Into the Wildwoods

Explore the Mesolithic in Scotland's native woodlands

"Scotland's landscapes provide us with one of the best opportunities for finding connections between the Mesolithic experience and our own… a direct and intensive engagement with the natural world."

Steven Mithen, *The Mesolithic Experience,* 2004, p. 246

"Scotland's temperate rainforest, also known as Atlantic woodland or the Celtic rainforest, is a unique habitat of ancient and native woodland, open glades, boulders, crags, ravines and river gorges. Dappled by sunlight and dripping with moisture, almost every surface is covered with lichens and other fungi, mosses, liverworts and ferns. The woodlands at the heart of the rainforest are alive with bird song – the wood warbler and the redstart flit through the canopy and the air is filled with insects like the chequered skipper."

***The State of Scotland's Rainforest*, 2019, p. 3**

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Kim Biddulph, Matt Ritchie and Caroline Wickham-Jones

"The eyes are a window to the soul – they help me develop my characters from inception to completion."

Alex Leonard, illustrator and creator of our Mesolithic characters

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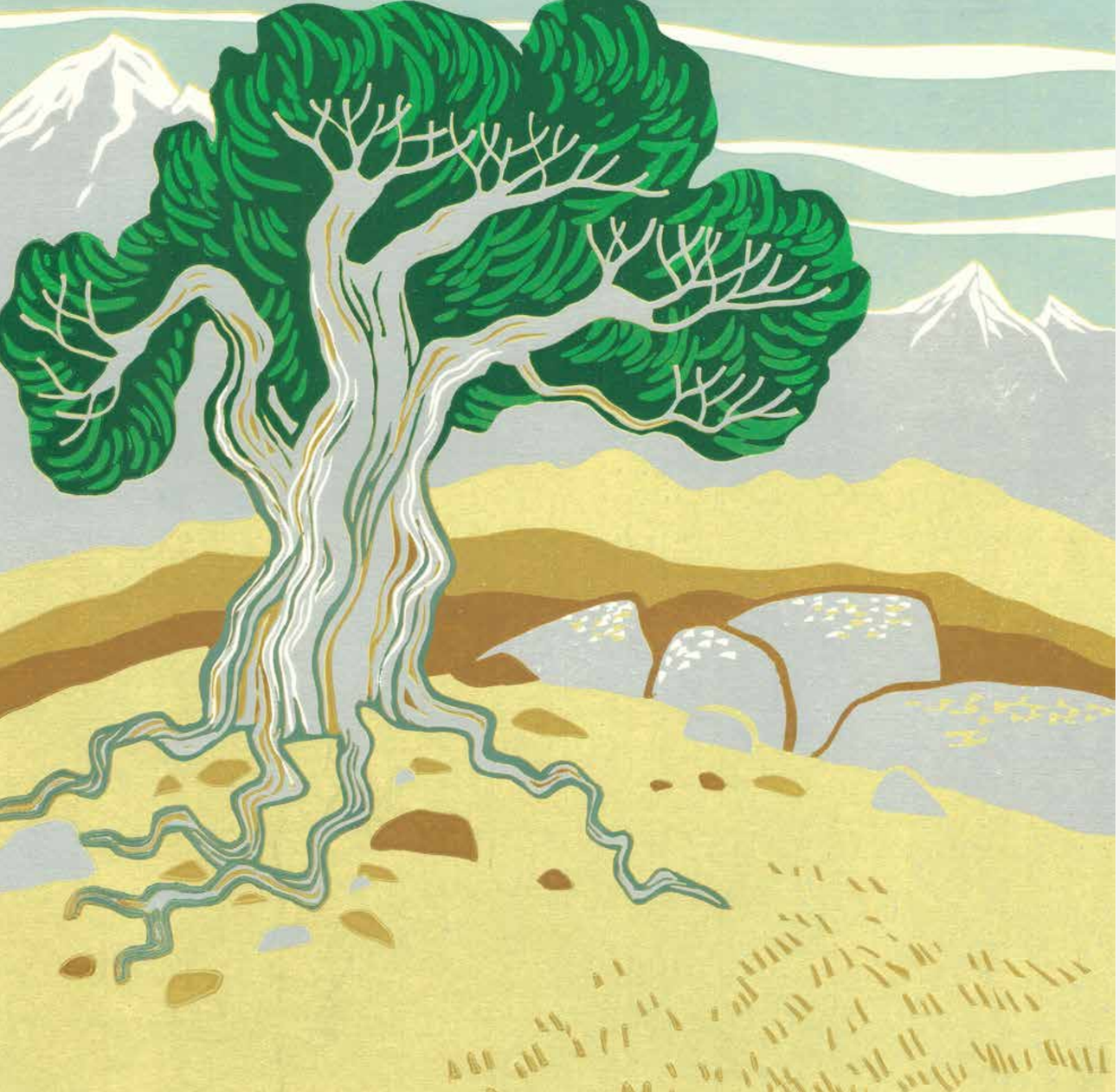
Contents



Introduction

Imagine the world of the wild harvesters, living within the wildwoods of Scotland over six thousand years ago. Our Mesolithic ancestors were at home in their environment, hunting, fishing and gathering enough to survive and prosper. Today, Scotland's landscapes provide the best setting possible for imagining and connecting with the Mesolithic experience. Whether walking through Highland pinewood, or delving deep into Atlantic rainforest, the sights and sounds of our natural world inspire observation and reflection.

A companion to *The First Foresters*, where we met the Neolithic pioneers, living and working within the wildwood, *Into the Wildwoods* uses archaeological evidence and a creative narrative to describe the Mesolithic hunter-gatherers who came before. Our key objective is to explore the interconnected ideas of habitats, natural resources and seasonal change, and to encourage indoor and outdoor learning by thinking about the natural world as a spatial network of integrated ecosystems. We aim to uncover an ancient past that is still accessible today, rooted in an ecological understanding of place and time, and in our human response to both.

This learning resource aims to help teachers and youth group leaders explore the Mesolithic as a classroom topic in line with **Learning for Sustainability**, as the more sustainable lifestyles of the Mesolithic people provide an interesting contrast to our modern ones. It will also support the **One Planet Schools** and **Eco-Schools** initiatives, and provide background information for teachers who are reading the novel *Wolf Brother* by Michelle Paver with their classes. Thinking about how our Mesolithic ancestors understood the complex habitats and ecosystems within which they hunted and gathered – adapting to and sustaining life within very human habitats – can help us understand our own place within the natural world.

The period we're going to study spans 4000 years or about 160 generations, from around 8000 BC to around 4000 BC. It's an almost unimaginable length of time. But it's important to grasp the huge scale of the Mesolithic period. Use the timeline in our *Outdoor Archaeological Learning* booklet to set the scene and place the Mesolithic in its chronological context. Following the end of the last Ice Age and over the course of four thousand years, the environment and climate of Scotland changed from cold tundra to a diverse mosaic of rich habitats, dominated by dense woodlands. To reflect this, our narrative is set within the later Mesolithic period (c. 5800 – 4000 BC).

Mesolithic people may not have had maps in the modern sense, but they did think spatially, planning their activities in order to best move through their landscape, gathering and exploiting seasonal resources. Today, Forestry and Land Scotland takes an **ecosystem approach** to sustainable land management within Scotland's national forests and land. This helps us to recognise and sustain the benefits provided by our natural resources and support the delivery of a range of economic and social objectives. Our Planning Foresters think spatially over the long term, considering a wide range of factors. They use Geographic Information Systems (GIS) to map their decisions, planning tree planting, forest management and timber harvesting operations many years in advance. Using the ecosystem approach, we can explore and imagine the Mesolithic natural world as a very human habitat, developing an understanding of interlinked natural resources, ecosystem services, seasonality and habitat connectivity to inform a series of mapping activities.

Taken together – an understanding of Mesolithic lifecycles and an appreciation of the ecosystem approach – learners can develop skills and knowledge in regard to today's environment and their own responses to it. Here we present the background information required to integrate the Mesolithic as a topic across a range of subjects – from place-based ecological outdoor learning to using map making in geography and art and design. To facilitate this, some sections should be considered background information for teachers, to help them understand the topic or to understand the activities (**The Mesolithic Environment** / **The Ecosystem Approach**), while other sections could be read by the learners themselves (**The Mesolithic Year** / **Very Human Habitats**). The activity (**Mapping the Mesolithic**) involves lots of writing, drawing and thinking, alongside discussion of ancient lifecycles and an exploration of our own. The activitiy is most suitable for pupils at *Curriculum for Excellence* Level 2, but may be adapted for those working at Level 3.

"Archaeology is the study of the human past through its material remains. Through archaeological research and analysis of our places, artefacts and ecofacts, everyone can explore, better understand, value and care about the prehistory and history of Scotland's people, culture and landscape."

***Scotland's Archaeology Strategy*, 2015**

In engaging pupils in outdoor learning and conducting meaningful research within the classroom, archaeological learning can provide real and cohesive links across a range of curricular areas. Exploring the spiritual aspects of past societies and belief systems can support learning in **Religious and Moral Education**. Creative map making and writing can help confirm learning and understanding and benefit both the **Expressive Arts** and **Languages and Literacy. The process of exploring the woodland environment itself can contribute** to outcomes in **Health and Wellbeing**.

Quotes and short features have been spread throughout the text from archaeologists, foresters and ecologists, to help make some of the key ideas more accessible, and to link to the varoius careers represented, recognising the aims of the **Developing the Young Workforce** initiative.

The Nature of the Evidence

"The search for the Mesolithic relies on sieves, microscopes and the sharpest eyes to find a people who seem identifiable always and only by the tiniest clues."

Neil Oliver, *A History of Ancient Britain*, 2011, p. 41

The term 'Mesolithic' refers to 'Middle Stone Age', a subdivision of the earliest age of Christian Thomsen's Three Age System. Thomsen was the curator of Denmark's National Museum in Copenhagen. At its opening in 1819, Thomsen displayed the tools and artefacts according to his new model of three successive stages of technology: *Stone Age*, *Bronze Age* and *Iron Age*. The longest period, the *Stone Age*, was later subdivided into the *Palaeolithic* (Old), *Mesolithic* (Middle) and *Neolithic* (New).

The word 'Mesolithic' is now just a term of reference, a reflection that things made of stone last the longest. The true Mesolithic toolkit included items made of animal skin, bone, fur, gut, sinew, horn, teeth and antler, not to mention wood, bark and plant fibre. Such items are only rarely found by archaeologists so long after they were made, and usually only if preserved in waterlogged conditions. So the evidence for Mesolithic life usually takes the form of scatters of stone artefacts, ecofacts preserved in rubbish heaps (known as midden deposits) and peat cores.

Mesolithic occupation sites are usually found where either chance discovery or systematic research has identified a scatter of typical stone tools such as microliths. The microlith is the iconic artefact of the Mesolithic – tiny pieces of carefully and skilfully worked flint that were used as sharp points and barbs. Often less than 20 mm long, microliths are made by shaping the edges of struck stone pieces (usually of flint or chert) to form a range of geometric points, such as scalene triangles, triangles and crescents.

Microliths were then set in groups into wood, bone or antler hafts using a mixture of beeswax, crushed charred wood and pine resin or birch tar, to make knives, arrowheads and other tools. Archaeologist Neil Oliver describes microliths as “the tiniest, most insignificant-seeming finds imaginable” but including “beautiful finely-flaked blades of flint, that would have been put to all manner of uses in hunting, the preparation of food, cleaning and shaping animal skins and making other tools” (*A History of Ancient Britain*, 2011, p. 41).

When readers first visit the Raven Camp in *Wolf Brother* (Michelle Paver, 2004, Chapter 8), we see an older woman busy making arrows using tiny microlithic points. Other stone tools included scrapers for working wood, hide and bone and sharper blades for skinning and cutting; the description of Torak processing the deer he kills is a good example of how different tools were used (Chapter 6). Such implements were fashioned in a matter of minutes and large quantities of stone debris are created by flint-knapping in the course of a few hours (this is just the sort of scatter the archaeologist looks out for). Making tools would have been an important life skill and archaeologists have even identified the efforts of beginners, probably children, learning to work stone; Torak tells Renn that he has not yet learnt how to knap flint because his hands aren’t yet strong enough (Chapter 18).

“The trees opened into a clearing. Torak smelt pine-smoke and fresh blood. He saw four big reindeer-hide shelters unlike any he’d ever seen and a bewildering number of people. On the riverbank two men were skinning a boar strung from a tree. In the shallows two girls in buckskin tunics rinsed the boar’s guts, while three small children solemnly made mud-cakes. Two sleek hide canoes were drawn up out of the water. The ground around them glittered with fish scales. A couple of large dogs prowled for scraps. In the middle of the clearing, near a pinewood long-fire, a group of women sat on willow-branch mats, talking quietly as they shelled hazelnuts and picked over a basket of juniper berries. A little apart from them, an old woman was heading arrows, slotting needle-fine flakes of flint into the shafts. By the fire, a pretty girl leaned over a cooking-skin. Steam crinkled her hair as she used a forked stick to drop in red hot stones. Near her, an older man knelt to spit a couple of hares.”

Michelle Paver, *Wolf Brother*, Chapter 8 (edited extract)

Unfortunately, archaeologists rarely find the structural remains of camps, tepees or shelters, although traces of post holes do survive where they once stood. The camps of our characters Nesa and Yasen of the lowland broadleaf woodland people, Ola and Niko of the estuarine people, and Pihla and Oihana of the highland pinewood people, are based on only a few excavated sites (including East Barns and Echline Fields in Scotland, Mount Sandel in Northern Ireland and Star Carr and Howick in northern England). More common discoveries are traces of hearths or fire spots sometimes associated with groups of stake-holes, posts and pits used for cooking and storage. Caves and rock-shelters would also have been important but few have been excavated. But Mesolithic camps were rarely occupied for long, as groups moved through the landscape, gathering and exploiting seasonal resources. Rare traces of these movements have been found preserved as footprints in coastal and estuarine muds, such as in Formby in Lancashire, Port Eynon in Gower, Low Hauxley in Northumberland and at Goldcliffe on the River Severn, where children accompanied adults on what was presumably a foraging expedition, or to check fish traps.

