



Pathways to Ancient Britain Project

## Happisburgh Site 3

Information to support teaching for KS2 Prehistory



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## Introduction

At approximately 900,000 years old, Happisburgh Site 3 is the oldest archaeological site in northern Europe. It is notable for its excellent organic preservation of beetle, plant and mammal remains. In 2013 the earliest known human footprints in Europe were discovered just to the south of the site.

Site 3 consists of a complex series of channels cut by a slow-flowing river that was close to its estuary. The river was bordered by grassland and surrounded by conifer-dominated forest. Human presence at the site is indicated by worked flint flakes and footprints. Winter temperatures may have been at least three degrees Celsius colder than today, but the presence of footprints from what may be family groups and children suggests that the humans at Happisburgh were year-round occupants and able to cope with the long, cold winters.

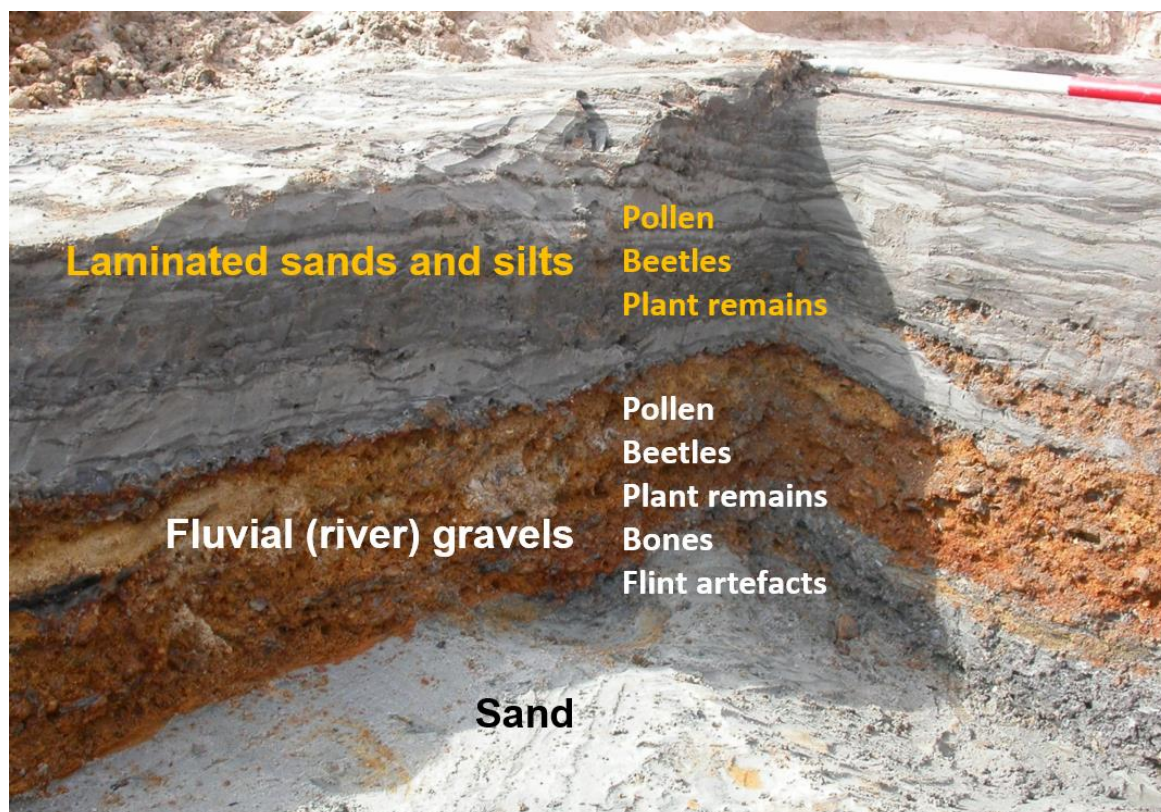
Since 2013 there have been few opportunities for excavation due to high beach sand. Most of the work therefore has involved regular monitoring for new exposures with the help of local volunteers, whose finds are now being systematically recorded.





