) across a site to pairs of people walking at 20m intervals. Work undertaken by Mesolithic Deeside and other groups suggests that the information obtained from wider spaced transects is still of use for the basic assessment of the nature of a site, and this has the advantage that the survey is completed more rapidly and results in fewer lithic artefacts for analysis. Nevertheless, the precise fieldwalking strategy will also depend on other considerations such as weather, number of individuals doing the work, and the nature of the project. Rapid assessment may require widely spaced transects and limited repeat visits. A community group may have more time to do this, as well as other aims to fulfil such as training or social needs.

8.1.4 Test Pitting: The excavation of small test pits down to the base of the plough soil may be undertaken relatively quickly, allowing many pits to be dug to assess archaeological survival across a site. The size of individual pits is dependent on the project. Some choose to open squares of 2m by 2m, others may be guided by the bucket of a small mechanical digger, elsewhere smaller pits may be judged adequate. The spacing of pits will also vary from site to site, but in general it is important to avoid possible biasing factors or intervals that are uniformly too great or too small. For this reason, a stratified random sample is often used as it provides even coverage across the site while avoiding the pitfalls of too regular a spacing. Topsoil may be removed by digger or by hand, but it is useful to sieve a regular amount (e.g. two buckets) from the topsoil to identify finds while allowing rapid excavation. Dry or wet sieving will depend on the location and circumstances. Excavation is best undertaken by hand for a 10cm spit immediately above the subsoil. Visible features within the subsoil should be recorded with photographs and drawings. Finds can be kept for analysis or else complete a rapid assessment on site and return them to the test pit before backfilling. For reasons noted above (Section 2.4) test pits should also be dug well beyond the area of the lithic scatter, away from the zones where lithics have been recovered. In this way it is possible to assess the possibility of surviving archaeology and the size of the site.



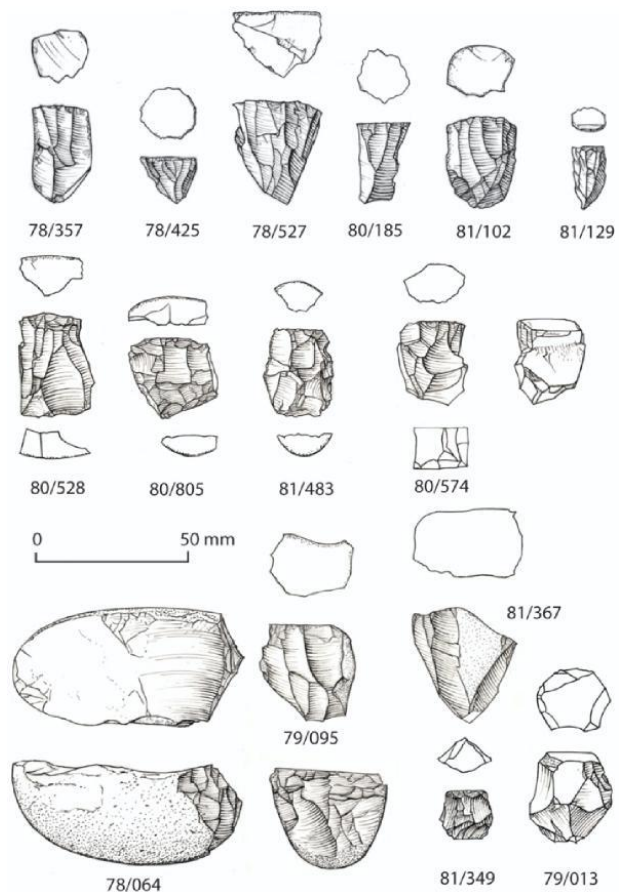
Figure 21: Left) Opening up a test pit at Nethermills Farm, Aberdeenshire, 2019.
Right) Detail of the excavation of the same test pit.

8.1.5 Rapid Lithic Assessment: rapid lithic assessment provides the tool whereby a variety of basic information (e.g. date/s; assemblage size; composition) about a scatter site can be judged, and it is vital to the success of any project. Where large numbers of finds occur, analysis of the assemblage can be slow. With this in mind, it is useful to prioritize the metadata (information fields) to be recorded. In general, the pieces should be washed before they are passed to the lithic specialist as it is usually both expensive and time consuming for the lithic specialist to wash a collection. However, prior discussion of possible analyses such as usewear analysis (Section 8.2.4) where washing is not advised needs to be completed in advance (note that usewear analysis is rarely productive on an assemblage that is not *in situ*). While the metadata to be recorded will depend on the aims of individual projects, the following information has been found to provide the basic information necessary for the assessment of a scatter site: raw material; visible indications of burning; type; sub-type (e.g. type of core, type of retouched piece). With this information it is possible to assess chronological and cultural associations of the material as well as a basic idea of overall function (knapping debris, specialist site, etc.) and this may then be combined with the spatial information to identify different lithic concentrations across the site, if present. It is important to prioritize lithic assessment in the immediate weeks following fieldwalking. While community archaeology groups can provide experienced fieldwalking teams, they do not usually incorporate specialised lithic analysis skills and consideration should be given to employment of a lithic specialist for this stage.