“People returned to exactly the same spot year after year, perhaps generation after generation, to gather and eat mussels, limpets, dog-whelks, periwinkles and the like, before adding them to the midden, in time a great white pile of shells.”

Neil Oliver, *A History of Ancient Britain*, 2011, p. 46

Shellfish were collected from the shoreline and eaten in huge quantities over many years, and the discarded shells formed great mounds known today as ‘shell middens’. In the way that the microlith is the iconic artefact of the Mesolithic, the shell midden is one of its iconic site types. In Scotland, the most famous shell middens are found on the Hebridean island of Oronsay. Although they are mainly composed of rubbish, archaeologists always like to find middens because they can tell us so much about life in the past. Shell middens also often contain bones from any fish, birds and mammals that may have been eaten, and they provide the perfect environment to preserve bone tools, antler implements like harpoons for hunting and mattocks used for digging, as well as shell artefacts such as perforated cowrie shell beads. Our characters Plamen and Kaarup of the coastal Atlantic rainforest people are finding and cooking shellfish, and Eglay and Derya of the coastal birchwood people are catching fish and collecting birds eggs, the bones and shells of which will be added to their shell middens.

Evidence about the past environment of Mesolithic Scotland comes from the analysis of peat cores. Trapped within the sediments of the cores are many clues to the past environment and vegetation cover including pollen grains and tiny microfossils of insects and plant fragments. Pollen grains are extremely small – about a hundredth of a millimetre across, much smaller than a grain of sand – but they are extremely tough and can resist decay for thousands of years. They are also unique – each plant species produces its own distinctive grain. As a peat bog forms, or sediment is laid down within a lake or pond, pollen grains from plants that live nearby become trapped in the layers.

As a rough guide, up to one meter of peat can accumulate over a thousand year period. Sampling and studying the pollen archive from the various layers in the peat – with the earliest layers at the bottom and the most recent layers at the top – allow us to build a picture of the changing vegetation cover on and around the bog. Similarly, the different microfossils – remains of ancient insects and other tiny creatures – can all be studied to provide information on changing conditions such as air temperature and even rainfall. In many parts of Scotland, over seven metres of peat has accumulated – in some cases forming an unbroken environmental record charting our changing landscape since the end of the last Ice Age.

A peat core. © AOC Archaeology

Searching for Clues

ARCHAEOLOGIST CAROLINE WICKHAM-JONES DESCRIBES HER EXPERIENCE OF FINDING AND EXCAVATING MESOLITHIC SITES

"Mesolithic sites rarely make glamorous excavations. All too often they seem to comprise a corner of a muddy field where there is little to be seen except for a strange pattern of discolourations in the subsoil, and possibly some scatters of broken stone. But finding a Mesolithic settlement or activity site is tremendously exciting, and I spent much of my early career crouching down to pick up and investigate the clues left behind.

We could come across a site during archaeological fieldwalking, when someone notices a spread of characteristic microliths in the surface of a ploughed field. Other sites may be discovered by a farmer, or local dog walkers may spot flints eroding out of sand dunes or at the edge of a loch or river. The ploughsoil will then be carefully peeled back, perhaps with the aid of a small mechanical digger, and a sample of the sediments will be sieved in order to identify and remove the precious fragments of worked flint and stone that indicate Mesolithic activity. Working to remove the bottom of the ploughsoil will take place by hand, using a trowel to clean the surface of the subsoil and expose the marks of pits and post holes.

Once down into these *in situ* remains, excavation takes place more slowly. Surfaces have to be carefully cleaned and small finds of flint or other stone are recorded in place before they are bagged and sent to the finds hut for packing and further analysis. Excavation like this allows the locations of post holes, pits, hearths and other features to be recorded and planned so that it is possible to work out the original positions of huts or shelters.

The soil that fills these features is carefully sampled and sieved so that the process of unpicking everyday life in the Mesolithic can begin. *Fills* like this may contain traces of pollen, insects, and other matter that provide vital clues to things like local vegetation and the environment.

But excavation is only the first part of a long process of analysis by many different specialists. Stone tools can be examined for information relating to the raw material, manufacturing techniques, types of tools made and even the uses to which those tools were put. Everything adds to the picture of Mesolithic life. It is rare to find traces of organic material on a Mesolithic site, but charcoal and carbonized nutshell can survive. These can help with dating the site using radiocarbon dating, as well as with the investigation of local woodland and plants. It is really interesting to see how people made use of the resources available to them.

Careful record keeping allows the full detail of the excavated site to be reconstructed, but for every month of fieldwork, it may be several years before the results of the investigation are ready to be published. Excavation still continues around the country, and every new site reveals exciting new detail about Mesolithic life."

◄ **A repeating sequence of microliths, scrappers and a core (top left) in assorted flint, mudstone and chert, recovered by archaeological excavation during the construction of the Queensferry Crossing.**
Created using drawings by Headland Archaeology

The Mesolithic Experience

"When the cold of the last Ice Age finally began to withdraw eleven and a half millennia ago, Scotland was left a bare tundra bereft of both trees and people. Gradually, over the next four millennia, first birch then hazel, next pine, oak, and elm, and ultimately alder clothed the land."

TC Smout, *People and Woods in Scotland*, 2003, p. 1

As the glaciers and tundra retreated, our Mesolithic ancestors could expand their homelands by following the migrating herds of reindeer further afield and exploring the emerging coastlines. Gradually, they adapted to a new world. They shifted from a diet focussed on reindeer meat and wild horse to one as diverse as the habitats they occupied, each ecological zone rich in varied seasonal resources. Woods and forests gradually grew to cover most of northern Europe. New coastlines emerged, rich in shellfish, seals, and sea birds. The people who moved into and through these landscapes made great use of the coasts and rivers. Today, we describe them as 'hunter-gatherers' because they were skilled at hunting, fishing and gathering plants, nuts and berries. They were always on the move, making use of seasonal resources, sometimes coming together in large groups or communities and sometimes staying in smaller family groups. They made use of nature to make their tools and clothes and camped each night in temporary shelters.

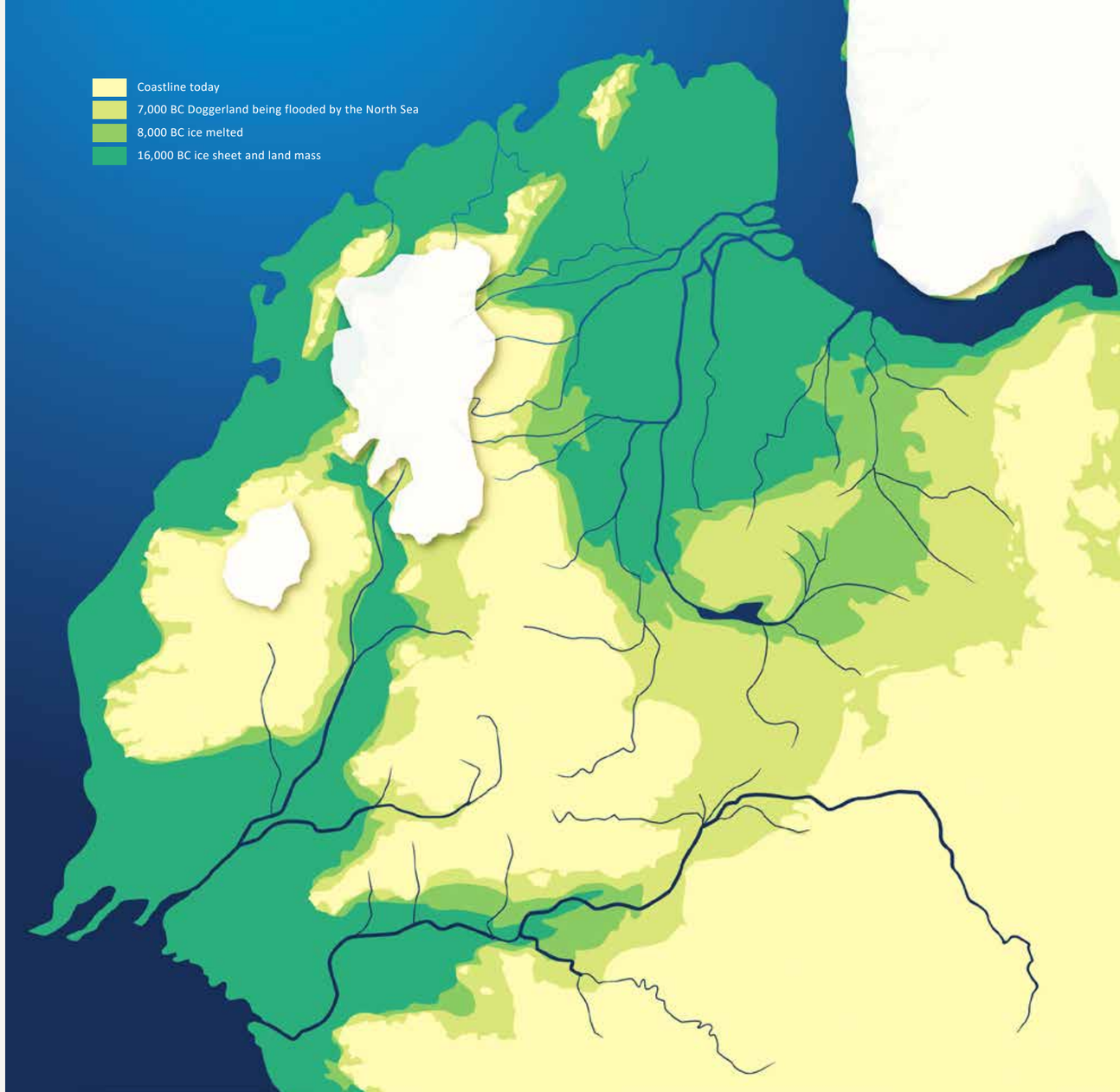
Pollen sequences and ice core data have allowed climate scientists to model three distinct phases within this post-glacial Holocene period in Scotland: the Preboreal (c. 9600 – 8800 BC), a cold, dry period; the Boreal (c. 8800 – 5800 BC), a warm, dry period; and the Atlantic (c. 5800 – 4000 BC), a warm, wet period. The gradually improving climate over the long term brought changes in vegetation – from open scrubby tundra in the 10th millennium BC to closed canopy woodland in the 5th millennium BC, a huge expanse of wildwood containing and neighbouring an extraordinarily diverse mosaic of different habitats. The dense woodland joined open uplands, wide, meandering river valleys, broad estuaries and intertidal coastlines. This learning resource is set within the later Atlantic period.

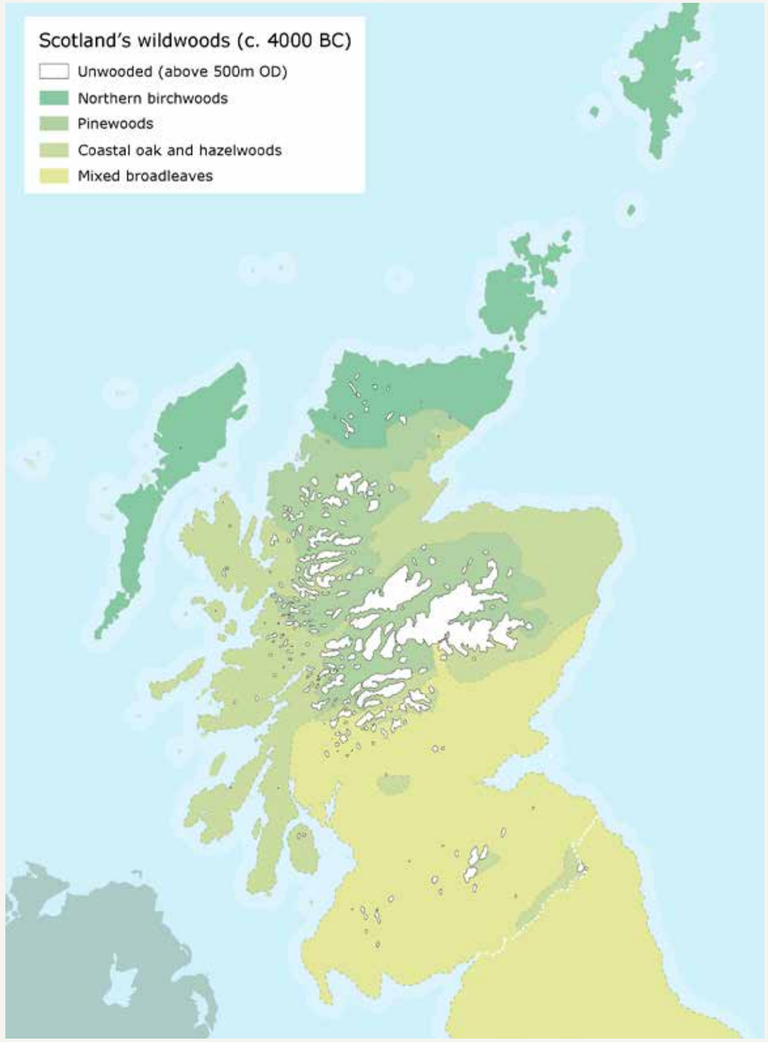
Sea level change

The great ice sheets that once covered Scotland had an important role in shaping our current landscape. Glaciers carved our mountains, shaped our glens and created our soils – and, when the ice retreated after the Ice Age, the very height of our landscape changed.