## How can we reconstruct past environments?

Our understanding of archaeological sites is based on a range of evidence including the sediments we excavate and the biological remains that are preserved within them. The sediments themselves help us to understand the position of the site in the landscape. The biological evidence allows us to build up a detailed picture of the plants and animals that would have been present at the site. These in turn can help us build up a picture of what the environment at the site was like as different species need different conditions to survive. The more lines of evidence that we have the better as we can use the different types of evidence to support each other.



Not all sites preserve biological remains because their organic nature means that they often decompose. Certain conditions such as deep burial and waterlogging (anaerobic) can help preservation but what is good for one type of evidence is not always good for another. The organic evidence that helps us to reconstruct past environments includes plant remains (e.g. pollen, spores, seeds and wood), insects and bone. However, whilst acidic sediments are good for pollen preservation bone preserves better when the sediments are alkaline.

## Where does Happisburgh Site 3 fit into the timeline of human evolution?

At approximately 900,000 years old, Happisburgh Site 3 is the oldest archaeological site in northern Europe. As shown in the table below, people first reached Britain during the geological period called the Pleistocene. The archaeological name for the period, the Lower Palaeolithic, comes from the stone tools made by these early humans.

### Who made the stone tools and left the footprints?

So far, no human fossils from this period of time have been discovered at Happisburgh or anywhere else in Britain but we can look further afield to get an idea of who these early humans may have been. At a site called Gran Dolina in northern Spain, human fossils have been found that date to around 850,000 years ago. These have been assigned to a human species called *Homo antecessor*.

In many ways they were quite similar to our own species, including being of a similar stature and physique. They were also different to us in some important ways, including having smaller brains. Estimates of body size from the footprints at Happisburgh fit within the range of *Homo antecessor* and it is possible that it was this species of human that lived in Britain almost one million years ago.

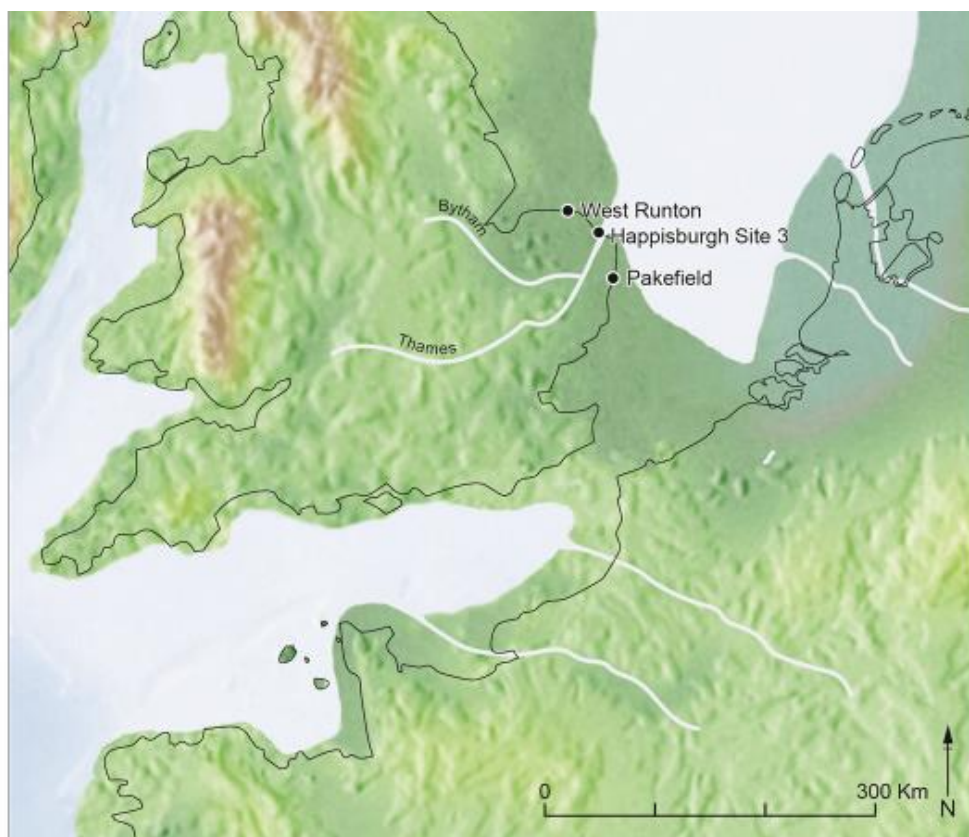
Time (Years BP)	Human evolution 'events'	Palaeolithic (Old Stone Age) periods	Geological Periods	Time as % of last 7,000,000 years
c. 6–7mya	Split of hominins from the Great Apes		Miocene	100%
c. 3.6mya	The Laetoli footprints ( <i>A. afarensis</i> )		Pliocene	51%
c. 3.3mya	1 <sup>st</sup> stone tools (Africa)	Start of the Lower Palaeolithic	Start of the Pleistocene	47%
c. 2.6mya				37%
c. 1.8	1 <sup>st</sup> spreading out of hominins ( <i>H. erectus</i> ) beyond Africa			26%
c. 1.4mya	Hominins spread into Europe			20%
c. 900kya	Hominins reach Britain			13%
c. 300kya	1 <sup>st</sup> appearance of Neanderthals in Europe	Start of the Middle Palaeolithic	End of the Pleistocene	4%
c. 200kya	1 <sup>st</sup> appearance of <i>H. sapiens</i> (in Africa)			3%
c. 50-100kya	<i>H. sapiens</i> begins to spread out beyond Africa			1%
c. 40kya	<i>H. sapiens</i> reaches Europe	Start of the Upper Palaeolithic		0.6%
c. 11.5kya		End of the Upper Palaeolithic		0.2%

