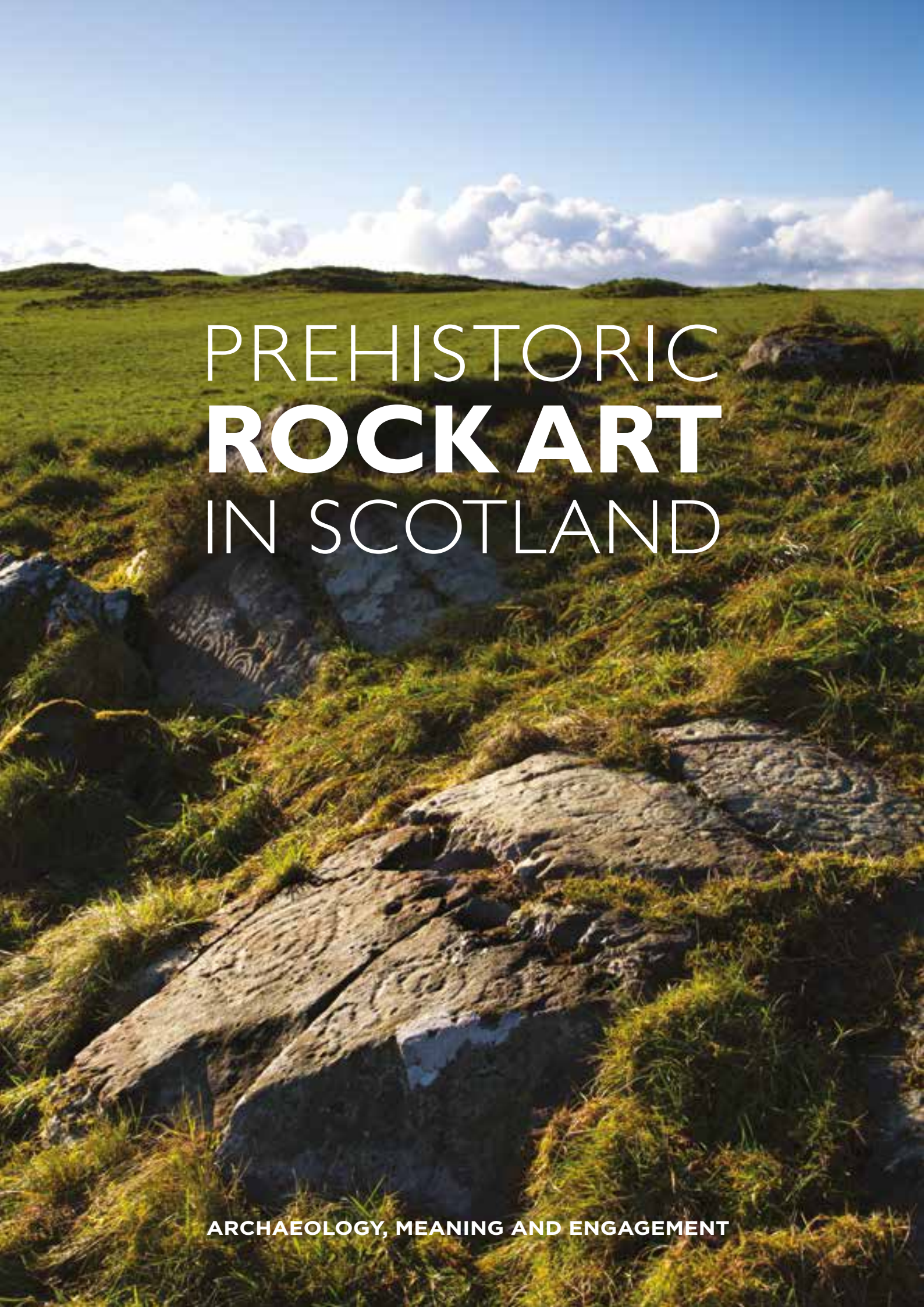
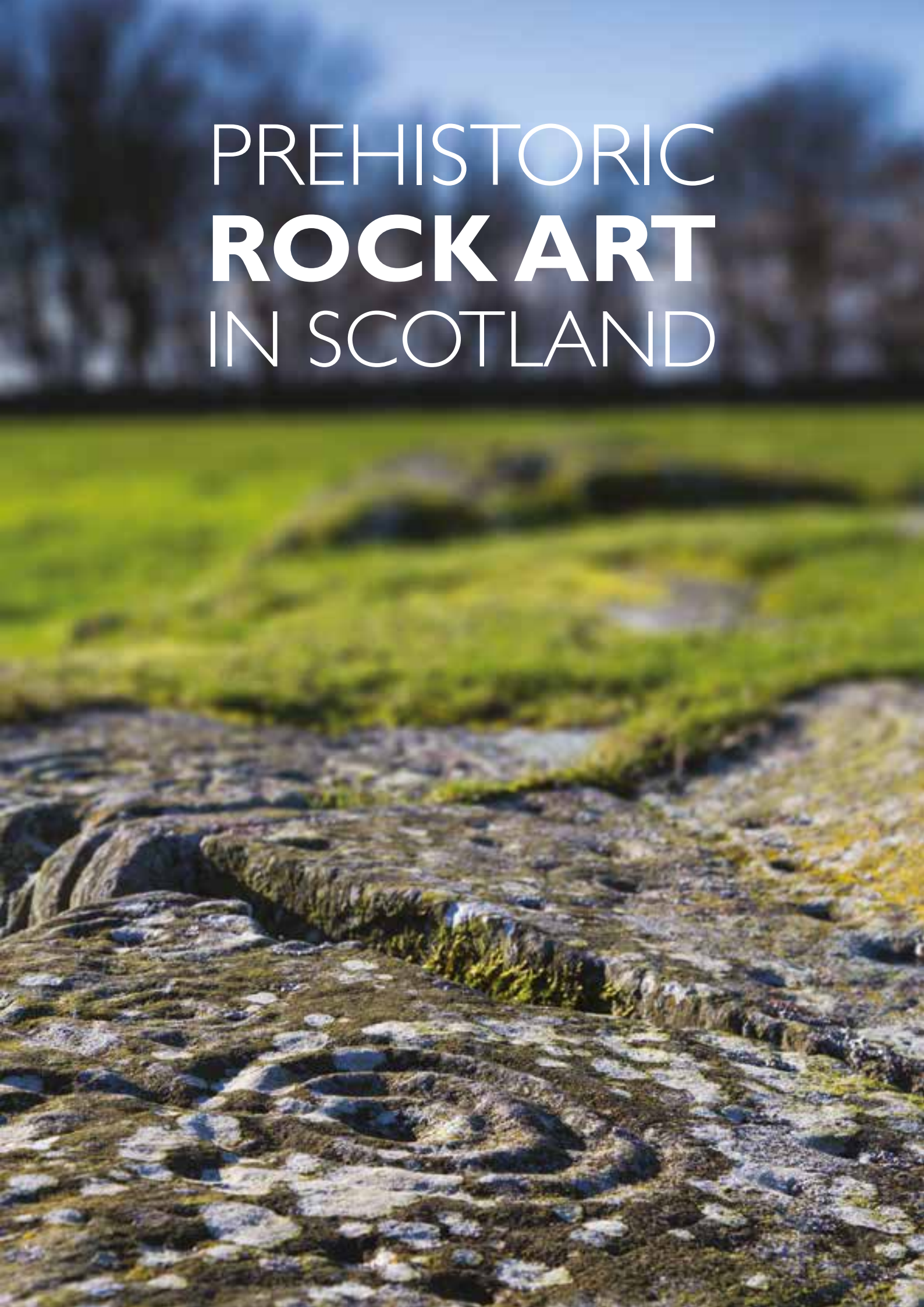