To imagine the weight of the ice sheet over Scotland, place your left hand on the table and press down. Your hand is covering Scotland – and the greatest pressure is under the heel of your palm. The build-up of ice over Scotland depressed the level of the earth's crust. The ice was at its thickest over mountains of the west coast. The weight forced the land down – and when the ice retreated the land sprang back, with the greatest gains being where the ice was once at its thickest. Slowly pull your hand away from the table leaving your fingers in place and imagine the table returning to its original shape.

This process is known as *isostatic rebound* – and it was accompanied (at a different rate) by rising global sea levels as the ice melted. At the end of the last Ice Age, the southern half of the North Sea was dry land (the area now known as Doggerland). Rising sea levels finally flooded the landscape here about 8,500 years ago. Both isostatic rebound and sea level rise contributed to a changing Scottish coastline. Coasts that were far from the centre of isostatic rebound tended to see land gradually submerge under the rising sea; while coasts that were close to the centre of isostatic rebound saw changing relative sea levels, with coastlines slowly rising to a post-glacial maximum before gradually regressing. In some areas of the west coast of Scotland raised beaches can be seen – relict Mesolithic coastlines now above present sea level.





Wild harvesters

"Torak thought of the golden birch and the scarlet rowan, and the brilliant green oaks. He thought of the teeming prey; of the lakes and rivers full of fish; of all the different kinds of wood and bark and stone that were there for the taking if you knew where to look. The forest had everything you could ever want…"

Michelle Paver, *Wolf Brother*, 2004, p. 103

Unfortunately, forests and woodlands are not actually very good places to find food. Berries and nuts tend to be found on the tree species of the woodland edge, and seldom on canopy trees (bar the sweet chestnuts in today's woods). The few edible roots that exist belong to grassland and edge habitats. Edible leaves occur much more commonly out of the forest than within it. Fungi can be collected in abundance, but appear irregularly and can be treacherous. The main source of food within the woodland is game – but woodland habitats support far fewer large animals than open ground. In describing the hunter-gatherer lifestyle, archaeologist Barry Cunliffe wrote that "adaptation to the forest environment required human communities to maximise their use of plant resources to augment the sparsely distributed animals, and to adopt a storage regime, creating stocks of nuts, dried berries and grasses, smoked fish and the like, which could tide the group over the lean months of winter" (*Europe Between the Oceans*, 2008, p. 69)

"If you sat down to eat a bowlful of hazelnuts, you manage about twelve or maybe twenty if you're lucky. Then your mouth dries up and it's difficult to eat any more. But when you cook them [they were roasted in shallow pits] they are transformed. All of a sudden a dry resource that is difficult to digest becomes an easily-digested potato-like food, and you can sit and eat two hundred without any difficulty at all – and hazelnuts, once cooked, preserve really well."

Ray Mears, *Wild Food*, 2007 p. 16

Along with wood charcoal, burnt hazelnut shells are common finds from Mesolithic sites, and nuts would have been an important foodstuff. Other burnt plant foods such as wild raspberry seeds, acorn husks, crab apples and plant tubers and roots all confirm extensive plant gathering. When traces of Mesolithic occupation are found during archaeological excavation,

archaeobotanical evidence can be recovered by taking bulk soil samples. These are then washed and sieved – with organic matter floating to the top ready for collection and study under the microscope. Archaeologists Rosie Bishop, Mike Church and Peter Rowley-Conwy analysed the results from excavations of Mesolithic occupation sites from across Scotland, looking for evidence of the gathering, processing and cooking of wild plants. They found definite evidence of hazelnuts, lesser celandine root tubers, seaweed, fruits and berries, and edible seeds, confirming that "plants were key resources within Scottish Mesolithic subsistence strategies… and it is likely that a much greater range of plants was exploited by hunter-gatherers than has been identified archaeologically" (*Seeds, fruits and nuts in the Scottish Mesolithic in Proceedings of the Society of Antiquaries of Scotland* 143, 2013 p. 56).

Riverine resources such as salmon, trout and eel would have been important – and animals such as deer, aurochs (a type of wild cattle now extinct), wild boar and predators like bear, lynx and wolf would have provided skins and furs as well as meat. Bone was also an important resource for tool making – nothing was wasted. It is likely that smaller animals, birds and fish were caught using traps and snares, and they would have been an important part of the diet, although their fragile bones have left less evidence. People explored and moved around the inland waterways using canoes, coracles or maybe even reed rafts – and they walked alongside the burns and along animal tracks through the forest and up into the mountains.

We know very little of Mesolithic people's culture and society, but they probably shared many traits found in modern hunter-gatherer groups: an ethos of sharing resources, and beliefs that were shaped by an intimate relationship with and respect for the natural world. Many traditional foraging societies today have strong notions of the cultural fluidity between people and animals, and this may well have been the case in the Mesolithic. People are likely to have lived in extended family groups and held periodic larger gatherings. Estimating the number and composition of groups is challenging and we know very little about their society, rituals or how they treated their dead.

As people moved into the land, the mountains, valleys and seascapes of Scotland will have become inscribed with cultural values, built on the experience of past generations and undoubtedly rich in stories, memory and meaning. We dwell in a similar 'memory-scape' today, although for many of us it is more urban and very personal. Our understanding of Mesolithic culture and society is limited, but imagining the Mesolithic experience and their relationship with the natural world can be useful to help us understand our own associations with place and the environment around us.

Glen Loy Pinewood. © John MacPherson ►

Under the Microscope

PALAEOECOLOGIST SCOTT TIMPANY DESCRIBES HIS WORK INVESTIGATING AND RECONSTRUCTING ANCIENT HABITATS

"I first became interested in past landscapes at university, where I was introduced to pollen analysis and how it could be used to reconstruct the Mesolithic Wildwood. I am interested in not only identifying the types of trees that formed the canopy, but also in the ground flora and mosaic nature of woodlands in the landscape – finding out about the different character of the woodland in different places.

My first job is to collect stratified samples to study in the laboratory. The type of deposits I sample determine the sampling method I use. In soft sediments (such as peatlands and lochs) I use a russian auger with a closed chamber to extract 0.5m core samples in an overlapping sequence. I can use this to go as deep into the peat or loch silts as I have the number of rods. The deepest core I have taken so far reached 11m down. In harder sediment (such as intertidal peats that have been compacted and, in the case of submerged forest sites, are full of waterlogged wood), I dig a test pit into the ground and extract samples with a small metal monolith tin.

I clean and record a section of the exposed peat and then force the rectangular tins into the section, again in an overlapping sequence to make sure I get the whole sediment deposit in my samples. Once the tins are recorded onto the section drawing, I dig them out of the peat. The deepest I've ever dug a test pit in the intertidal zone was over 2m down – and that was hard work! If I'm sampling for beetle remains, I take 10 litre samples of peat down through the peat at intervals of 0.1m (you need much larger samples for insect recovery than you do for pollen). Once the samples are taken they are wrapped, labelled and taken back to the lab to record in detail and sub-sampled for pollen and other waterlogged plant remains (such as seeds and buds).

In order to reconstruct these ancient woodlands and bring them back to life I use range of different palaeoecological techniques. Pollen is an incredibly useful tool for reconstructing these former woodlands, as all flowering plants (including trees) produce pollen grains that are unique to their species. I also look at waterlogged plant remains, including ancient seeds preserved in the peat or silt. Beetles can also be used to gain further information – not only on past ecology (as certain beetles need certain ecological niches), but also on what the temperature may have been (as certain beetles are temperature-sensitive). I will also examine fungal spores (as certain dung fungi will indicate the presence of certain animals in the woodland). Environmental DNA is a technique that is becoming more and more accessible to palaeoecologists. In the future we may soon be looking for the presence of animal dung routinely using this method, together with examining the plant DNA.

Although the collection of a pollen core may only take a day, the analysis takes months of looking down a microscope. It is a slow process but extremely rewarding. Being able to look through my microscope and find a woodland landscape that existed thousands of years ago is amazing – almost as good as time travel!"

◄ **A grain of Scots pine pollen.** © Science Photo Library

The Mesolithic Year

The inhabitants of Mesolithic Scotland were *naturalists* by necessity. Without the easy run to the shops or supermarket, they had to provide for all their needs themselves. While we worry about the air-miles of our food and make use of goods brought in from around the world, they had to rely on what they could find around them. However, there was plenty of food and resources to be found for those with the knowledge and understanding to harvest them.

Today, we are used to the home comforts of central heating, hot water, sophisticated bathrooms and kitchens, and the convenience of shops that can provide for our every need. We have little idea of the processes behind the generation of electricity, the production of our foodstuffs, or the building of our houses, and most of us certainly do not possess the knowhow to create these for ourselves. It is hard for us to imagine a world in which these 'essentials' did not exist and where individuals provided for themselves. We have lost some of the links to nature that were once a fundamental element of life. Many of us only notice the passing of the seasons as a backdrop against which life is played out, and we have forgotten the way in which it once ruled our daily routines.

Where we have become accustomed to the diversity of the supermarket, our Mesolithic ancestors had the diversity of the world around them. There are many edible plants in Britain, most of which we do not eat today. In the past, these could provide a diet that was rich in flavour, variety and, in many cases, worked to promote the health of the community. Many different elements of plants could be eaten, from leaves, buds and flowers, to fruit, roots and tubers. To the plant foods they could add meat from animals, fish, and birds, as well as other sources of protein such as eggs and shellfish.

Food was but one concern and it is important not to prioritise it in the way to which we are accustomed. Without the exchange economy that we make use of in order to fulfil our wider needs, people had to provide everything for themselves. We can buy goods ready-made, and this reduces the time, and skills, needed to organise basic necessities. The Mesolithic community not only had to make items such as clothes and basketry, they had to obtain the raw materials. Hides had to be prepared, fat to be rendered, birch bark to be stripped and bone to be cleaned. Only then could people set about making clothes, containers and hafts. Many skills went into the preparation for a successful hunt, but a single animal, such as a red deer or a seal, provided a great diversity of raw materials. Everything was put to good use and nothing was wasted.

But we need to be careful of underestimating the hardships involved. There was hard work and skill involved in making sure that everyone had enough food and the right resources for survival. Individuals were only a heartbeat away from disaster and they knew it. A sudden accident – a foot placed wrongly or a wild boar that charged unpredictably – could lead to disaster. The onset of illness or food poisoning could restrict the abilities of your best gatherers. A severe winter storm could stop you from leaving camp for many days; or a cold and wet summer would reduce the availability of fruits and berries and limit the condition of the animals. It is no wonder that people understood themselves to be part of a greater whole in a way that we find quite alien today.

Rather than looking for ways to survive by taking from the world around them, the early inhabitants of Scotland were equally aware of the needs of their fellow creatures, including the trees and plants from which they drew sustenance. The renewal of spring is important for the survival of all, and people were very aware of the web of life. They understood that they were part of a greater whole and they may well not have differentiated between their 'humanity' and the 'humanity' of the animals and plants around them.

Spring renewal

We can't be sure when the start of the Mesolithic Year took place, but it is likely to have coincided with the time that we now know as spring. The return of the sun for longer periods in the sky, the advent of warmer days, the thawing of snowy landscapes, and the coming of new life as buds and shoots appeared throughout the land; all of these signalled that the winter darkness and cold were safely past and the world was preparing for the onset of a new year. All that was needed for the regeneration of life would soon be present. This would have been an important time for those whose spirituality encompassed the wider world.

It is hard to over-estimate the emotional impact of the arrival of spring for the early communities of Scotland. As the sun rose higher in the sky and the days grew longer and warmer, so people were filled with hope and optimism for the future. Thoughts of wider connections, new adventures, and old friends could resurface. We can still relate to this today when we find ourselves planning summer travels and family get-togethers.

Early on in the season, after the equinox, the days would start to lengthen, and this would be particularly noticeable for those in the north where there could be as much as two and a half hours of additional daylight by the end of March. For those on the coast, the equinox also brought particularly low tides, a great opportunity to harvest shellfish and other resources from the shore.

People would be on the lookout for the appearance of new buds on trees and shrubs, and they would watch for mating behaviour in birds and animals and seek the return of migratory species to well-known haunts.

A wide range of plants would soon appear to dispel the restrictions of the winter diet. Many folk today still value the fragrancy of wild garlic, but that is only one of a range of herbs and greens that can be used at this time: young nettles and sorrel are still eaten by some, and our Mesolithic ancestors were aware of a much greater range of edible plants. Towards the end of the season, there would be new berries like wild strawberries and flowers like elder to add to the diet.

The earliest changes would be apparent within the coastal Atlantic rainforest, where warmer, sheltered environments would quickly be carpeted with bluebells and primroses – still a welcome herald of spring today. As fresh green shoots burst forth on the trees, a chorus of birdsong would announce mating behaviour and the construction of nests, and young animals would gradually appear. Up in the highland pinewoods, winter would linger longer and colder conditions might lead to continuing patchy snow cover. Communities are likely to have favoured lower camp sites at this time of year, in order to make the most of precious new resources as they appeared. Those who overwintered inland, or in the uplands, would need carefully preserved supplies in order to see them through the longer winter period.

As the year progressed, so the hunt became more abundant, and nesting birds provided eggs. Warming waters brought more fish to the shore, and there would be salmon, mackerel, crab and lobster in increasing numbers. Some species such as salmon would start to make their way up the rivers. Gradually, even those in the uplands would benefit from the improving conditions. Communities spread out, keen to make the most of the new resources that were appearing and allow the locations that had nurtured them through the winter to recover.

Travel required a certain amount of organisation. Even for a community well-used to regular upheaval there were many goods to be packed and moved: spare clothes and perhaps rolls of hide from which to repair shelters and clothing; baskets and bark containers, some containing food; sleeping skins; tools of antler, bone and wood; choice nodules of flint and bags of arrowheads and blades; bows, arrows and harpoons: the tools of the hunt. No wonder many groups made use of river transport, although at this time of year the increased water in our larger rivers could make this a risky business for those who ventured along them in hide covered coracles and boats. Others preferred log boats, although these too required a skilled navigator. There was also the possibility of catching fish along the way.