Table from [https://blogs.brighton.ac.uk/copingwithclimate/files/2017/09/1\\_3-CopClim-Timeline-table-human-evolution-2680vcs.pdf](https://blogs.brighton.ac.uk/copingwithclimate/files/2017/09/1_3-CopClim-Timeline-table-human-evolution-2680vcs.pdf)

### How did people get to Happisburgh?

Britain hasn't always been separated from mainland Europe. When humans first arrived in Happisburgh, Britain was joined to what is now mainland Europe. It would have been a long journey but people could have walked to Happisburgh.

The map below can be used to introduce the idea of sea level change and to show the land bridge that allowed early humans to walk to Britain. The map shows the current outline of southern Britain overlain on to a map showing how the same area would have looked when humans first arrived in Britain.



Map of southern Britain showing palaeogeography at the time people visited Happisburgh Site 3. © Craig Williams.





Photograph from [Happisburgh Village Website](https://www.happisburghvillage.co.uk/)

### [Suggested Activity- Changing Landscapes](#)

Display a recent photograph of Happisburgh and ask the children the following questions.

Question: Do you think that it would have looked the same when people first came to Britain?

*Answer: No!*

Question: What would have been different?

*Answer: No houses, lighthouse, church etc. No fields or roads. Happisburgh would also not have been at the seaside.*

## What would it have looked like?

The waterlogged anaerobic nature of the Site 3 sediments meant that they provided an ideal environment to preserve fragile organic material including plant remains (e.g. pollen, spores, seeds and wood), insects and even bone. The bone recovered from the site feels heavy because it is partly mineralised and it is this mineralisation that helped it to survive in the site's acidic sediments.

The sediments found indicate that the site was at the edge of a river near an estuary. The different types of animal and plant remains show the regional vegetation consisted of coniferous forest (similar to that found today in southern Scandinavia) and that the local vegetation was a mix of wetland habitats, grassland and alder.

Bone, antler and teeth are rare at Site 3 but the list of species identified includes rhinoceros, southern mammoth, extinct horse, extinct giant elk, Red Deer, extinct giant beaver, extinct water vole, lemming and mouse. Hyaena were present at the site but the evidence for this is not from bones or teeth but from coprolites (fossilised poo!).

Temperatures indicated by fossil beetles suggest that summers at Happisburgh were similar to or slightly warmer than today's, but that winters were probably at least 3 °C cooler.