Projects that are due to take place over some time may wish to include an element of lithic training as part of their work to transfer the skills of basic lithic analysis to the wider membership. More detailed lithic investigation may be undertaken as necessary.

8.1.6 **Illustration:** Clear illustration of key pieces from the scatter (cores, retouched pieces, a selection of blades and flakes) is vital. This provides information relating to the types of lithics present as well as technological detail of knapping patterns. The illustration of lithic artefacts is a specialised technical process and should only be undertaken by qualified and experienced illustrators. The Association of Archaeological Illustrators and Surveyors has published a detailed guide to drawing stone tools and this should be consulted with regard to technique (Martingell and Saville 1988). Many people prefer drawings to photographs of lithic artefacts because of the lack of detail in a photograph, though financial restrictions sometimes mean that photographs are necessary for the initial investigation report, and drawings are only made use of in a detailed investigation. This is not ideal, but better than no illustration at all.

Figure 22: Flint cores from the site at Nethermills Farm, Aberdeenshire. In addition to size and shape, drawings of stone tools convey information such as manufacturing techniques and breakage patterns. It is a highly specialised process.



8.2 Detailed Site Investigation

The aims of detailed investigation vary with individual projects but in general they seek to elucidate specific elements of interest or uncertainty relating to the scatter site, its overall context, or surviving sub-surface archaeology.

In depth geophysical work, including remote sensing where appropriate, sediment sampling and analysis, excavation, and specialist finds analysis should all be considered for possible further work on a Lithic Scatter Site (Table 4). Given the expense of the individual techniques they would usually only be undertaken where the significance of a site and research value of a project is judged to merit the investment of resources. While detailed investigation may make use of a local or inexperienced workforce, it should always be led by a specialised team that includes all relevant technical knowledge.

TABLE 4	Contents	Geomorphological Context	Features
GEOPHYSICS		✓	✓
SEDIMENT ANALYSIS		✓	✓
GEOARCHAEOLOGICAL DEPOSIT MODELLING		✓	
EXCAVATION	✓	✓	✓
SPECIALIST FINDS ANALYSIS	✓		

Table 4: The investigation of Lithic Scatter Sites – Detailed Site Investigation

8.2.1 **Geophysics** (CIFA 2014c): Several geophysical techniques exist to investigate site features and formation (Table 5). The efficacy of individual techniques is dependent on both the local conditions of the site (Table 6) and the information to be retrieved. Specialist advice is necessary.

TABLE 5	Palaeolithic	Mesolithic	Neolithic	Bronze Age
GRADIOMETER	<ul style="list-style-type: none"> • Palaeochannels • Hearths 	<ul style="list-style-type: none"> • Hearths • Pits¹ • Post holes¹ • Middens 	<ul style="list-style-type: none"> • Hearths • Middens • Pits¹ • Post holes¹ • Ditches • Ring-ditches 	<ul style="list-style-type: none"> • Hearths • Kilns and furnaces • Middens • Pits¹ • Post holes¹ • Ditches • Ring ditches
RESISTANCE²		<ul style="list-style-type: none"> • Cobbled surfaces 	<ul style="list-style-type: none"> • Cobbled surfaces • Stone walls / structures • Cists 	<ul style="list-style-type: none"> • Cobbled surfaces • Stone walls / structures • Cists
GROUND PENETRATING RADAR	<ul style="list-style-type: none"> • Base of peat • Palaeosurfaces • Palaeochannels 	<ul style="list-style-type: none"> • Cobbled surfaces 	<ul style="list-style-type: none"> • Cobbled surfaces • Stone walls • Cists • Large pits / ditches 	<ul style="list-style-type: none"> • Cobbled surfaces • Cists • Large pits / ditches
MAGNETIC SUSCEPTIBILITY³	<ul style="list-style-type: none"> • Occupation areas 	<ul style="list-style-type: none"> • Occupation areas 	<ul style="list-style-type: none"> • Occupation areas 	<ul style="list-style-type: none"> • Occupation areas

Table 5: The use of different geophysical techniques for individual periods and types of features.