Summer warmth

After the awakening of the spring, the arrival of swallows and swifts was a clear sign that summer was on its way. Longer days and warmer weather heralded increased fruitfulness and the opportunity for relaxation. Communities that had split into smaller groups in order to maximise the likelihood of surviving a harsh winter could think about meeting up once more. There would be friends and relations to catch up with and news to share.

Some groups might spread out to access places that had been exposed and inhospitable over winter. Journeys now were more likely to be undertaken across the land as travelling conditions improved and smaller groups moved into places that had been less hospitable through the winter. Packing up the camp site was a well-organised process that children became accustomed to from birth. Everyone had their job, and everything had its place. It was important to ensure that nothing would be missing when packs were unrolled at their destination. Many communities also adhered to strict ways for leaving the old camp sites. It was important that they be ready to receive their next inhabitants, whether they were to be empty for just a few days, or for several months.

On arrival at a new site people quickly sprang into action to set up house. In some places, huts might be ready and waiting, needing just basic repairs. In others the framework had been carefully dismantled and stored. Sometimes it was necessary to build from scratch. Thick bundles of grasses and similar warm material would be gathered for flooring, and coverings unrolled or procured. Some would go off to gather fuel, others would clear out old hearths. Even the smallest of children would have a task, and many would appreciate the familiarity of revisiting well-loved locations.

The community could divide in many different ways other than by traditional family relationships. Small bands, perhaps of young adults, might travel to the uplands in order to hunt, gather upland berries, and seek for exposures of useful rock from which to make sharp stone blades and arrowheads. On warmer days they were, no doubt, plagued by insects, just as we are today. Perhaps they dropped down to the rivers and larger lakes to seek a breeze, fish or spend time in lower broadleaf woodlands gathering plants such as birch, willow and hazel for basketry and other needs.

Along the shore the raucous cries of cliff-nesting birds had already announced the return of warmer days and greater rewards for the hunters. Some groups would set out, and besides the hunting there would be fish traps to repair, and other materials to collect and prepare. There was nearly always a supply of useful stone and wood brought in by a high tide.

Improving weather conditions allowed the group to venture further out to sea, perhaps visiting offshore islands, or across wide estuaries. As the diversity of life increased, so this became an important time to stock up on resources. In addition to fish and shellfish, there were the birds of sea and shore. The coast provides a variety of habitats from salt marsh and reed beds to cliff tops, rocky headlands, and stands of birch and other woods. Each has its own rewards, but each also requires distinctive knowledge and hunting techniques. Marine mammals, such as seals, were another important source of food, and useful for so much more than meat and hide. Blubber provided an important source of fat; it could be used for light and food, but was also a vital component of successful kayaking. Hide boats such as sealskin kayaks required frequent applications of seal oil in order to keep them waterproof. It would have been foolish to venture far without a supply of the oil necessary to keep your boat seaworthy.

A coastal group might be large and contain a mix of age and ability. Once settled, smaller parties could break away to undertake specialised tasks. While stronger hunters set out to hunt for seals on a nearby island, those with the particular ability to move silently could venture out across the reed beds in search of coastal wading birds, and older folk might take small children to collect shellfish from rocks and rock pools as the tide withdrew. Children learnt from accompanying the adults, and there was always a useful task which could be turned into a lesson.

Towards the end of the season, in a good year, there would be great variety and a glut of foodstuffs. The first nuts would ripen. Fruits and berries, fungi, wild grasses and tubers; individual communities knew their land well and frequented particular locations for favourite foods. Along the shore there were fish and crustacea, shellfish and marine mammals, while hunting inland offered potentially rich rewards.

Autumn harvests

Autumn was a time of particular importance for Scotland's early settlers. After a season of growth in the summer warmth there was a variety of foodstuffs to be harvested, while the lingering presence of the sun provided the opportunity for relaxation and enjoyment. This was particularly important to communities who rarely escaped the need to keep an eye out for resources, whether for the next meal or as raw materials for warmth, shelter and tools. There was also the opportunity for social time and community get-togethers. When you spend much of your time in small groups, whether family or peer groups, it is good to meet with others. At times like this you can learn new skills, find out about new lands, explore different stories, and forge alliances.

Some gatherings no doubt took place around carefully organised events. Foods could be collected, prepared and stored. Fuel was gathered, a suitable meeting place arranged, and word went out. A lakeside strand or the wooded shore of a major river provided a good central place to which people could travel easily, set up camp, and find the basic necessities of life: food, fuel, water and shelter. Those with a particular skill collected examples of their handicraft for exchange or to impress potential friends. Other gatherings were more impromptu. A stranded whale required many people to butcher and prepare the meat, blubber, bone and skin for further use. But it also supplied a wonderful opportunity to come together. Sometimes the wider community met to achieve a task, the building of a new fish trap across an estuary perhaps, sometimes they met just to have fun.

In late autumn many communities started to fragment into smaller groups, in preparation for winter. At this time of year fuel became of particular importance. Whereas we tend to see one thing only, wood, the Mesolithic community would be very aware of the different properties of different trees. Logs had to be collected appropriately, depending on your needs: slow burning fuel to see you through the night; hot fuel for cooking; damp smoky fuel to dry meat. The forest was a resource that provided for many different needs.

As the season of abundance, autumn provided the opportunity to eat well and store up body fat to help you keep warm and survive the leaner winter months. The hunter-gatherer diet is, in general, a very lean diet. Wild meats are low in fat, berries and fruits the same. Without the benefits of central heating and thermally efficient clothing, people burnt through many more calories than we do just keeping alive. As the weather grew colder, they fell back on more calorific foods, such as nuts or oily fish and blubber, in order to build up the body mass to see them through the coming months of cold and darkness. Autumnal honey provided a sweet, welcome source of calories for the winter.

The whole community worked together to find the foods and other resources that would see them through the winter. While experienced, active hunters set out for the larger mammals that would supply hides and other materials as well as meat, even the smallest children could help to gather berries and nuts, learning, at the same time, what was safe to eat. Some might set traps for smaller mammals and birds. Older, and less able members of the community worked in camp to process and prepare the foodstuffs and other resources as they came in. There would be hides to be scraped, made supple and cut and stitched into clothes; meat to be sliced and smoked; nuts to be husked, berries to be dried. Any surplus needed to be carefully stored.

In most years, autumn was ready to oblige. There were plenty of foods to be gathered and it would be possible to preserve some staples, to lay down caches and stores against the cold and hunger of the months to come. Even for communities accustomed to moving around the landscape and with an intimate knowledge of the best locations for specific resources, the careful preservation of a supply of smoked meat, or dried berries and fish would be an important step to guard against starvation. In many ways the quality of life throughout the year to come would depend upon a good autumn. Those who started the season as a time for relaxation with friends and wider family would inevitably end it in smaller groups, working to ensure that clothing was in good order, shelters in good repair against the possible ravages of winter, stores of raw materials laid up, and food supplies well stocked.

Winter storms

With the arrival of winter, the hours of daylight had fallen dramatically. It is quite possible that people produced light from oils and fat in combination with absorbent, slow burning plants, although we have no evidence in Scotland for the sort of small-scale lights that would have suited a Mesolithic home. Fire, of course, is also a source of light, and hearths do exist in most Mesolithic structures suggesting that people chose woods with specific properties in order to help to cheer the worst of the winter darkness.

As temperatures dropped, winter frosts became more common. Well-made fur clothing, a sturdy hut, and plenty of fuel became the prerequisites of life, together with suitable food. On good days hunting parties might set out and individuals could seek smaller game or winter birds.

Those with access to the shore could be reasonably sure of a supply of shellfish and seaweed, although as these are not highly calorific it was important to weigh up the energy expended in gathering them. Fish and crustacea provided better returns.

Winter came first to the uplands. While falls of snow began to cover the hills and the game became scarce, the warm Gulf Stream current that flows around Scotland kept the coast and islands more temperate for the start of the season. The woodlands here might preserve some of their autumnal abundance for just a little while longer. But with time, the birds and animals that had been neighbours to the human communities throughout the summer, would disappear. The sound of bird song dropped, the autumnal roar of rutting stags was no longer to be heard, and, with the coming of snow, a winter silence settled across the land. In a particularly cold year even the running of smaller streams and waterfalls would be hushed as water froze.

Families retreated into sheltered spots where they could conserve warmth and hope to ride out the worst of the storms. Darker, colder days meant that the community lived in close proximity to one another. There was warmth to be gained from human contact. This was a time for the telling of stories, for passing on old wisdom and histories, and even for songs. It was also a time for sleep, a time to catch up on the energies expended over the summer.

Food was undoubtedly scarcer in the winter, just at the time when the community needed it most. While there was nearly always something to be found, poor weather might demand a supply of preserved and stored foodstuffs. Smoking and drying work well for most foodstuffs, but you have to store them in such a way that they will remain dry and that animals cannot get at them while you can easily find them again. For those with a mobile lifestyle this demands special attention. We have no archaeological evidence in Scotland for permanent storage from this period.

Questions for learners

- How does the Mesolithic Year compare to ours?
- What is your modern year like?
- What seasonal changes affect us? Are they the same?
- What can we learn from Mesolithic lives?
- Why is this relevant to us today?
- Could we live on the land in the same way today?
- Are there any natural resources that you ar your family use?

Glenmore treeline. © Jim Higgins ►

A Mesolithic Toolkit

ARCHAEOLOGIST AND REENACTOR JAMES DILLEY DESCRIBES HIS OWN MESOLITHIC TOOLKIT, CREATED USING FLINT KNAPPING TECHNIQUES HE HAS PRACTISED OVER MANY YEARS

"My toolkit is a little like a Scout's adventure kit of pocket knife, matchbox and spork – all the essentials for survival! It's all based on archaeological evidence from around where I live in the south of England, but similar tools were used in Scotland. The cone of flint is known as a *blade core* (top left), sat with a selection of sharp flints that have been struck from the core. These *blades* are some of the most common finds from Mesolithic sites. It is not uncommon for hundreds of complete and broken blades and cores to be found.

Below the blade core are some more flint tools with shaped tips and edges (centre left). These are blades that have 'retouched' into different tool types – the original sharp edge of the blade is modified and shaped by further striking. There are *piercers* for making holes in bone, leather, wood and antler; a *saw* for cutting through hard materials; a *notch* for scraping things like arrowshafts or harpoons; a *burin* for carving bone and antler; and a *scraper* for working animal hides. Below the blade tools is a group of very small triangular pieces of flint known as *microliths*. They are made from small, thin blades and gently worked into a variety of shapes. They are then fixed onto an arrow, spear or harpoon shaft using strong pine resin glue.

The long flint (top right) is known as a *tranchet adze*. An adze is similar to an axe, but the cutting edge is set perpendicular to the handle rather than parallel to it. They were used for carpentry and woodwork. My knife is a simple flint blade that has been glued into a wooden handle. Having a solid, comfortable handle makes some blades easier and safer to use, just like a modern pocket knife.

My fishing line is made of lime bast fibre (centre). Lime trees have long layers of fibres just underneath their outer bark. These fibres can be peeled from the tree, separated through soaking and finally twisted to make a very strong string. The white toggle on the end is a carved piece of bone with two points. With bait on the end, this bone would get stuck in the mouth of a fish like a hook.

But my most important piece of kit is my iron pyrite (bottom right). This brown stone is known today as fool's gold. When struck with a flint *blade* in just the right way a spark is produced and I can make fire. Below my fire lighting set is a bone needle and thread made of flax, a plant fibre – essential for making and mending my clothes. The bone needle is just one example of all of the many other tools I can make out of wood, bone and antler using my *blades*."

James at Malham Cove.

Very Human Habitats

"Although our daily lives may be quite different from those of Mesolithic people, our bodies and brains are not."

Steven Mithen, *The Mesolithic Experience*, 2004, p. 245

Mesolithic people lived mobile lives, moving to different parts of their landscape at different times of year, responding to the seasonal availability of natural resources. They regularly moved camps and lived off both the land and sea as hunter-gatherer-fishers, skilfully exploiting the rich natural resources available to them. To help understand and imagine the Mesolithic experience in today's outdoors, we have created five Mesolithic groups, or clans. Unlike Wolf Brother, where the clans are named after animals, our clans are named after woodland or habitat types and illustrate the five key habitats used in the **Mapping the Mesolithic** activity: Atlantic rainforest, Highland pinewoods, lowland broadleaf woodlands, coastal estuaries and coastal birchwoods. However, remember that our five key habitats are just examples – five pieces of a landscape jigsaw that can be added to with different habitats closer to home. Mesolithic people are likely to have exploited a wide variety of habitats within their landscape.

Following various palaeogenetic studies, our Mesolithic characters are depicted as dark skinned and dark haired. It appears to be the Neolithic first farmers (and foresters) who became light-skinned due to evolutionary pressure to absorb vitamin D from sunlight, because of restrictions in the early farmer's diet. A Mesolithic hunter-gatherer-fisher diet was very varied, allowing people to ingest the necessary vitamin D from their food.

Our Mesolithic characters are also very well-dressed. Although evidence of clothing from this period is very rare, there is every reason to believe that our ancestors were able to fashion clothing that was well made, comfortable and fit for purpose, out of a wide range of natural materials. It is also important to remember the very human desire to express both individuality and community membership, and clothes are a great way to do this.

Inspiration for our characters' clothing was drawn from the archaeological evidence, such as twined fabrics from Lithuania and perforated decorated teeth from Sweden. The plants and animals available in each ecological zone also indicate the resources available for clothing, and pieces of clothing from more recent northern hemisphere hunter-gatherer societies were also considered.