An artist's reconstruction of Happisburgh Site 3 by John Sibbick  
© 2010 AHOB/John Sibbick

The picture shows a reconstruction of Happisburgh Site 3. Everything in the illustration (with one exception) is based on evidence found at the site. The exception is the spears – wooden objects rarely survive in the archaeological record. However, it is likely that early humans used a whole range of materials. The presence of humans is attested by the presence of stone tools and footprints rather than any skeletal material.

#### Suggested Activity - Animal Hunt

Display the Happisburgh Site 3 [reconstruction drawing](#) and ask the children the following questions.

Question: How many of the animals in the reconstruction can you identify?

*Answer: Animals shown include hyena, giant elk, deer, southern mammoths, horse, giant beaver.*

(You will find information about some of the animals later in this document.)

Question: How do we know which animals were present?

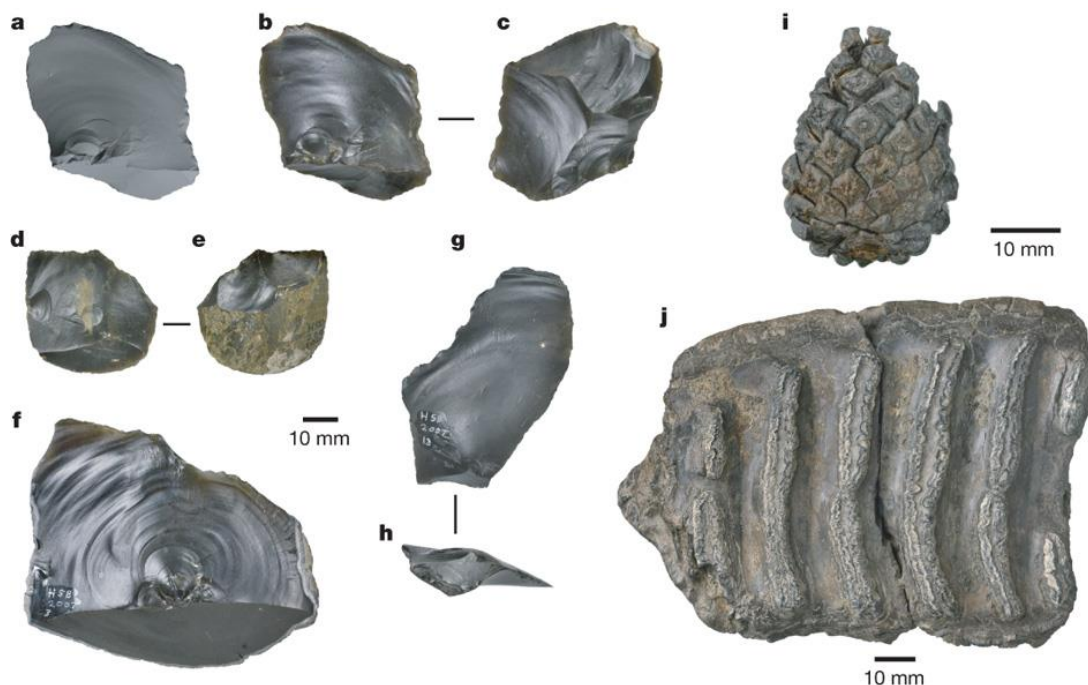
*Answer: Fossilised bone and teeth and, in the case of the hyaena, coprolites (fossilised poo).*

Once you have identified the animals shown in the reconstruction you could divide them into herbivores and carnivores and discuss which of the animals you think would have been the most dangerous for people living in the same area.



## Human Behaviour at Happisburgh Site 3

### The Stone Tools



Flint artefacts and biological remains from Site 3.  
SA Parfitt *et al. Nature* **466**, 229-233 (2010) doi:10.1038/nature09117

Fewer than 100 flint artefacts (stone tools) were excavated from Site 3. The fresh condition of the artefacts shows that they were found more or less where they were used and discarded. The small number of artefacts and the lack of any waste material suggests that they were made elsewhere and brought to the site. The artefacts consist of simple flakes, cores and occasional tools (flakes with further modification).