PREHISTORIC ROCK ART IN SCOTLAND

ARCHAEOLOGY, MEANING AND ENGAGEMENT



PREHISTORIC **ROCK ART** IN SCOTLAND

Published by Historic Environment Scotland 2021

Printed on sustainable materials

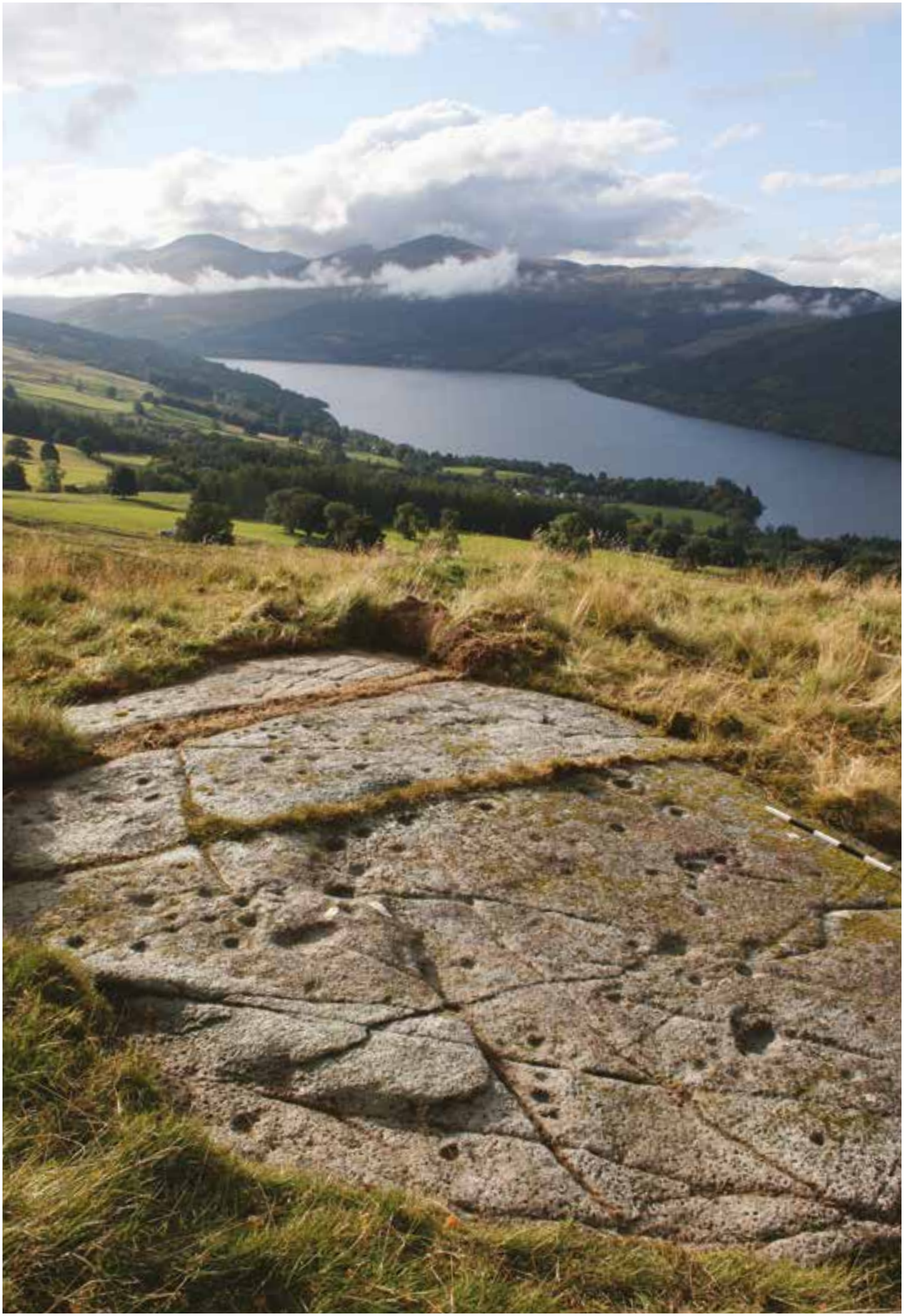
The booklet was written by Tertia Barnett, Joana Valdez-Tullett, Linda Marie Bjerketvedt, Frederick Alexander, Stuart Jeffrey, Guillaume Robin and Maya Hoole