¹A finer sampling interval may be required. The standard sampling interval is 1m by 0.25m, but 0.5m x 0.25m or 0.25m x 0.25m may be needed to resolve small features.

²Resistance survey at 0.5m by 0.5m interval is recommended.

³Can provide coarse delineation of areas of occupation within a field. The level of detail will depend on sample intervals. Reconnaissance survey can be undertaken at 10m intervals, while limited survey could be done at 1m intervals to provide more detail. This is an excellent technique for community groups to do alongside fieldwalking.

TABLE 6

	Beach Sand / Machair	Aeolian Sand	Arable / Pasture	Peat	Waterlogged	Igneous Geology
GRADIOMETER	✓	✓ ¹	✓	✓ ²	✓ ²	
RESISTANCE	✓ ¹	✓ ¹	✓	✓ ²	✓ ²	✓
GROUND PENETRATING RADAR	✓	✓	✓	✓ ²	✓ ²	✓
MAGNETIC SUSCEPTIBILITY	✓	✓ ¹	✓		✓ ²	✓

Table 6: The use of different geophysical techniques by condition and type of site.

- ✓ Technique should work in most cases.
- ✓¹ Technique should work, but it will be dependent on the ground conditions and the ability to physically collect the data.
- ✓² Technique may work, but it will be dependent on the contrast between any features and the natural.

8.2.2 Sediment Sampling and Analysis: Sediment sampling can provide information relating to the prehistoric context of a site and help to elucidate the natural processes that have impacted on site formation. It is usually achieved through coring, often in conjunction with geophysical survey to identify suitable locations (which may be a little distance from the scatter site) from which to obtain samples. Individual core sediments can be subsampled and used for several different investigations, for example into pollen, ostracods, diatoms, insect remains, soil chemistry, and ancient DNA. All require specialist skills, not least to ascertain the most appropriate techniques for the questions to be posed.

8.2.3 **Geoarchaeological Deposit Modelling** (English Heritage 2015): Remote sensing using geophysics may be combined with sediment sampling and analysis to build models of buried land surfaces. This is a useful tool to locate traces of prehistoric activity that are no longer visible, and of especial relevance for Palaeolithic archaeology where the old land surface may bear little relation to the present. It is also of use for the reconstruction of site formation processes.

8.2.4 **Excavation** (CIFA 2014d): Excavation takes place across wider areas and provides more detailed information about a site. Excavation will usually only take place where the stratified archaeological remains are deemed to merit it. Depending on the nature of these remains, and aims of the project, a range of possible excavation techniques may be considered (Table 7).

Excavation is a specialised undertaking that requires a skilled team and adequate resources. It should never be undertaken without a research design to set out the overall aims of the project and the strategy by which they will be achieved. It is also important to remember that excavation incorporates two aspects: fieldwork and post-excavation work, and the latter may well take considerably longer and be more expensive than the former. No excavation should take place without adequate finance for full post-excavation and publication of the results. Excavation will remove and destroy the archaeology of any area over which it is undertaken. The decision as to whether or not excavation is necessary, and where to place trenches, would be based on the results of test pitting together with other previous investigation such as geophysics. It will also depend on the aims of the project. Excavation rarely takes place as part of an initial site assessment, it is more usually part of further work, and dependent on issues such as rarity, integrity, and threat. One benefit of excavation is that where stratified material is present it can facilitate the dating of deposits through the use of techniques such as radiocarbon assay, optically stimulated luminescence, or thermoluminescence, and thus help to build a more accurate chronology of the site. Where preservation is favourable, excavation can add considerable information pertinent to the interpretation of the prehistory of an area, but it is never undertaken lightly, and it does require specialised assistance.

TABLE 7

	Digging	Recording	Sampling	Post-excavation Analysis
Trial Trenching	✓			
Grid Square Excavation	✓			
Open Excavation	✓			
Excavation through Spits	✓	✓		
Single Context Recording	✓	✓		
On-site Sampling		✓	✓	
Wet or Dry Sieving			✓	
Flotation			✓	✓
dGPR Recording		✓		
Spatial Analysis				✓
Survey and Planning		✓		✓
Photography		✓		✓
On-site Conservation	✓			✓
Finds Recording and Processing				✓

Table 7: The most common elements of excavation.