Atlantic rainforest

The coastal Atlantic rainforest people are based on cave and rockshelter sites at Oban, where evidence of human occupation was also associated with shell middens. While cooking pits like these have not been found in Scotland, Mesolithic people could have cooked their food in this way, heating stones in a fire and then placing them in a stone trough or clay-lined pit of water. A fire could also have been set at the bottom of the pit with cooking-skins or a bark surface above the embers, or with the food placed directly into the hot ashes.

Kaarup and Plamen are both wearing skins, which would have been widely available and could be used in sophisticated ways for a variety of weather-proof clothing. Hide can be both pliable and warm, and it is easily cut and shaped. Fur can be left on for additional comfort (often facing inside where warmth is needed), or it can be used for decoration. Different hides and skins have different properties and the Mesolithic community knew exactly how to make use of them all. The archaeological evidence indicates that shells were often used for decoration on clothes or as pendants in this area.

	Kaarup	Plamen
What are they doing?	Kaarup is looking for limpets and barnacles to take to Plamen to cook. He's managed to catch his first crab!	Right now Plamen is wrapping some of the shellfish his people have gathered in leaf parcels and cooking them in a trough of heated water. Plamen is in charge of the children as the younger adults roam further afield for food and resources.
What do they think of their home?	He loves how the waves play with the land – sometimes lapping at the rocks gently and sometimes crashing into them and sending spray high into the air.	He knows the land well, although he no longer roams very far from the cave. His mind can wander from the oakwood on the hills, to the cliffs where he can see the many islands scattered in the sea.
How old are they?	He is coming up to his fourth summer. Soon he'll be shown how to make the razor clams pop out of the sand.	He measures his age by how many grandchildren he has. Kaarup is his fifth, the youngest son of his daughter. His oldest grandchild is now an adult.
What do others think of him/her?	Plamen is proud of how Kaarup is starting to bring food for everyone although sometimes he does get easily distracted.	Kaarup laughs at his grandfather who can pull the funniest faces. Everyone else respects Plamen's wisdom. He resolves many problems.

Highland pinewoods

The highland pinewood people are based on evidence of transient occupation around Loch Tay. While trapping and hunting is one explanation of why people were there, it is likely that there were a number of other reasons. There is little evidence for tanning skins, but it is very likely that this did happen. The lithic evidence from this area does show similarities with that of the west coast, so it is likely there was contact between the two areas. Perhaps the group were following an old route through the mountains.

It's autumn and the nights are drawing in. The highland people live among the pinewoods until the winter really sets in, and then they move to the sea and visit the coastal people, bringing pine resin, furs, skins and smoked meat to share and exchange.

	Pihla	Oihana
What are they doing?	Pihla is setting traps for smaller animals whose fur is useful for lining winter clothing, like squirrels and stoats. She checks the traps each day, skins the animals and takes them back to her mother.	Oihana has the job of tanning the skins Pihla brings back each day. First, she collects urine mixed with ashes from the fire in a bag to soak them in and soften the skin and hair. Then she scrapes off all of the fur. Finally she rubs in fat from her stores to preserve them. Her leather is strong and fine, and very valuable to her people.
What do they think of their home?	Pihla watches the animals she traps, to know which part of the forest they move through.	She prefers the dark, comforting pinewoods to the coast where her people head at wintertime.
How old are they?	Pihla is old enough to bear children, but she has not chosen a man yet.	Oihana is Pihla's mother, but she is still strong and fit. She once surprised a boar and was charged, but killed it on her spear. She wears its tusk with pride, and often tells the story.
What do others think of him/her?	Oihana hopes Pihla will choose a man and have a child soon – as long as the man agrees to move to the pinewood.	Pihla loves her mother, even if she does always smell a bit from the tanning.

We gave Oihana simple shoes, each made of one piece of leather turned up and laced together. Although we don't know whether tattooing was done in the Mesolithic, it is an ancient art and she has two tattooed lines on her ankle. ►

Broadleaf woodlands

The lowland broadleaf woodland people are roughly based on the Mesolithic site at Daer Reservoir in South Lanarkshire. As hunters, Nesa and Yasen are dressed in skins. Nesa's tunic is trimmed with wolf fur and she wears wolf teeth and boar tusk pendants (perhaps a sign of her prowess at hunting), while Yasen wears bone pendants. Nesa's bow is based on bows found in waterlogged deposits in Denmark, although hers is made of yew, rather than elm as the Holmegaard bows were. Her arrows are fletched with grouse and hawk feathers.

	Nesa	Yasen
What are they doing?	Nesa has just come back from the hunt with her people. She is a good shot, and can stalk the prey almost silently.	Yasen has also come back from the hunt, and is quickly sorting flint blades and scrapers to skin and butcher the deer.
What do they think of their home?	Nesa feels part of the forest and can sense when animals are near. She always gives thanks to the animals who sacrifice themselves for the people.	Yasen likes to find different stones to shape into new tools. He is always exploring and sometimes takes long journeys to meet other peoples and find new stone resources.
How old are they?	Nesa and Yasen have one child who is too young to hunt. They left her with Nesa's mother, who is now too old to hunt.	As healthy young adults, the success of their people depends on their skills, strength and stamina.
What do others think of him/her?	Yasen loves his mate and is proud of her skill with a bow. She is so light on her feet she can sneak up on him without him knowing and she is teaching their child to do the same!	Nesa and the rest of her people know Yasen makes the best blades and scrapers. Many young ones in their people learn from him, and he loves to teach them his craft.

Yasen has tied-on leg wraps, which are the simplest way to cover legs, and a long skin tunic. We decided to have his hair up in a similar fashion to Nesa. ►

Coastal estuaries

The coastal estuarine people are loosely based on archaeological evidence along the Firth of Forth. Mesolithic fish traps have been found in waterlogged conditions at various places, such as Bergschenhoek in the Netherlands, Victoria Quay in Dublin, and Lille Knabstrup in Denmark. Fish was a very big part of the Mesolithic diet, as evidenced by the shell middens we've seen before, but also by analysis of the stable isotopes of carbon and nitrogen in human bone from the period. Ola's outfit is a bird-skin parka based on an Aleut item from the Smithsonian Museum. It is likely that bird skin was also preserved and worn, as well as mammal and fish skin. Her blunt arrows have been found in waterlogged Mesolithic sites from Denmark, and are thought to have been especially good for killing birds. The blunt wooden tip did not damage the plumage which was then particularly valuable for fletching arrows and for turning into decorations for clothing and other objects.

The estuarine people are busy in the summer, catching fish and eels, and taking down the wading birds. Some of the fish and meat will be eaten fresh, and some dried and smoked to be kept for later in the year. Coastal estuaries were perhaps the best place to live during the Mesolithic, rich in resources and close to the edge of the wildwood.

Ola's tunic is made of sewn together bird skins. It is decorated with lines of red ochre. Her eye make-up matches the plumage of the water birds she stalks. ►

	Ola	Niko
What are they doing?	Ola is learning how to use blunt arrows to shoot the birds that come to the mudflats in the estuary of the great river. The blunt arrows kill the birds without damaging the feathers or skin.	Niko goes out further into the river to check the fish traps that his people set there. Sometimes he finds eels in the traps too.
What do they think of their home?	She is envious of how the wading birds move easily through the mud and tries to copy their movements, lifting her knees high up in the air on each step, although always trying to be quiet.	He loves to watch the dappled light of the water on the bottom of the river, and how the fish move effortlessly in the water. He sometimes feels like he is a fish, with the light of the sun on his back.
How old are they?	Ola is soon to celebrate becoming an adult.	Niko is a few years younger than his cousin.
What do others think of him/her?	Niko thinks his cousin should talk more. She is always so quiet. But he likes keeping her company while she is out hunting, watching and learning.	Ola finds Niko very annoying with his constant chatter. He scares the birds away. He is only quiet when he is fishing!

Coastal birchwoods

The coastal birchwood people are based on Mesolithic sites in the island of Harris, although also inspired by the cliff-climbers of more recent centuries on St Kilda. Eglay is wearing an amazing parka made from fish-skin. Her boots are made of seal skin, and her brother is wearing a waterproof parka made from seal-intestines in case it starts to rain out on the boat. He has a spear, called a leister, made of two curved bones and one point of flint, which would be for spearing fish and eels. It is based on several examples, one of which was found near the island of Lolland in Denmark.

It is early summer and that means the auks that live somewhere out in the ocean for the rest of the year have descended upon the island to lay their eggs. It is a busy time for the cliff-climbers, but also very dangerous.

	Eglay	Derya
What are they doing?	Eglay is very good at climbing. She has gone to the top of the cliff and is going to climb down to gather eggs from the auks for her people.	Derya is down in the bay about to put out nets from his boat to catch some fish. Sometimes he needs his bone and stone spear to bring in the larger catches.
What do they think of their home?	She loves how the land changes from high mountains with birch forests, down to the cliffs where she climbs and the sandy beaches where they play.	Derya has paddled around the whole set of islands and knows all of the sheltered coves and dangerous rocks and currents. He wants to go further, to get to the island far out in the ocean that can only be seen on very clear days.
How old are they?	Eglay is an older child who does not need much looking after any more.	Derya is a grown man but he still keeps an eye out for his younger sister.
What do others think of him/her?	Derya thinks Eglay's climbing skills are very good. He used to climb when he was younger but Eglay is much better at it now than he ever was.	Eglay thinks her older brother is amazing and really wants to learn how to pilot a boat in the bay like him.

Eglay is wearing a tunic made of fish skins sewn together, and seal-skin leggings and boots. Her bag is made using a type of netting. ►

Exploring the Rainforest

ECOLOGIST ADAM HARRISON DESCRIBES THE IMPORTANCE OF PROTECTING AND CONSERVING SCOTLAND'S ATLANTIC RAINFOREST

"I think the closest we can get to the experience of Scotland's first people is by stepping into our very own rainforest. It may seem surprising, but Scotland does have a rainforest – and it is even rarer than the tropical forests of South America, Africa or South-East Asia.

The weather on the west coast is mild and wet, thanks to the influence of the Atlantic Ocean; and the air is clean because it is far from urban pollution. That lucky combination means that the ancient native oak, birch, ash, hazel and Scot's pine woodlands support an incredible variety of mosses, fungi, lichens, liverworts and ferns. Some are startling, like the hazel glove fungus (*Hypocreopsis rhododendri*) that rests on branches like someone's fingers, or the strangely beautiful blackberry and custard lichen (*Pyrenula hibernica*). And one or two are unique and found nowhere else in the world, like the white script lichen (*Graphis alboscripta*), which looks like alien hieroglyphics. I like to think it was this lichen that inspired later generations to leave their own cup and ring marks on the stones they found in the landscape!

But today's rainforest is only a shadow of what would have developed after the ice retreated. It clings on only in patches where the soil was too shallow or rocky or the ground too steep for farming. The Atlantic Woodland Alliance works to protect, conserve and restore our remaining rainforest.

In spring it is dappled with sunlight and, before the canopy closes, the ground is covered in bluebells, primroses and wood sorrel. As summer progresses the midges come out to distract you from listening to the call of birds like the redstart and wood warbler, the flutter of butterflies like the chequered skipper, and the lazy buzz of insects.

A rainforest summer means rain dripping from the canopy and its garland of ferns, mosses, liverworts and lichens onto the carpet of other 'lower plants' that cover every boulder, stump and stem. Under every rock and on every surface there is a miniature world to explore. In autumn the leaves change and the rainforest shows its colours. Fruit and nuts ripen and fall, feeding red squirrels and other foragers; with enough left over to start a new generation of rainforest trees. We might feel cold in winter, but in reality the Atlantic keeps Scotland's rainforest relatively warm, and when spring comes again life restarts quickly.

Some of the ancient hazel woods on the west coast are thought to have been growing on the same spot since the ice age. They have probably been harvested for wood and nuts for the last 8000 years, and in that time they have provided a home for a rich community of wildlife.

But many of the other rainforest woodlands, particularly the oak woods, have been very heavily managed and have changed over the centuries. They have been grazed as wood pasture, cleared for farming, planted up and coppiced on an industrial scale for firewood, timber, tannin and charcoal. More recently they have been neglected as their commercial value has declined. Today there are as few as 30,000 hectares of good rainforest left in Scotland – less than a fifth of what there could and should be.

These remaining woodlands are very small, fragmented and isolated from each other, surrounded by conifer plantations, farmland and the open hill. That makes it difficult for wildlife to migrate from one to the next, meaning each woodland is less rich and diverse than it should be. Many rainforest sites are in poor condition, over grazed by wild deer and farm animals, invaded by non-native rhododendron and threatened by introduced diseases like ash dieback.

Our rainforest is the last refuge for populations of oceanic lichens, mosses and liverworts that are extremely vulnerable to climate change. Unless we protect, restore and expand our rainforest we will lose a unique part of the world's biodiversity."

◄ **Autumn in Glen Nant, an ancient semi-natural temperate rainforest of birches, hazels and oaks.**

Mapping the Mesolithic

"Landscapes were mapped in the mind. Views from high-points revealed shapes in miniature and made it possible to collate places into three-dimensional models; cognitive maps that could be recalled and decoded at will, a neural database of topographic information. The camp, whether it was used for one night or one month, was the hub of a web of satellite features which comprised a known tract of wilderness; a mappable landscape."

Nicholas Crane, *The Making of the British Landscape*, 2016, p. 19

The **Mesolithic Map Makers** activity has been designed to build on the understanding and concepts outlined in **The Mesolithic Year** and **Very Human Habitats** (which should be delivered first). It is a creative classroom activity that can be linked to both outdoor learning (in the native woodlands and habitats of Scotland today) and aspects of **Learning for Sustainability**.