Designed by Chris Bell

Printed in Scotland by J Thomson Colour Printers Ltd, Glasgow

Front cover: Knock, Dumfries and Galloway ©HES
Title page: Drumtroddan, Dumfries and Galloway ©HES

CONTENTS



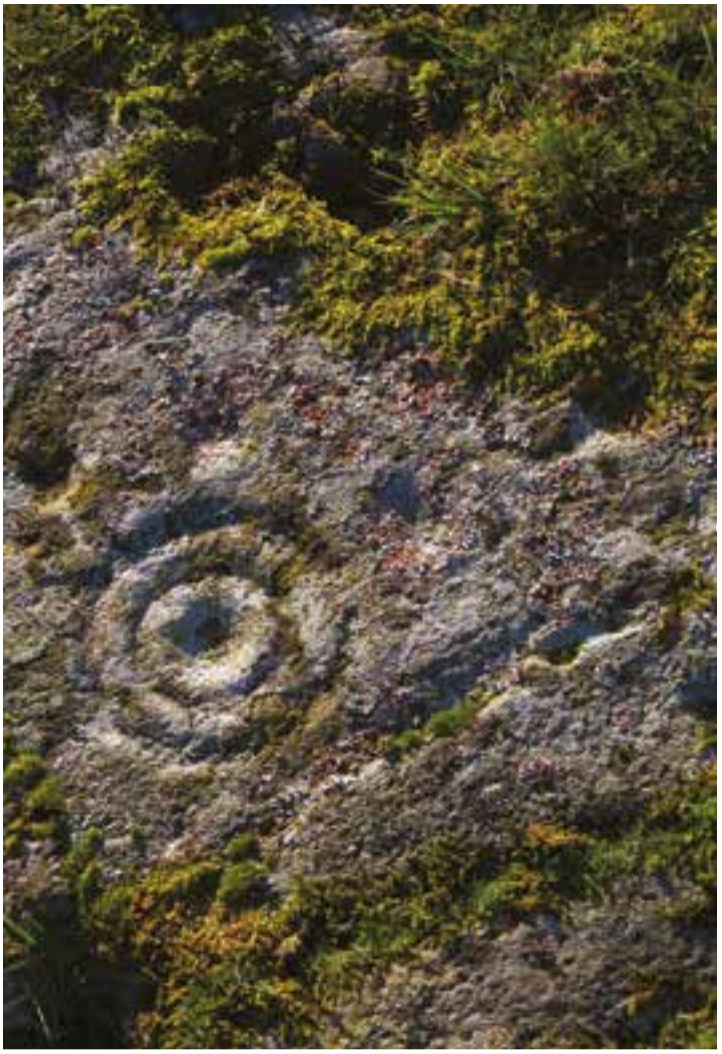
INTRODUCTION

This booklet aims to widen understanding and appreciation of prehistoric rock carvings in Scotland. Rock art forms some of the most prolific, fascinating, and inspiring fragments of Scotland's ancient past. It captures a wealth of information about the people who created it, the world they lived in, and the beliefs they held in order to make sense of that world. There is still much to learn about Scotland's rock art, but investigations over the last two decades have helped us understand more about its significance to people in the past and its value to us today.

In the following pages, we provide an overview of rock art in Scotland, its connections with other parts of Britain and Europe, and its treatment today. In the first two sections (**About Rock Art** and **Rock Art and Meaning**), we emphasise the uniqueness of Scotland's rock art and explore the key questions surrounding it: What is it? Where is it? How old is it? Who made it? And, above all, what does it mean? In the third section (**Rock Art Today**), we highlight the importance of recording, preserving and celebrating the rock art that survives today to ensure future understanding, community engagement, and cultural identity. There is much more to say about rock art than we can possibly fit into this booklet and, in the final section, we offer suggestions for where to find out more and where to visit rock art in the landscape, in museums, and online.

OPPOSITE: **Balmacnaughton 2, one of several prehistoric carved rocks on a hillock overlooking Loch Tay, Perthshire** ScRAP©HES

BELOW: **Grange 1 near Kirkcudbright, Dumfries and Galloway** ScRAP©HES



CLOCKWISE FROM TOP LEFT:

Drumtroddan, Dumfries and Galloway ©HES

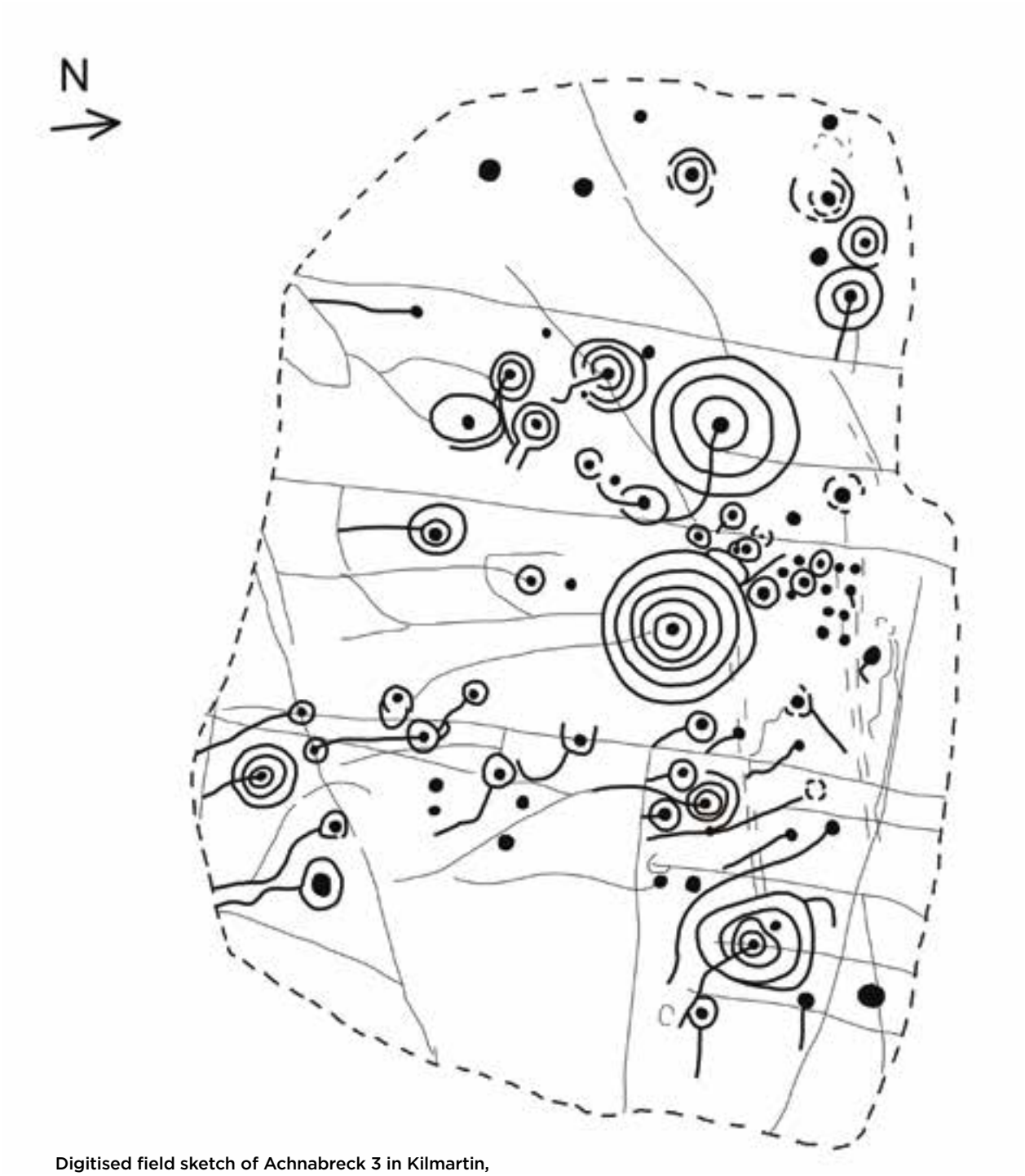
Drumtroddan, Dumfries and Galloway ©HES

Ardifuir 6, near Kilmartin, Argyll ScRAP©HES

Knock, Dumfries and Galloway. Part of a cluster of prehistoric carved rocks now buried beneath rubble ©HES

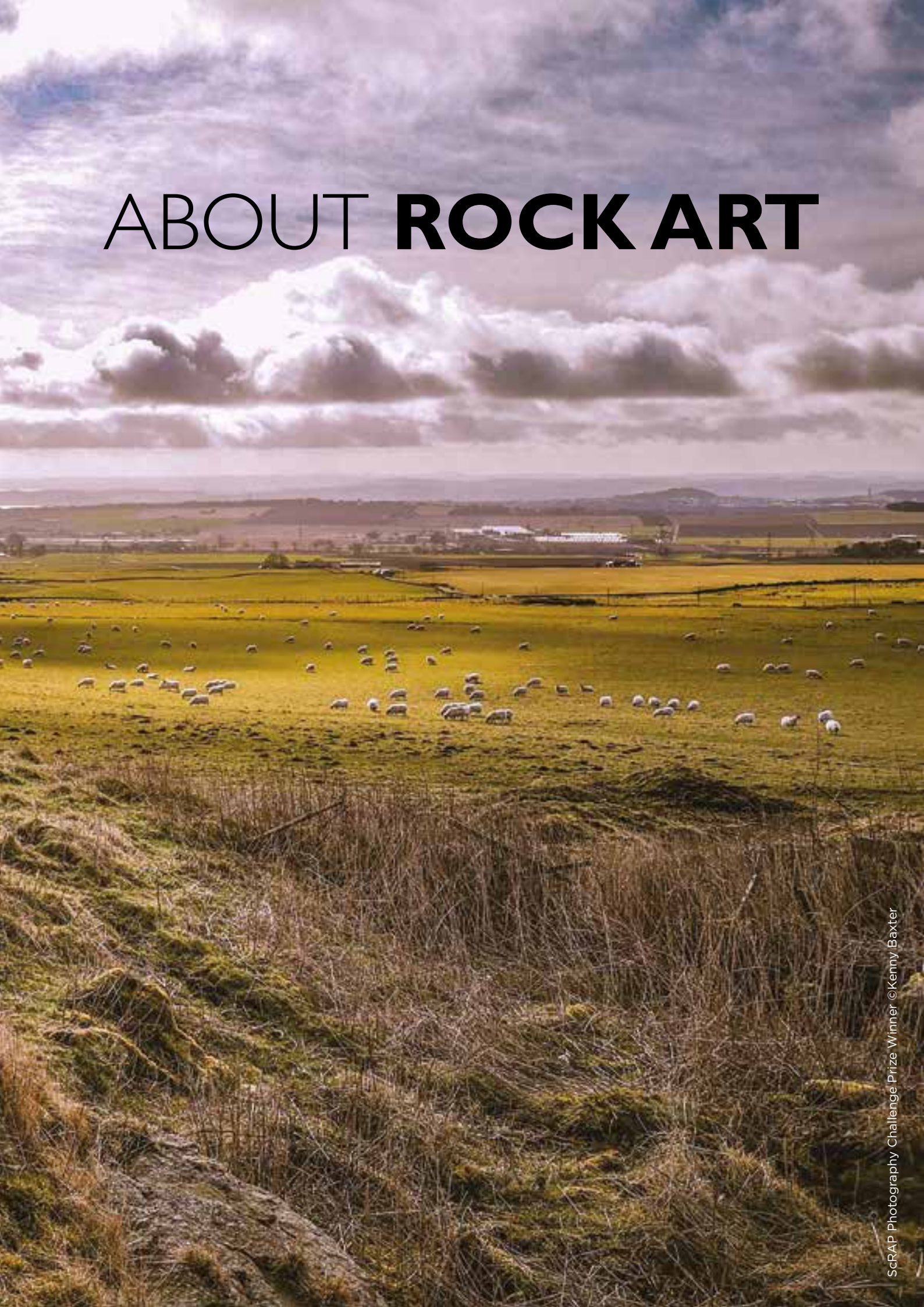
Newlaw Hill 1, Dumfries and Galloway ScRAP Kirkcudbright Team ©HES