8.2.5 Specialist Finds Analysis: The specialist analysis of excavated material is an essential part of the post-excavation process. It can involve a wide range of techniques, which will depend on the material recovered, the character of the site, and the aims and finance of the project. As the focus of this document is on lithic scatter sites, this section will consider specialist lithic analysis, but other artefacts may occur, and all will require specialist attention. The different techniques of specialist lithic analysis can be used to investigate considerable detail of a lithic scatter (Table 8). It is, nevertheless, both time consuming and costly and the integrity of the scatter, contexts of the lithics, and research aims of the project all need to be carefully considered before resources are committed to work such as this. In general, the application of usewear or residue analysis to non-contexted lithic tools will be of limited archaeological significance. Similar constraints apply to the analyses of other types of finds, if present. All can yield interesting results, but the integrity and significance of the assemblage or site, and research value of the project, need to be taken into careful consideration.

8.2.6 Illustration: Detailed technical drawings of key lithic artefacts (and other finds) from the assemblage should be produced in accordance with the guidelines in Martingell and Saville 1988.

TABLE 8	Manufacturing Techniques	Chronology	Tool and Site Function	Site Organisation	Wider Connections
Raw Material Types	✓				✓
Raw Material Sources					✓
Knapping Techniques	✓	✓			
Refitting	✓			✓	
Typology	✓	✓	✓		✓
Breakage	✓		✓		
Usewear	✓		✓	✓	✓
Residue Analysis			✓	✓	
Spatial Analysis			✓	✓	

Table 8: The range of specialist lithic analysis that may be used on an excavated assemblage.

9 Assessment and Interpretation

Evaluation of the significance of a site draws on the preceding techniques to interpret the remains and summarise the role of the scatter in local, regional, and national archaeology. This includes information on the archaeological preservation, the nature of the scatter site, its relationship with the surrounding landscape (today and in the past), and other known sites in the vicinity. Other techniques might also come into play here, such as Predictive Modelling which draws upon details of different aspects of the location of similar types of site to predict site densities and locations, among other things. Assessment and interpretation lead to consideration of the significance of a site.

10 Significance and Protection.

Decisions as to the future of the site depend on its significance. The criteria that contribute to the significance of a lithic scatter site have been discussed above (Section 7) and are summarized in the table below (Table 9). In general, no single criteria would be enough for a site to merit protection, it is the combination of factors that is important. Given the archaeological potential of lithic scatter sites, consideration should be given to proactive protective management for significant sites, such as that provided through the national designation system (in this instance scheduling). Avoidance may be deemed advisable wherever a site is judged to be of high significance. While not every scatter site merits active management and protection, those that are locally, regionally or nationally important, and where the archaeological resource value can be determined to be high, should always be regarded as part of the archaeological resource for the future. This means that basic investigation techniques such as those detailed in Section 8.1 should be undertaken as a matter of course when considering the future of any scatter site. Where protection is not possible, or viable, more detailed investigation, including excavation, should be considered for significant scatter sites.

CRITERIA	Notes	Significance
Visible Spatial Differentiation	The existence of discrete spatial concentrations of material across a site suggests less archaeological disturbance.	High Integrity of the Archaeological Resource
Condition of Artefacts	Artefacts with fresh sharp edges and a lack of rolling/sand blasting or other indications of erosion are likely to have been only recently disturbed, suggesting a better-preserved site.	High Integrity of the Archaeological Resource
Preservation of Archaeological Features	Where stratified archaeological features such as hearths or stonework have been preserved <i>in situ</i> , disturbance is likely to be less.	High Integrity of the Archaeological Resource
Well-defined Boundaries	The lack of well-defined boundaries can indicate that increased plough damage has led to destruction of the archaeological resource.	High Integrity of the Archaeological Resource
Unusual Artefactual Material	The presence of rare or unusual types of artefacts. Examples include (but are not limited to) material indicative of a specific period such as the Late Upper Palaeolithic, or specialised collections such as knapping debris, microliths, or scrapers. The recovery of non-local or exotic types of raw material would also be significant.	High Local, Regional, or National, Significance.
Chronological Information	Where a scatter can be dated with confidence it is easier to assess it against the known prehistory of a region. A scatter where stratified features have been preserved may be dated through techniques such as radiocarbon dating (absolute dating), other scatters may be dated through the chronological associations of specific artefact types (relative dating).	High Local, Regional, or National, Significance.
Size	Both large and small scatters can be significant. A larger scatter might indicate a focus of activity over time, or a single significant event. A smaller scatter might represent a specialised site or short-term activity.	High Local, Regional, or National, Significance.
Range of Material	A wide range of material has been argued to represent multi- activity or multi-period sites. Less diversity within an assemblage could result from a more specialised, single period, or single occupation site.	High Local, Regional, or National, Significance.