Landscape and movement

Whether they stayed in one place for most of the year or moved around seasonally, travelling would still have been a common activity for Mesolithic communities. They needed to get to the best places for gathering fruit, nuts, leaves and roots; they would go out to hunt; they were constantly exploring for good sources of raw materials like wood and flint; and they would travel on the water for fishing. It is also likely that people travelled to meet up with other groups of people in order to exchange resources such as furs or preserved foodstuffs, knowledge and people (finding someone outside their close relations to start a family with).

But how would people have travelled around? Despite the lack of roads, or signposts with distances, Mesolithic communities made use of well-trodden paths and the rivers of Scotland provided other useful routeways. Nothing representing a map has been found in the archaeological record, but people developed detailed mental maps about their local area, and how it linked to other places.

Those undertaking a journey for the first time would have travelled with someone familiar with the landscape. The trip would be accompanied by a detailed commentary relating to landmarks and local information, by learning the 'story' of a route people would soon recall the route itself. Longer or more complex routes may well have seen way markers used, much as Inuit build stone signs (known as *Inukshuk*) into the landscape. Despite their simple appearance these structures contain a wealth of information about the nearest community or food cache.

Questions for learners

- Imagine your house, with no roads to link it to other places, and trees around you to obscure your views. How would you get to a friend's or a relative's house? Do you know if there are hills between here and there? Which direction to go in? Is there a river in the way? How do you get across if there isn't a bridge? How long would it take you to get there if you had to walk?

While overland journeys no doubt took place, for many trips it was easier to make use of rivers and water courses. Those travelling along a river develop an innate sense of direction as it falls towards the sea. In many parts of Scotland dense woodland made it difficult to maintain a sense of where you are and, although in some environments there would be open spaces where you could see for long distances, travelling along the river helped people to locate themselves along their journey. The use of watercraft is also a more efficient way to transport your worldly goods, not to mention small children and older folk. The Mesolithic communities of Scotland were adept at getting from one place to another.

Although our clan folk are happiest in the environments they regard as home, they would have been well accustomed to journeying into other parts of the land. They understood the way in which they needed to make use of resources from different habitats in order to survive throughout the year. While some goods could be obtained by exchanging precious materials with others at clan gatherings, their territories extended beyond the boundaries of their local habitats. They may have controlled a larger area themselves; they may have operated complex reciprocal arrangements that allowed them to enter other areas at certain times; or there may have been a relaxed system that relied on individual groups not to encroach when others were in residence. Evidence in Europe suggests that some groups travelled long distances of several hundred kilometres throughout the year, although in Scotland, the local geography obviously restricted this.

Questions for learners

- Think about the locations which you visit today in order to provide for the needs of your family throughout the year. How often do you venture outside your home town? How much do you rely on the internet to access goods from further afield? How large is your 'territory'? How would things change if you had to provide all the basic resources yourself?

As geographer Alastair Bonnett writes, "we are a place-making and place-loving species; our most fundamental ideas and attachments don't happen anywhere and nowhere, they are fashioned within and through our relationship to place" (*Off the Map*, 2014, pages 3 and 299). Thinking about how our Mesolithic ancestors understood the complex habitats and ecosystems within which they hunted and gathered – adapting to life within very human habitats – can help us understand our own place within the natural world.

Cognitive maps

"Cognitive maps were a primary tool. The dots on these mental maps were the features that bonded humans to their landscapes. They were the places that mattered; the places invested with meaning. Cognitive maps bound trails and camps, views and waymarks into unitary areas and hafted attachments to homelands."

Nicholas Crane, *The Making of the British Landscape*, 2016, p. 19

Mesolithic people may not have had maps – nothing has been found in the archaeological record – but anthropological evidence may provide clues. In 1826, a British Navy officer encountered a party of Inuit in the Canadian Arctic. Unable to communicate directly, the Inuit nevertheless helped him orientate himself. They created a map on the beach using sticks, stones and pebbles 'in a very ingenious and intelligible manner' to build a scale model of the region.

On February the 8th 1885, in Ammassalik, Eastern Greenland, an Inuit hunter named Kunit gave the Danish explorer Gustav Holm a driftwood carving that he had made. The wooden map was a representation of a chain of islands along the coast, connected by narrow stems. "[Kunit] had carved the chart himself and declared that it was not unusual to make such charts when one wanted to tell others about regions they did not know," Holm wrote.

An Ammassalik carved wooden map of the eastern coast of Greenland

Although these tiny tactile maps would have fitted neatly into a sealskin pocket and would float if dropped from a kayak, they probably functioned more as storytelling devices – and the act of making the map and telling the story was probably more important than the finished map itself.

In the Siberian Arctic, maps have been found painted onto sealskin. One such map details the Chukchi sea and dates from around 1860. It records whale, walrus, bear and seal hunting scenes, deer herds, people, Russians and Europeans, scenes from the daily life of the Chukchi, shamans, villages, dwellings, fighting scenes, whaling schooners and kayaks. The map is understood to depict a whole year in the life of the Siberian Chukchi people – it is both a map and an illustrated history.

Our cognitive maps of the areas around three of our people's camps try to capture how Mesolithic people might have thought of the landscapes around them and how to travel through them. They may have followed deer tracks, streams, looked out for distinctive trees and rocks, which may have been marked somehow. They could move long distances by gauging their direction on a distant peak, or by keeping track of north by marking the shadows of the sun during the day or the north star at night. Cognitive maps are rarely to a set scale – there are no grid references here – and can be presented as a two dimensional plan or as a three dimensional drawing or model (or even a mix of both).

The Chukchi Map © Pitt Rivers Museum ►

Mesolithic map makers

"Hand drawn maps depict features their creators considered important, with the rest left out. A cartographer always makes maps for a reason – and the details we see on maps are the result of this thought process, presented in a perfect combination of information and design."

Helen Carr, *Hand Drawn Maps*, 2017, p. 6

We have created a set of resource cards to help you make Mesolithic cognitive maps of your own. As individuals or as teams, give your class the roles of the various different clans. They should try to imagine life within their landscape, and the wider network of adjoining habitats. Give them each a set of resource cards – overlapping habitats, seasonal resources and community gatherings – and ask them to draw a map of their year. What place or task will their clan need to visit or undertake first?

Each individual set should have the ten common cards, five or six resource cards representing their own habitat and two or three resource cards from different habitats.

The resource cards help to provide an idea of the resources and landscapes that our Mesolithic forebears made use of. What other resources and locations might be found in your area? Ask your learners what natural resources they think can be found in Scotland today but would not have been available in the distant past, such as sweet chestnuts or rabbits (reference books such as *Flora Celtica* will help you here). Use the blank card to create further resource cards unique to your class, either of local habitats, special places or different resources. Encourage creative thinking, and ask your learners to include their own ideas for seasonal resources or special places.

"When drawing an illustrative map you can break lots of the usual 'rules' of drawing, so don't worry too much about perspective, or the relative sizes of different landscape features. Aim to allow the viewer to quickly get a sense of a place and its landscape, and imagine themselves being there."

Emma Metcalfe, illustrator and map-maker

◄ This map shows the largest of all the clan habitats, that of the Highland Pinewood clan. The map covers a large area (think about it taking a week to walk from one side of the map to the other). Compared to clans living in more resource-rich habitats, the Highland Pinewood clan would have to cover a large area to find enough food and resources. It's likely that they travelled to lower ground to spend the winter, perhaps taking furs and pine resin to exchange at the Clan Gathering.

◄ This map shows the habitat of the Atlantic Rainforest clan. The map covers a medium-sized area (think about it taking one or two days to walk from one side of the map to the other). With plenty of food and resources within reach, the Atlantic Rainforest clan likely made more shorter journeys – and had the option of fishing at sea and along the coast. Can you find the Great Mountain and Sacred Waterfall? Landscape features like these would have been important landmarks for Mesolithic people, possibly with spiritual significance.

Key themes

- **Connected landscapes:** of woodlands, mountains, valleys, rivers, estuaries, and islands.
- **Defined microhabitats:** such as the loch shore, woodland glades, the woodland edge, hazel stands and fishing pools.
- **Seasonal resources:** such as the hazelnut harvest, or gathering fungi or cloudberries.
- **Special places:** such as the great mountain, or the sacred waterfall.
- **Movement and travel:** in looping arcs from basecamp, or direct lines from basecamp to hunting camp. Coastal travel by boat was also very important.
- **Different scales:** the estuarine people may not have needed to move much from their basecamp, as their land was so rich in resources (and so their maps may be small scale); while the highland pinewood people would have had to range far and wide (and so their maps would be large scale).
- **The Mesolithic compass:** orientating by sunset, sunrise, the sunlit sky and the sunless sky.

You should start by discussing maps. Research and investigate iconic and unusual maps, such as the map of the London Underground. Think about hand drawn maps, and all the various styles and techniques – you could have a selection of local maps ready to discuss. Discuss different landscapes, significant landmarks and favourite viewpoints. Discuss the cartography itself, such as keys, grids, contours and compasses.

Questions for learners

- Does anyone have a favourite map? Perhaps from a book or film?
- Does anyone have a favourite landscape or viewpoint? Perhaps local to theim or from their holidays?
- What shapes can they see in their landscape?
- What scale is it?
- How diverse is their landscape?

If you are approaching the map-making as a collaborative group task, remember to agree on the key locations shared by each of the groups, such as the Clan Gathering and the Great Mountain. You could create a large scale classroom map, detailing the locations of the main habitats and the key locations in advance.

◄ **This map zooms in on the habitat of the Estuarine clan. The map covers a relatively small area (think about it taking a few hours to walk from one side of the map to the other), made up of lots of microhabitats. Lots of food and resources close together mean lots and lots of short journeys, with food never far away.**

The learners should start their own maps by thinking about their landscape and base camp – why are they camping here? What resources are nearby? They should also remember more general essentials, like a source of water, or store of cut wood being seasoned for the fire. What possible hazards are out there? Would the camp be prone to flooding if it were to rain a lot? Will it be sheltered from the worst of the winter storms?

Talk about their landscapes – if they imagine a river valley, would their clan cross the mountains on either side? They may use higher ground, or estuarine wetlands, but would they do so in winter? Some habitats are huge – pinewoods or broadleaf woodlands for example – and could require a lot of travel to exploit the seasonal resources and prepare for the clan gathering. But some habitats are relatively small and rich in resources – an island or estuarine environment for example – and may not require much movement. Talk about the scale of their maps – are they camping to exploit the resources of an estuary, and moving along trails in the marshlands, or do they need to range much more widely, from hunting grounds in the uplands to fish in the river in the valleys below?

They should carefully annotate their maps, explaining their decisions; and use keys and symbols to show individual elements. Dotted or dashed lines could indicate travel, and camps both big and small could be indicated as groups of tepee-style structures or dome-like tents. Some camps could be semi-permanent, with seasonal camps and temporary camps being visited by smaller sub-groups to undertake specific tasks. Remember to suggest to your learners that travel need not be circular over the course of the year, and that the clan can split into smaller groups, moving radially or in loops from the base camp.

They should think about movement and travel. Groups moving overland would have been walking, perhaps pulling a travois (drag sled). But were they walking above the tree line for visibility, or along a watercourse in woodland? Boat journeys would have involved kayaks and skin boats like coracles along the coast, and perhaps dug out log canoes on rivers.

They could design their own Mesolithic compass. Mesolithic people didn't think in terms of north, south, east and west – but they did know that the sun always rose on one side of the sky and set in the other. They knew that the midday sun marked the sunlit sky (to our south). They followed the seasons and knew that the midsummer sun rose early in the morning, far into the horizon of the sunless sky, and rose high in the sky to set late in the day; and they knew that the midwinter sun rose late in the morning, closer to the horizon of the midday sun, and set soon after, never rising high in the sky. They would have also used the stars when traveling at night, knowing that one star was always pointing to the north; by keeping it to their right as they walked they would be going west, or keeping it to their back they could be walking south.

You could ask your learners to present and explain their habitat maps and their planned year. Do the various maps overlap (using landmarks such as the great mountain, rivers and waterfalls, or coastal features such as bays and promontories) to describe a wider imaginary landscape? Which habitats have the richest year-round resources (such as the Atlantic rainforest and coastal estuaries), or are particularly reliant on the summer and autumn seasons (such as Highland pinewood)?

Story maps

"Story maps represent a place as it is perceived by an individual or by a culture moving through it. They are records of specific journeys, rather than describing a space within which innumerable journeys might take place."

Robert MacFarlane, *Off the Grid*, in *The Writer's Map* edited by Huw Lewis Jones, 2018, p. 98

Story maps focus on the individual journey, rather than the landscape and topography within which it takes place. The parameters are the sight or experience of the traveller, often including notable landmarks, happenings (past, present and future) and anecdotes. Story maps need not even be drawn. As writer Robert MacFarlane notes, "when carried in the head [as narrative of spoken maps], story maps are infinitely flexible, always available and invulnerable to the tattering powers of wind and rain. They are deep maps too, which register the past and acknowledge the way memory and landscape layer and interleave" (*Off the Grid*, p. 101).

"We left Gathering Camp at the beginning of Yellow Leaf Moon. The Sun was getting old, but he wasn't tired yet. It was mild when we arrived at River Mouth Camp. A circle of hills shelters it from all the winds. For those of you who've not seen it, our River flows down through many little gorges into a wide valley where it winds among the marshes, always heading for the Sunless Sky, until it reaches the salt flats and open water. River Mouth Camp lies on dry ground at the foot of a craggy hillock. Every year we clear the saplings from the top of Lookout Hill so we can see out over the marshes, through the narrows to the Open Sea, and the islets off Sand Island. There were

still plenty of berries, hazelnuts and crab-apples when we arrived. There'd been a lot of rain, and on our first day our baskets were overflowing with every kind of mushroom. It looked as if we were going to live well…"

Margaret Elphinstone, *The Gathering Night*, 2009, p. 7

As individuals or as teams, give your class the roles of the various different clans. Give them the verbal instructions below – you could let them take notes or to try to remember – and ask them to draw a map of their route to their destination. Ask them to add their own details – perhaps good places to rest, or to camp, or to hunt, and special places like way markers or mountains. These story maps should not be annotated – your learners should also be able to present their story map verbally. Do the various maps overlap (using landmarks such as the great mountain, or the coast) to describe a wider imaginary landscape? They could then write descriptions and stories, focusing on the resources they may need, or the reasons for their travel.