This booklet has been produced and published by Scotland's Rock Art Project (ScRAP), a five-year programme working with communities across the country to record, research and raise awareness of prehistoric rock carvings. The project was funded by the Arts and Humanities Research Council between January 2017 and December 2021. ScRAP was based at Historic Environment Scotland and worked in collaboration with Edinburgh University, School of History, Classics and Archaeology, and Glasgow School of Art, School of Simulation and Visualisation. The project was partnered by Archaeology Scotland, Kilmartin Museum, and the North of Scotland Archaeological Society.

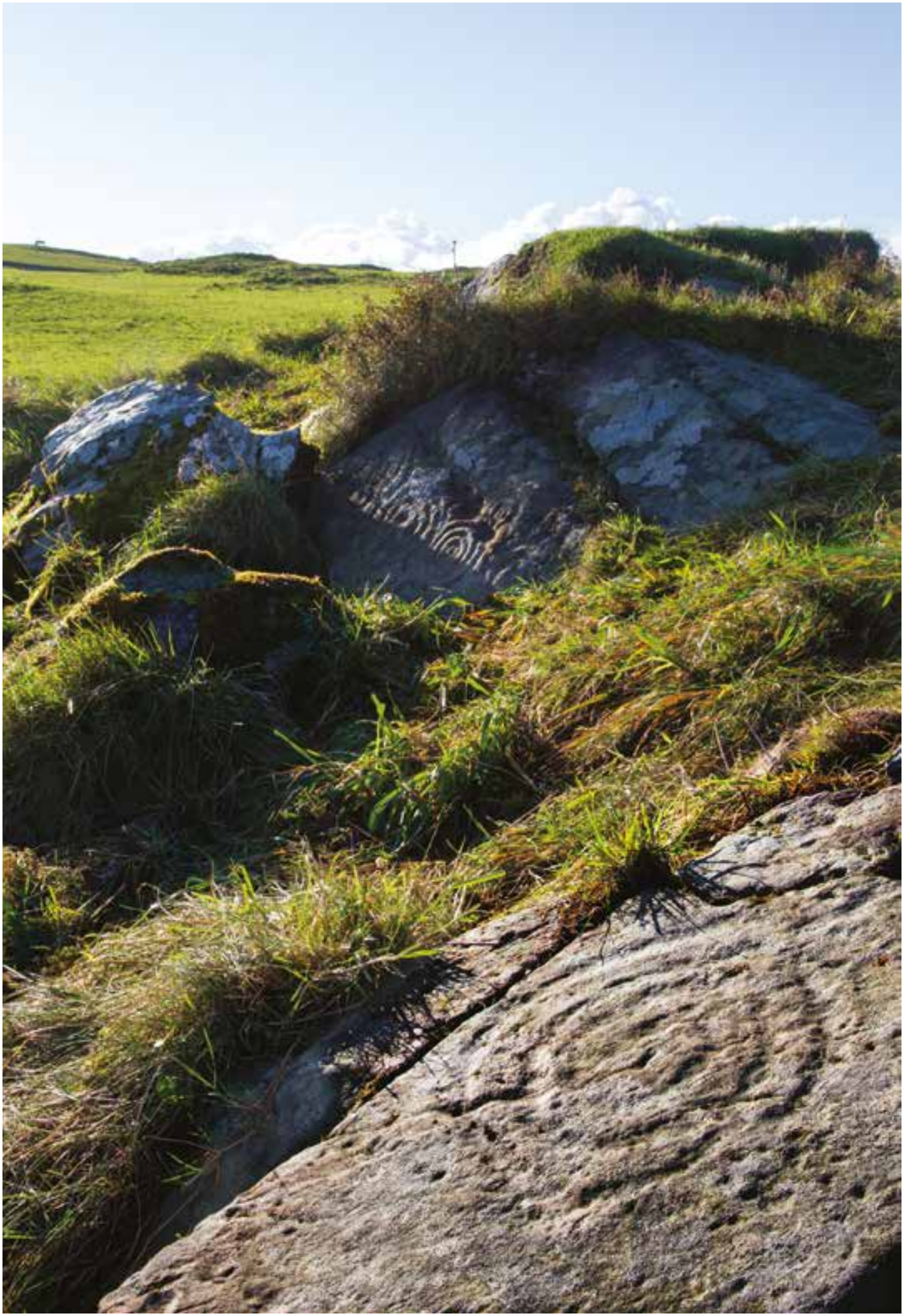


Digitised field sketch of Achnabreck 3 in Kilmartin, Argyll, created by Scotland's Rock Art Project, showing the carvings and rock surface features
ScRAP©HES

ABOUT **ROCK ART**



ScRAP Photography Challenge Prize Winner ©Kenny Baxter



WHAT IS ROCK ART?