Table 9: The relationship between individual archaeological criteria, integrity, and significance of the archaeological resource of lithic scatter sites.

11 Archiving

Careful digital and physical archiving of the material and records resulting from the investigation of any scatter site is essential. This includes the finds which should be fully recorded and sealed into secure bags. Museums across the British Isles hold boxes containing finds from poorly recorded scatter sites, and in many cases the bags have perished, or the recorded information is not adequate. In this way a considerable archaeological resource is at risk. It is also important to maintain a record of the movement of finds around researchers or educational establishments. Boxes of material have gone missing, or been recovered with little record about the site, when past practices were lax. It should be noted that the final housing of material from a lithic scatter site is subject to the regulations of Treasure Trove in Scotland under the law of Bona Vacantia (<https://treasuretrovescotland.co.uk/>).

12 Personnel

The techniques deployed for the initial assessment and detailed investigation of a lithic scatter site require specialist archaeological skills and can all be undertaken quickly and easily by a professional unit with relevant experience. Nevertheless, this is not the only appropriate way forward. Community groups also encompass considerable archaeological experience and interest, and in the past the identification and investigation of many lithic scatter sites has been undertaken very successfully by non-professional groups using specialist archaeological advice and expertise to supplement their work. Community groups are often local to an area of potential and there are many advantages to be gained from their involvement, not least regular monitoring of vulnerable areas over longer periods of time. Given the requirement that fieldwalking ideally take place on a repeated basis over a number of years, monitoring of lithic scatter sites becomes difficult within the limitations of mitigation work as usually undertaken by commercial archaeological units. Where time is available, liaison between Local Authority archaeologists, commercial units and community groups could solve this problem.

Where community involvement is possible, the employment of a professional lithic expert, in particular for the rapid lithic assessment, is essential. Lithic analysis is a vital part of the investigation of any scatter site and it is a specialised task. Without it, a lithic assemblage may be of considerable size but it will be of unknown archaeological significance, rendering site management impossible. Field collection without the means for lithic analysis is worthless. The prompt production of lithic results allowed the community group of Mesolithic Deeside to update their fieldwork strategy, liaise with farmers, and maintain team enthusiasm. It also allowed the Local Authority archaeologist to update the HER with the new information, and to start the process of considering future land management options for the sites. After the production of initial results, if detailed investigation is necessary then further involvement of specialist personnel is required, but it is still possible for a community group to take part.



Figure 23: Community groups play an important role in the assessment of Lithic Scatter Sites. Mesolithic Deeside walking a site along the valley of the River Dee, Aberdeenshire.

13 Conclusion

Lithic scatter sites are an important part of the archaeological resource that should not be ignored. The assessment of the significance of a site can be undertaken relatively quickly and easily through the investigation of factors impacting on the archaeological preservation and integrity of the site and of the rarity (or otherwise) of the site in local, regional or national terms. This work can be undertaken by both community archaeology groups and by professional archaeologists. Sites that are judged to be of high significance should be proactively managed and protected.



Figure 24: Lithic Scatter Sites provide a valuable archaeological resource that sheds a light on important aspects of our early prehistory.

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15 Further Information

Archaeological techniques are in a constant state of flux as new techniques are developed, old techniques refined, and redundant techniques discarded. Up to date guidance on appropriate techniques may be obtained from a variety of sources:

- Relevant Historic Environment Scotland staff
<https://www.historicenvironment.scot/>
- A Local Authority archaeologist and colleagues
<https://www.algao.org.uk/>
- Historic Environment Scotland guidance notes
<https://www.historicenvironment.scot/advice-and-support/planning-and-guidance/>
- British Archaeology Jobs Resource (BAJR) guidance notes
<http://www.bajr.org/BAJRread/BAJRGuides.asp>
- The Chartered Institute for Archaeologists
<https://www.archaeologists.net/>
- Specialist Archaeological Consultants
- Specialist Archaeological Companies
- Local Museum Services
- Treasure Trove Scotland
<https://treasuretrovescotland.co.uk/>
- Archaeology Data Service
<https://archaeologydataservice.ac.uk/>
- Scottish Archaeological Research Framework (ScARF) and Regional Research Frameworks where available
<https://www.scottishheritagehub.com/content/423-lithic-scatters>

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