"Pihla, find Plamen's people on the edge of the land towards the setting sun and tell them to be ready for our coming. Take these gifts of fine pelts to line their winter clothes. Remember to stop at the ringing stone and to give thanks to your ancestors. Turn your back to the great mountain, go down to the loch and follow the river where the sun leads you. When the river opens out into the last loch, turn towards where the sun dies at the end of the year but follow the coast on your left hand to find Plamen's camp facing the endless ocean."

"Niko, lets go and tickle some trout – I'll show you my favourite pool and we'll see if you can keep quiet for long enough to fish. We must walk up the river away from the dawn, and then turn up the second stream that joins the great river, towards the sunless sky. My pool is under the willow trees in the bend in the stream just below the waterfall. We can look out for some shy birds too, so I may have some new feathers for my hair."

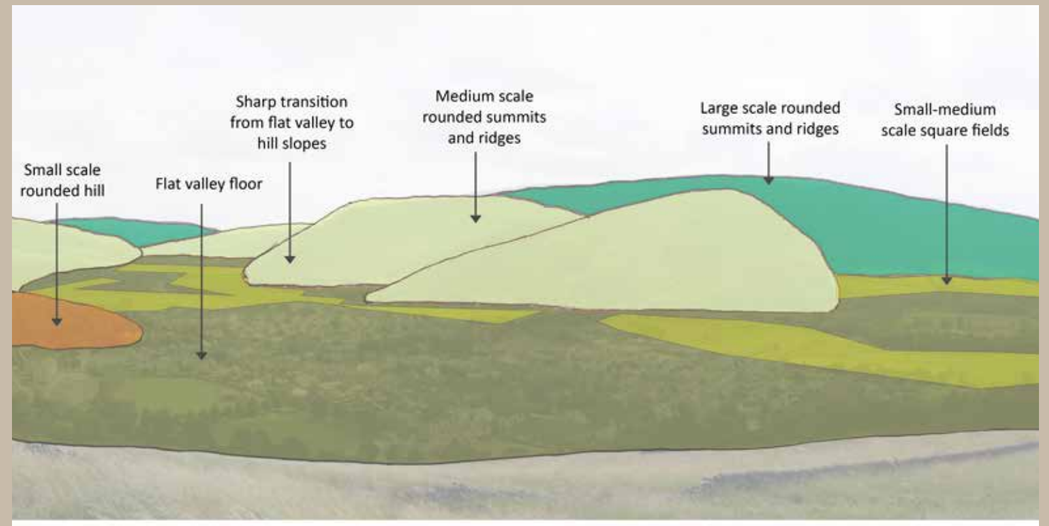
◄ **Drumbeg Birchwoods.** © John MacPherson

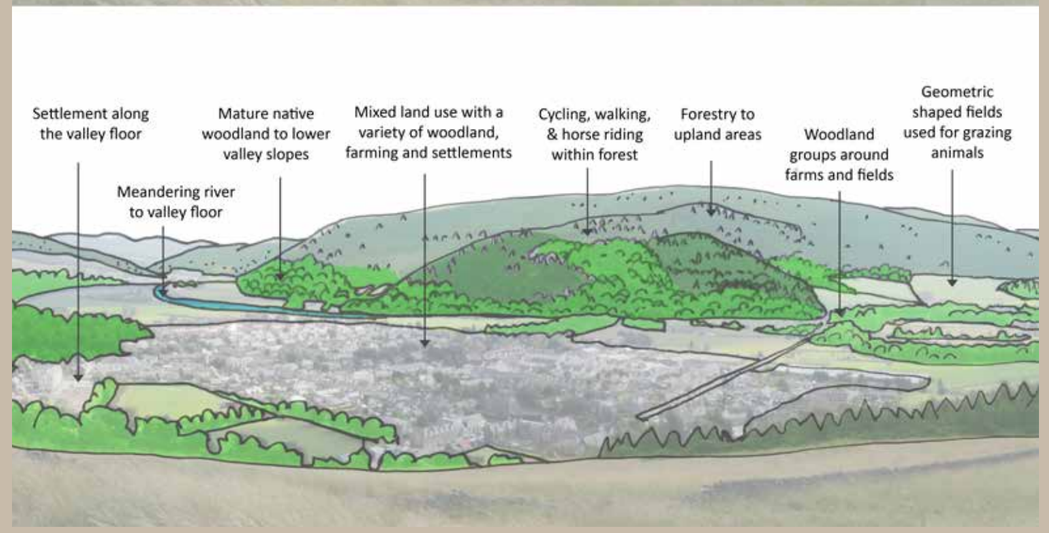
"Nesa, we will walk upstream to where the river forks into two, where I saw the heard of deer drinking last night at the edge of the forest. If I had my bow, and your soft tread and true aim, I would have brought back a fine buck!" "We shall bring one back together, Yasen. We will need to leave when it is still dark. The moon will be almost full. Let's hope the sky is clear so it will light our way. We must be sure to stay downwind of the deer, so we will need to leave the bank of the river and turn towards the dawn for a short way, but without losing sight of the river. Then we can turn back on ourselves and watch the deer come down to drink."

"Kaarup! Why are you going that way? The sea is the other way! Go to the end of the beach and look in the rock pools for the little shells and for any nice red crabs that are hiding under rocks. You know how to pick them up, don't you? Reach for the back, that's right. Take your bag, young 'un! And as soon as the water starts to lap on the green slimy rocks, you come straight back here. It's too late to get any spoots today, we'll go down to the far beach when the sea is at low tide in the morning and coax them out of the sand."

"Derya, I could see for miles up there! I think I could see that island you have told me about. It was a dark green line on the horizon towards the setting sun. There was a line of white cloud above it. But the sea looked very dark in between, and there was a grey line running up the middle of the straight between us and that island. Is that one of those currents you've told me about? By the way, I saw you pull in that net, and you nearly bashed your boat against the rocks! I was going to call out to you, but I knew the birds would be scared away if I did."

This 'story map' aims to convey the idea of the seasons and a year in the life of a clan. It probably doesn't look like what children would expect a map to look like! It's inspired by Lone Dog's Winter Count (a Native American artefact from the Nakota people which records the tribe's history using pictures; the beginning is in the centre, as this is what Lone Dog did). The Nakota's year ran from the first snowfall of the year to the first snowfall of the following year. We have started our year with the falling of autumn leaves. Could something like this have been drawn using minerals such as red ochre on Oihana's boar skin? ►





Designing the Landscape

LANDSCAPE ARCHITECT ALISON CHISHOLM DESCRIBES HER WORK PLANNING SCOTLAND'S NATIONAL FORESTS AND LAND

"Landscape Architects help plan and design places and spaces, from streets and housing developments to parks and forests. We work at lots of different scales, from large landscape-scale planning, such as the design of towns, cities and regions, to small-scale planning, such as play parks, land art, trails and community spaces. Forestry and Land Scotland's Landscape Architects work on the spatial design of many different projects within our forests, from forest design and land management, through car parks and visitor facilities, to new footpaths and viewpoints. Landscape Architects help design the forest so that it fits within the landscape, taking into account factors such as resilience to the climate emergency, growing conditions, land management objectives, natural assets, and public access and recreation.

When starting a project I'll gather and review all the information available, such as maps, aerial photographs, topography and landform, soil types, existing woodland cover, existing natural assets and ecosystem services, habitat networks, archaeological sites, recreational use and path networks. It's important to be familiar with the area, and a site visit really helps me understand the context. On a site visit, I'll record what I see by drawing sketches, annotating maps, taking photographs and roughing out ideas. I'll record options in plans or diagrams and use these to present to and discuss with colleagues and the local community. It is always important to involve others in any landscape design, as they may have unique perspectives and knowledge that should be taken into account.

During my analysis I'll think about landscape character – what makes that landscape recognisable or special. I'll review the existing woodland and forests within the area and try to describe the patterns and features I see. I'll look at the shape of the land, vegetation patterns and settlement zones in order to describ the shape, scale and visual diversity. These important factors all influence the design of new woodland and forests.

In this example, some of the shapes I can see are: rectangular fields, round summits, linear roads, flat valley, linear tree belts, smooth slopes and a meandering river. The scale of landscape is medium scale to the river valley, with enclosing medium scale hills and large scale hills behind. Some landscapes are very simple with only a few features, while others are very diverse. This landscape shows more complexity to the valley floor with a pattern of streets, houses and roads in the settlements, and square fields and woodland belts outside. This pattern simplifies on the hill slopes with a texture of native woodland and mature mixed conifers on the lower slopes, giving way to a simple pattern of conifer forestry into the upland areas. There will also be a variation in colours – the broadleaf and Larch trees will change colour throughout the seasons. I'll use my analysis of the landscape to design a forest that replicates natural forms and textures and captures the spirit of place. The forest design should visually contribute to the landscape while still meeting our objectives for sustainable land management."

The Ecosystem Approach

The ecosystem approach helps us to think constructively about our natural world and about complex issues such as the climate emergency, habitat resilience, land use integration and flood risk management. The natural assets of our environment are the foundation of all that we do, just as they were for Mesolithic people. At a simple level they can include forests and woodlands, valued places and landscapes, priority habitats such as Atlantic rainforest and key species such as the red squirrel. At a more complex level they can include ecosystem integrity and interaction, concepts of biodiversity and resilience, and the wide range of social, economic and environment benefits that can result from *sustainable land management*.

Natural capital describes the stock of natural assets in any given area. The stock of natural assets can be broken down into a description of *quantity* and *quality*. Natural capital is a useful term because it helps to set this kind of capital alongside other forms of capital (such as buildings, bridges and roads). From these stocks of natural capital come *flows* (or outputs) of goods and services, termed ecosystem services. Put very simply, our ecosystem services comprise the *benefits* resulting from our natural assets. These might be goods such as timber, venison or hydropower, or services such as flood mitigation or carbon sequestration, or even less tangible cultural benefits such as those resulting from inspirational places and landscapes. All of these *flow* from the natural capital. If we are able to sustain these flows over the long term, we can say that our management is *sustainable* – but if we're depleting the natural capital from which they flow, then our management will become *unsustainable*.

Taken together, the concepts of natural capital and ecosystem services help describe the range of natural assets in any given area. Identifying significant natural assets is an important element of Forestry and Land Scotland's land management planning process, helping us to improve place-based management at a range of scales and ensuring the protection and conservation of biodiversity and habitat networks.

Today, our Planning Foresters consider where our significant natural assets are, and try to understand the various ecosystems within any given area, thinking about their integrity and function. They look at the pressures and risks facing our natural assets, particularly in light of the climate emergency. They think about the resilience of any given natural asset, and how they can recover from threats and continue to develop and thrive. They identify key spatial patterns across habitats to understand where connectivity and scale can enhance the functioning of our natural assets. These include the way that soils, climate and habitats change across the landscape and the ways that different species utilise landscapes.

And in particular they consider timescales, because ecological change occurs in both the short term and the very long term. They evaluate how our most significant natural assets are changing and set out how they intend to influence that change (if at all).

Our Mesolithic ancestors had a similar relationship within the complex ecosystems found across Scotland's changing landscapes. In the Mesolithic, life in any single ecological habitat would have been precarious. The range of available food sources was restricted, and failure in any one could mean disaster. So our Mesolithic ancestors would have sought to occupy a landscape rich in as many ecological zones as possible – where a group or community could harvest resources all year round, from forest to shore and beyond.

Mesolithic people may not have had maps in the traditional sense, but they did think spatially and temporally, planning their movement through their natural world to gather and exploit seasonal resources. They also sought to influence their environment, and there is archaeological evidence of fire setting to clear trees, and of woodland management to encourage the growth of hazel. Throughout the year, animals would be hunted and food could be gathered and eaten by groups moving around their landscape. All of the local resources would be known and the knowledge of how to exploit them passed from generation to generation. Stores would be built up for the winter months, with food such as roots, nuts, meat and fish prepared for storage and kept safe and dry.

Thinking about how our Mesolithic ancestors understood the complex habitats and ecosystems within which they hunted and gathered – adapting and sustaining life within very human habitats – can help us understand our own place within the natural world.

Restoring the Pinewood

FORESTER GILES BROCKMAN DESCRIBES THE LONG-TERM WORK TO RESTORE THE CALEDONIAN PINEWOODS

"The ancient Caledonian pinewood is thought to have once covered 1.5 million hectares, or almost 20% of Scotland. By the middle of the 20th century – after thousands of years of logging and clearing the land for agriculture – the pinewoods were small and dispersed. By 1959, all of the surviving fragments were judged to be in a poor condition and under threat. In some areas, foresters had planted non-native conifers that threatened to push the native woodland out, while other areas continued to be grazed by sheep and deer and were unable to regenerate themselves with new trees. There had been a similar impact on many other native woodland types as well. Conservation projects were started to secure this surviving ancient woodland – and today the conservation and restoration of native woodlands is accepted as being important work.

A healthy wildwood is a complex relationship between the soils, fungi, plants, trees and wildlife that has developed over thousands of years. Even in a very damaged wildwood some of these relationships can still be found, and they become critical building blocks from which the work of restoration can start.

The work of restoring native woodland begins with an ecological survey – this information enables a forester to plan the various phases of restoration. The process of creating a forest plan identifies the different threats and opportunities and helps the foresters to develop solutions to deal with the different situations.