The term ‘rock art’ refers to marks with no known functional origin that are painted or carved onto natural rock surfaces. People have been producing rock art all around the world for over 40,000 years, and it is still made or used in certain places today, such as the Kimberley region of Australia. There are estimated to be at least 50 million surviving rock art images in the world. These have been made deep within caves, in natural rock shelters, and on rocky outcrops and boulders in the open air. Rock art is best known for the magnificent cave paintings of wild animals created in France and Spain during the last Ice Age, around 40,000–12,000 years ago, but most of the world’s rock art was created in the landscape after the Ice Age.

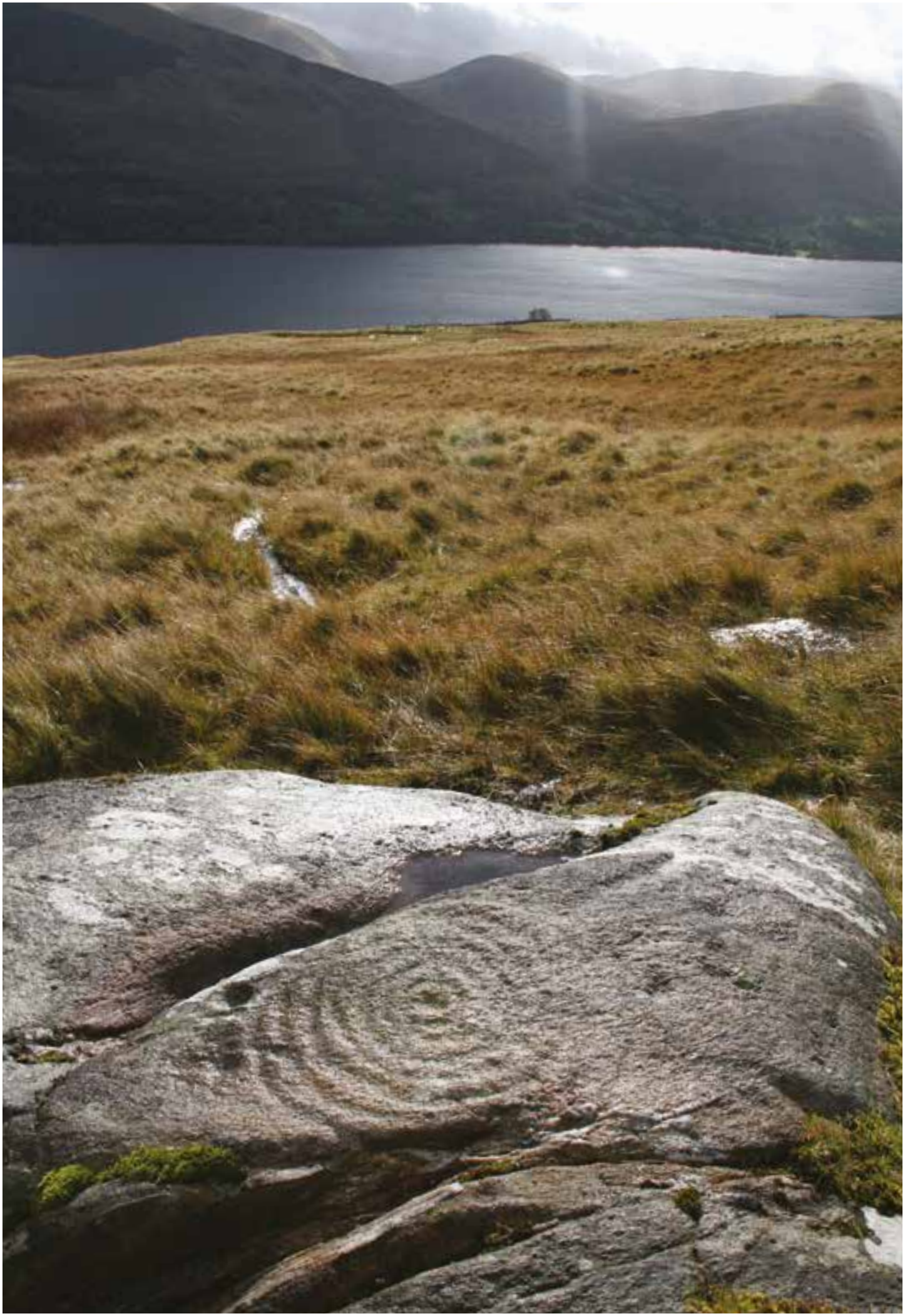
There are two main types of rock art. ‘Figurative’ rock art depicts things we can identify, particularly wild or domesticated animals, although images of people and objects, such as boats, weapons, or houses, are also common. Interestingly, over half of the world’s rock art comprises symbols (‘motifs’) that do not resemble anything recognisable to us – this is called ‘abstract’ rock art.

Abstract rock art is incredibly varied, ranging from simple shapes, like lines or circles, to elaborate and complex forms that often cover an entire rock surface. These motifs were undoubtedly meaningful to the people that made and viewed them, and they capture a wealth of information about past beliefs and values. Their abstract nature makes them challenging for us to understand and appreciate today, and this type of rock art is often overshadowed in public awareness and academic research by more impressive and recognisable figurative images.