#### Why was flint used to make the tools?

When flint is knapped (deliberately broken) it produces a sharp cutting edge. Many of the flakes found at Site 3 had a sharp edge opposite the cortex and would have been ideal to use as knives to cut meat or plants.

#### Videos of Knapping

Short videos of experimental archaeologist [Karl Lee](#) making various types of flint artefacts. Videos filmed by John Piprani and available on Vimeo.

- Hard hammer production <https://vimeo.com/209574284>
- Chopping tool <https://vimeo.com/64709128>
- Scraper <https://vimeo.com/80064183>
- Handaxe <https://vimeo.com/64400056>

### The Happisburgh Footprints

The Happisburgh footprints, discovered in 2013, were created as a group of people walked across the soft silts at the edge of an estuary. The footprints are the oldest in northern Europe and provide an incredibly rare snapshot of human behaviour almost a million years ago.

Footprints can be used to estimate the size of the people that made them and the direction in which they were walking. A total of 152 hollows were measured and most show dimensions that fall within the expected range of human footprints. Of these, 12 were exceptionally well preserved and enabled more accurate measurements to be taken. These may have belonged to five individuals, ranging from just under 1 m tall to around 1.7 m tall, suggesting the presence of both adults and children.

The orientation of the footprints suggests the group was walking towards the south with a small number of footprints pointing in different directions. The overall picture we get is of a family walking along the edge of an estuary, with children running around some adults who are leading them inland away from the sea.

You can learn more about the footprints [here](#).



### Suggested Activity – Making and Recording Footprints

Making and recording footprints – an [activity sheet](#) produced by the AHRC-funded project “Coping with climate: the legacy of *H. heidelbergensis*” (University of Reading & University of Brighton), with Schools Prehistory & Archaeology (<http://www.schoolsprehistory.co.uk/>).

## (Some of the) Animals Discovered at Happisburgh Site 3

### Southern mammoth, *Mammuthus meridionalis*

Southern mammoths *Mammuthus meridionalis* were hairless and would have looked a lot like modern elephants. They could grow up to 4m in height, 10 tonnes in weight and have tusks of over 2m in length.

They were adapted to warm climates and arrived in Britain by crossing the land bridge which then linked it to the rest of Europe.

The Happisburgh Site 3 mammoth teeth suggest it was a browser, feeding on leaves from trees and shrubs. As the climate cooled, mammoth teeth changed as they adapted to more abrasive food types like grass.

The woolly mammoth *Mammuthus primigenius* evolved later, as glaciation advanced across Europe.



Mammoths in size order: From the smallest (dwarf mammoth – yellow), to the largest (steppe mammoth – black). The Site 3 southern mammoths (dark blue) come in at a close second! (Image [Public Domain](#))



### Extinct giant beaver, *Trogontherium cuvieri*

The extinct giant beaver had massive incisors (front teeth) that could grow to around 18cm! They may have used their oversized teeth for digging at roots or for burrowing into the ground.



FIG. 7. — Reconstructed life appearance of *Trogontherium cuvieri* Fischer de Waldheim, 1809 (drawing by A. Holda-Michalska).

[https://twilightbeasts.files.wordpress.com/2017/11/trogontherium\\_recon.jpeg](https://twilightbeasts.files.wordpress.com/2017/11/trogontherium_recon.jpeg)

### Extinct giant elk, *Cervalces latifrons*

*Cervalces latifrons* was first named in 1874 from a frontal bone attached to part of an antler discovered on the beach at Happisburgh. These magnificent creatures are estimated to have averaged 2.1 m high at the shoulder and weighed around 1,000 kg. Their antlers, whilst not as wide as those of the giant Irish elk, spanned up to 2.5 m.



By Ghedoghedo - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=28929592>

## About us

The [Pathways to Ancient Britain](#) (PAB) project focuses on three chronological periods of human presence in the British Isles, from the earliest occupation (found at Happisburgh!) through to extinction of the Neanderthals and the emergence of modern humans. In partnership with North Norfolk District Council and Norfolk Museums Service the PAB project is currently working with local collectors to record finds at Walcott and Bacton following the recent Sandscaping works. If you are interested in finding out more about this project please visit our [website](#).