In Glen Affric, two of the most important factors were that the surviving trees appeared to be very old and that very few new seedlings were being produced – and those seedlings that could be found were being browsed by deer which prevented them from growing up. So the first forest plan included the building of a fence to keep the deer out, and regular culling to manage the deer numbers within the woodland. This was followed by planting the glen with young trees that had been grown in a forest nursery using seed collected from the pinewood. Within the first ten years of the project, foresters noticed that by reducing the deer browsing, new seedlings had started to appear by natural regeneration. This proved that the old trees were still able to produce good seed and that the woodland had simply been prevented from establishing by the high browsing pressure.

It is important to monitor how a restoration project responds to management interventions – this enables us to determine whether our actions are having a good effect. In Glen Affric, the knowledge that the old pinewood could produce new seedlings meant that the foresters could now make better decisions about what species were still missing – and where it was most useful to plant them. Foresters were able to turn their attention to a new phase in the project and begin to remove the non-native conifer plantations and make the restoration project area larger. Restoring a wild wood takes a long time – the Glen Affric project has been running for sixty years. Over this time, the forest plan has allowed the vision for pinewood to be passed on to each new forester, who in turn has been able to take it on another step along its journey to a better future."

◄ **Glen Affric Pinewood.** © Colin Leslie

Common to all

Base Camp

The main base camp for your group. This could be central to their area, or placed close to the busy **spring** and **summer** resources.

Where will you camp?

Common to all

Hunting Camp

A small, short term camp site used by a group of hunters and set close to a good hunting ground or fishing place.

Common to all

The Clan Gathering

All of the people of the land meet here in **late autumn**, to share resources, work together on large tasks, and to meet others and exchange news.

Common to all

Hazelnut Harvest

This is an important event, where your people gather and process a huge store of hazelnuts when they are ripe in the **autumn**. They will see you through the coming winter. Where are the best hazel trees?

Common to all

The Great Mountain

A sacred place of spirits, it guides you through the land as it can be seen from miles away.

Common to all

The Sacred Waterfall

At the head of the river, the sacred waterfall is an important landmark and of great ceremonial significance. Your people travel here at special times of the year. What time of year will you visit?

Common to all

Salmon Run

All of the people of the land would have made use of this annual bounty, when the salmon travelled up the rivers from the sea to spawn. The salmon run throughout the **summer**.

Salmon are very good eating, because they are very oily. The skin can also be cured and made into bags and even clothes. Where is your river?

Common to all

Deer

The deer was an important animal, providing meat for eating, skins for clothing, bones and antler for making needles and hunting tools, and sinew for making strong string. It was hunted throughout the year. The deer was a sacred animal for some groups who used bone and antler headdresses for special ceremonies.

Where will you hunt for deer?

Common to all

Birds

All of the people of the land would have collected birds eggs in the **summer** and hunted birds – such as wood pigeon – thoughout the year.

What birds can be found in your habitat and where would you find them?

Common to all

Honey

All of the people of the land would have collected and stored honey, seeking bees nests throughout the **summer** and **autumn**.

Where will you look for honey?

Atlantic Rainforest

Nettles

Only growing at the edge of the wood or in clearings, nettles can be eaten (the leaves are very nutritious) and dried and stripped and made into string and baskets for making traps and containers. Nettles for eating are best gathered in the **spring** when the leaves are pale green and tender, and in **late summer** if you want to make string from the long stems.

Atlantic Rainforest

Carragheen seaweed

This red seaweed grows on the rocks that appear out of the sea at low tide and is rich in health-giving minerals. There are other edible seaweeds that may well have been made use of by the Mesolithic community. Seaweed for eating is best harvested in **early summer**.

Atlantic Rainforest

Whelks

Gathered from rock pools, whelks can be eaten all year round, although you have to use a sharp stick to get the sea snails out of their shells once they are cooked. Then the shells can make beads to sew on clothing.

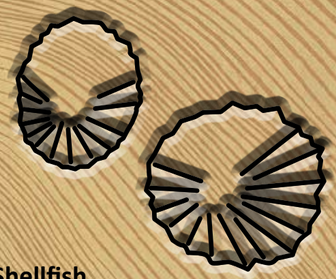
Atlantic Rainforest

Crabs

Crabs make good eating. You drop them in boiling water to cook them, and then crack open the claws and body to get at the white and brown meat, but don't eat the green meat!

You can find big brown crabs at low tide in **spring**, **summer** and **autumn**.

Atlantic Rainforest



Shellfish

Limpets, oysters and mussels are a staple foodstuff. The shells also make good tools. Limpet shells protect the hand while steadying a drill, oyster shells are good for scraping and as scoops. What else could you use shell for? You find them clinging to rocks by the shore at lowtide **all year round**.

Atlantic Rainforest

Loch shore

The loch shore is a good place to hunt deer when they come out of the forest to drink. You should also look out for bears, wild boars and beavers!

Highland Pinewood

Pine resin

The bark of a pine tree can be baked in ash piles under fires to extract the resin, which then can be mixed with fat or beeswax and crushed charcoal to make glue to fix microliths. Pine pollen can also be collected as the pine cones dry and cooked to provide a nutritious foodstuff – and you can make pine tea from boiling pine needles!

Highland Pinewood

Small mammals

Small mammals such as squirrels, martens and weasels were hunted and trapped for their fur. The pelts are thin but the fur is attractive and warm, and is a good liner for winter clothes.

Autumn is a good time to hunt them as the leaves are falling from the trees.

Highland Pinewood

Wild Boar

As well as the meat, wild boar have very thick skins that make good beds to protect from the cold of the ground. The males have big tusks that can be used as decoration and as hide scrapers while the bone is also a useful resource. They are best hunted in the **summer**.

Highland Pinewood

Blaeberries

Blaeberries are good to settle a bad stomach, and are nice to eat anyway. Lots of other animals like to eat them so you can also watch a blaeberry patch to wait for animals to hunt. Other highland berries may also have been favourites, like raspberries and crowberries.

Berries are gathered in **late summer**.

Highland Pinewood

Cloudberries

Bright orange cloudberries are relatively rare today, but would have been a staple food in the Mesolithic, gathered in huge quantities in **summer** from bushes in the high moorland above the forest and stored for the winter.

Highland Pinewood

Woodland edge

The montane woodland edge is a good place to hunt deer when they graze in the open, above the treeline in the **spring**, **summer** and **autumn**. Hunting camps look down onto the woodland edge from places with good views all around.

Broadleaf Woodland

Hazel stands

Well-managed hazel stands can give good straight but bendy branches for making shelters, coracles and baskets. Hazel is also good for arrow shafts. The **winter** is a good time to cut them, when they are free of leaves and before the tree starts to grow again in the spring.

Broadleaf Woodland

Woodland glade

A woodland glade is a good place to hunt aurochs and deer all year round when they graze in the open, and the long grass can be harvested in **autumn** for making coiled baskets or for lining shoes and beds. Smaller tree species bearing berries or nuts often grow at the woodland edge. Knowing where your woodland glades were would be really important!

Broadleaf Woodland

Crab apples

Crab apples can be cooked and eaten immediately or dried and stored for later. They are gathered in the **autumn** and were an important foodstuff.

Broadleaf Woodland

Brambles

In the **spring** the leaves can be eaten, whetting your appetite for the fruit that grows later. Early in the **summer** the growing bramble tendrils can be carefully cut, stripped of thorns with a cleft stick and twisted into rope to repair houses. Later in the **autumn** the blackberries provide a sweet treat.

Broadleaf Woodland

Fungi

A variety of mushrooms such as chanterelles and puffballs make delicious food and many have useful healing properties. Cramp balls and birch polybores also make good tinder to start a fire with. Mushrooms are collected in **late summer** and **autumn**.

Warning: some mushrooms are very poisonous, so you had to know good from bad!

Broadleaf Woodland

Pignuts

Each pignut plant produces a delicious nutty tuber that can be eaten raw or roasted. Their delicate white flowers can be found in **spring**, decorating the woodland glades where the auroch graze. Pignut tubers take a few years to grow, so you can't harvest a glade every year!

Coastal Estuary

Willow

Willow only grows along fresh water rivers flowing to the estuary. Its branches are very flexible and are good for making baskets, fish and eel traps. The branches are gathered in **late spring**. The bark can be chewed as a painkiller.

Coastal Estuary

Eels

Special eel traps are made like fish traps but with spiky bits of willow pointing backwards into the trap from the mouth. The eels can swim in but not out. They are hunted in the **summer** and can be eaten or dried for storage.

Coastal Estuary

Wildfowl

Geese, ducks and swans made good eating – both the bird and its eggs. Goose feathers are also good for fletching arrows and bird skins can be used to make light clothes. Migratory birds such as geese **overwinter** here and spend the summer further north.

Coastal Estuary

Fish

Fish make good eating! They can be caught using spears and harpoons, nets and traps – and even tickled out by hand if you know how! Tidal fishtraps and fish pools in the river would have been visited in **spring**, **summer** and **autumn**.

Coastal Estuary

Club-rushes

Club-rushes have highly nutritious seeds, stems and tubers. They are also used for weaving into baskets and sleeping mats. It grows in clumps in marshes and next to slow-moving parts of the rivers flowing into the estuary and is gathered in the **summer**.

Coastal Estuary

Eelgrass

Both the leaves and the roots of this underwater plant can be eaten. They are also very good dried into little cakes for the winter. Some communities made use of eelgrass to thatch their huts. Eelgrass is gathered in the **autumn**.

Coastal Birchwood

Birch tree

The papery bark makes good tinder for the fire, while the thicker bark is very pliable and can be rolled to make longer lasting firelighters or, as it is waterproof, sewn into containers. The very thin twigs are good kindling. Damp birch is good for smoking and drying meat. Some groups made birch tar which was used as glue and mastic.

The various products from birch trees were processed in the **spring**.

Coastal Birchwood

Cliffs

Seabirds like Great Auks nest on the side of the cliffs to keep themselves safe from predators, but if you can climb well you can climb down to take a few eggs in the **spring** and **early summer**.

Coastal Birchwood

Seals

Sealskin makes very good waterproof and warm boots and coats, the blubber can be used to seal coracles and in lamps, and even the seal's intestines can be sewn together to make a raincoat. Seals are particularly hunted during their breeding season in **late autumn** and **early winter**.

Coastal Birchwood

Beached whale

A stranded whale provides a bounty of meat, blubber, bone and skin for further use. Although you can't plan for a beached whale, it's always good to keep watch for one **all year round**.

Coastal Birchwood

Wild carrots

Wild carrots are smaller and tougher than today's cultivated carrots, but are still very tasty. Wild carrots are picked in the **autumn**.

Coastal Birchwood

Inter-tidal zone

The sand, rocks and pools that are left behind at low tide are great places to find seashells, crabs and seaweed **all year round**.

Further Reading

The State of Scotland's Rainforest (Atlantic Woodland Alliance, 2019)

Off the Map (Alastair Bonnett, 2014)

Hand Drawn Maps (Helen Carr, 2017)

The Making of the British Landscape (Nicholas Crane, 2016)

Europe Between the Oceans (Barry Cunliffe, 2008)

The Gathering Night (Margaret Elphinstone, 2009)

Wild Harvesters (Bill Finlayson, 1998)

The First Foresters (Forestry and Land Scotland, 2019)

Outdoor Archaeological Learning (Forestry Commission Scotland, 2017)

Mezolith (Ben Haggarty and Adam Brockbank, 2010)

The Writer's Map: an atlas of imaginary lands
(edited by Huw Lewis Jones, 2018)

Wild Food (Ray Mears, 2007)

Flora Celtica: plants and people in Scotland
(Wiliam Milliken and Sam Bridgewater, 2004)

A History of Ancient Britain (Neil Oliver, 2011)

Wolf Brother (Michelle Paver, 2004)

Mesolithic Scotland and its Neighbours (edited by Alan Saville, 2004)

People and Woods in Scotland (TC Smout, 2003)

Mesolithic Lives in Scotland (Graeme Warren, 2005)

About the authors

Kim Biddulph

Kim is a freelance archaeological educator. Her mission is to promote an understanding of how archaeological knowledge is created. She runs Schools Prehistory and 500BC, as well as leading and enabling workshops for children in archaeological investigation and hands-on experiential and experimental activities.

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Matt is Forestry and Land Scotland's archaeologist. He helps ensure the protection, conservation and presentation of the historic environment in Scotland's national forests and land. He aims to promote and develop the methodology of creative archaeological visualisation, and to highlight the potential for archaeology within schools and outdoor learning.

Caroline Wickham-Jones

Caroline is an expert in the archaeology of Mesolithic Scotland. She has directed excavations at several major sites, and undertaken research across the country. She is particularly interested in the Mesolithic lifestyle and the relationship between the early communities and the world in which they lived.

Imagine the world of the wild harvesters, living within the wildwoods of Scotland over six thousand years ago.

Using an inspirational blend of archaeological discussion and creative activities, the authors draw on the work of leading archaeologists to describe an ancient past that is still accessible today – rooted in an ecological understanding of place and time, and in our human response to both.

A companion to *The First Foresters*, where we met the Neolithic pioneers, living and working within the wildwood, *Into the Wildwoods* uses archaeological evidence to discover the Mesolithic hunter-gatherers who came before. Our key objective is to explore the interconnected ideas of habitats, natural resources and seasonal change, developing the Mesolithic as a classroom topic in line with *Learning for Sustainability*.

This resource will be of interest to teachers, archaeological educators and youth group leaders – and to anyone with an interest in the presentation and interpretation of our ancient past.

Praise for *The First Foresters*:

"Created by a remarkable array of informed talent"
BRITISH ARCHAEOLOGY

"A richly illustrated and engaging learning resource"
CURRENT ARCHAEOLOGY

Forestry and Land Scotland | Coilltearachd agus Fearann Alba

Outdoor & Woodland Learning SCOTLAND