OPPOSITE: **Knock, Dumfries and Galloway** ©HES

ABOVE: **Close-up of cup-and-ring motifs at Ballochraggan 7, Port of Menteith, Stirlingshire** ScRAP©HES

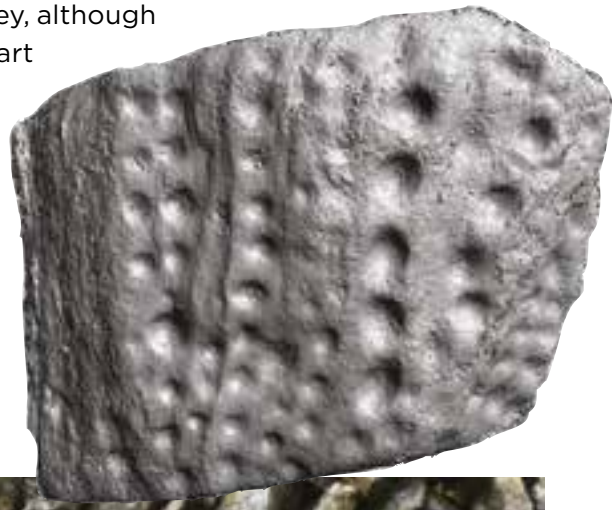
LEFT: **3D model of cup-and-ring marked rock Townhead 1, near Kirkcudbright, Dumfries and Galloway** ScRAP©HES



ROCK ART IN SCOTLAND

Rock art in Scotland is almost entirely abstract, and formed mainly from circular motifs carved into the rock. The carvings are thought to have been created between around 4,000 and 6,000 years ago during the Neolithic and Early Bronze Age, but may also have been significant in later prehistoric periods and more recently. Very similar motifs were also created at this time elsewhere in Britain and Atlantic Europe – you can read more about these later in this section.

Over 3,000 prehistoric carved rocks (called 'panels') are known in Scotland today. More are discovered every year – almost a thousand have been recorded in the last decade – and it is likely that many further carvings have yet to be found. A large quantity of rock art has been destroyed or eroded away over time, and the total number of panels may have originally run to tens of thousands. Most of the carvings are on boulders and outcrops scattered across the landscape. Less frequently, they are associated with prehistoric monuments, or re-used in medieval and later structures such as field walls and gateposts. A large number of carved stones have also been recovered from excavations of Neolithic buildings in Orkney, although these differ from the vast majority of rock art in Scotland.



OPPOSITE: **Cloanlawers 1 on the south-facing slope of Ben Lawers overlooking Loch Tay, Perthshire** ScRAP©HES

RIGHT: **3D model of cup marked stone Tombreck 1 on the slopes of Ben Lawers, Perthshire** ScRAP©HES

BELOW: **Cup-and-ring marked stone built into a field wall at Whiteside Bridge, Dumfries and Galloway** ©Nic Coombey

WHAT DO THE CARVINGS LOOK LIKE?

By far the most common type of prehistoric carving in Scotland is the **cupmark** – a roughly circular hollow in the rock surface, usually 2–6cm wide and 0.5–3cm deep. Cupmarks are often surrounded by one or more concentric rings, forming **cup-and-ring markings**. Also common are linear motifs, or **grooves**. These basic motifs – cups, rings and grooves – have numerous subtle variations, combinations and arrangements, such as rosettes (a circle of cupmarks surrounded by a ring or circle of cupmarks), or pennanulars (a central cupmark surrounded by one or more incomplete rings, often with a radial groove extending from the cupmark). Far from being simple and repetitive, these motifs can be assembled into incredibly elaborate and complex designs, and each carved rock is unique.

Cup-and-ring motif with three penannular rings and two radial grooves. The Binn 1, Fife ©Joana Valdez-Tullett

CLOCKWISE FROM TOP LEFT:

Cups with single or multiple rings and radial grooves. Drumtroddan, Dumfries and Galloway ©HES

Arrangement of cupmarks and grooves. Ardoch, Highland ScRAP NOSAS Team ©HES

Linear arrangement of cups, some with short radial grooves, and a cup with single ring. Grange 7, Dumfries and Galloway ScRAP Kirkcudbright Team ©HES

Multiple cups arranged around a cup with four rings. High Banks 4, Dumfries and Galloway ScRAP©HES

Central cup with multiple gapped rings intersecting with other cups and cup-and-ring motifs. Tormain Hill 1, Midlothian ScRAP ELF Team ©HES

This stone from Kirkdale House, Dumfries and Galloway, features large cups with small rings and grooves. The motifs are both pecked and ground ScRAP©HES

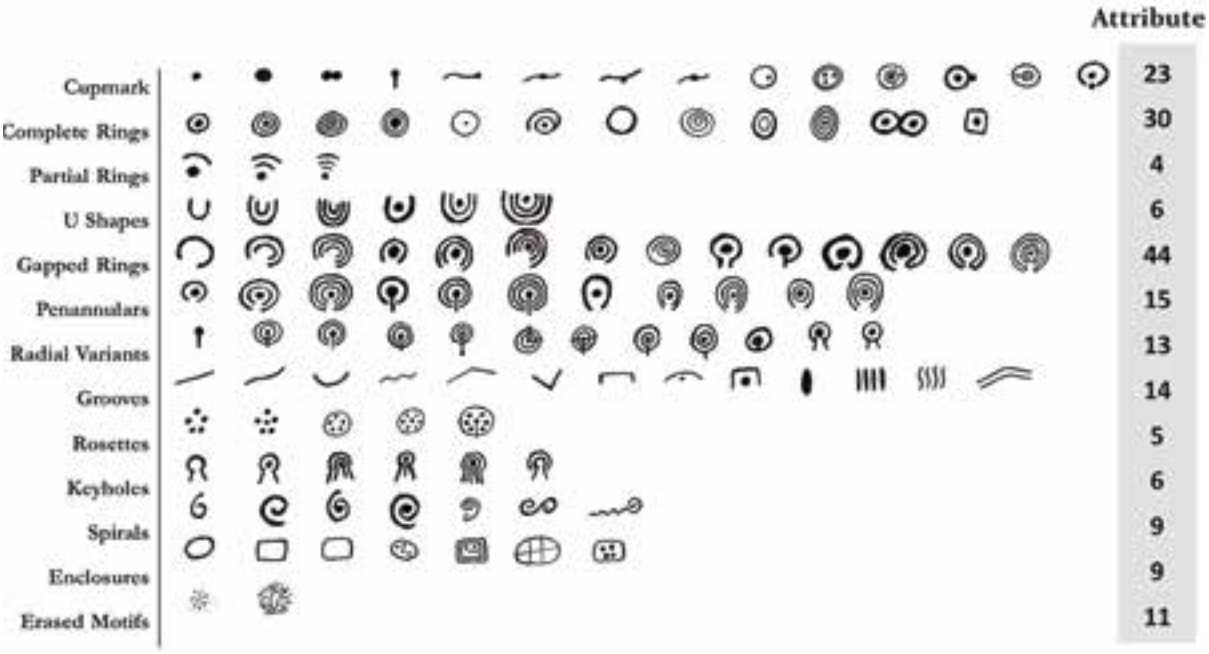
There are numerous subtle variations in cup-and-ring motifs, such as this 'clover-leaf' design at Grange 1, Dumfries and Galloway ScRAP©HES

Carvings can be elaborate and cover the whole rock surface, such as at Craikness Hill 1, Dumfries and Galloway ScRAP©HES

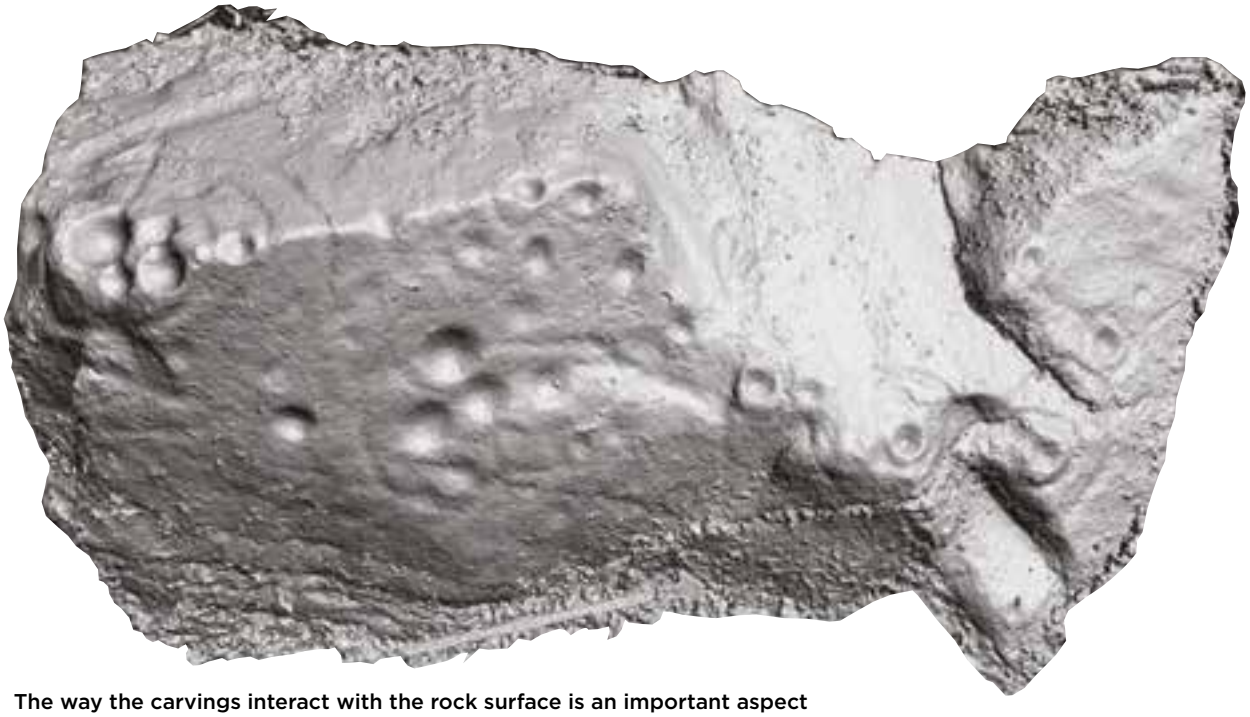
ABOVE: **Although certain panels, such as Newlaw Hill 1, Dumfries and Galloway, show considerable variation in the size of cups and rings, motifs on individual rock surfaces are usually of similar scale** ScRAP Kirkcudbright Team ©HES

RIGHT: **Some motifs are very rare, like these rosettes at Townhead 18, Dumfries and Galloway** ScRAP©HES

The carvings also often incorporate the shape, texture and natural features of the rock surface into the design. This was deliberate, suggesting that the rock itself was important to the people that made the motifs, and that certain rocks may have been selected for carving because of their particular characteristics. The types of motifs used, the way they are arranged, and their relationship to the natural rock surface vary across Scotland. You can find out more about this in **Analysing Scotland's Rock Art**.



This chart illustrates the different categories of rock art motifs, each with multiple variants (numbered in the right-hand column). Detailed examination of rock art panels reveals subtle differences in the motifs and their arrangement in relation to the rock surface ScRAP©HES



The way the carvings interact with the rock surface is an important aspect of their character. At Glassie 1, Perthshire, the motifs are integrated into the three-dimensional shape of the rock ScRAP©HES

ROCK ART IN THE LANDSCAPE

Scotland's rock art is not evenly distributed across the country. It is especially concentrated in parts of Argyll and Bute, around the south coast of Dumfries and Galloway, and in Perthshire and Inverness-shire. Smaller clusters of carved rocks are known in areas like Angus, Aberdeenshire, and the islands of Bute and Tiree, whereas regions such as North West Highland and the Scottish Borders have almost no rock art at all. Today's distribution may not accurately reflect the spread in prehistory, however, because it is biased

Blarnaboard 1, Stirlingshire ScRAP Callander Team ©HES

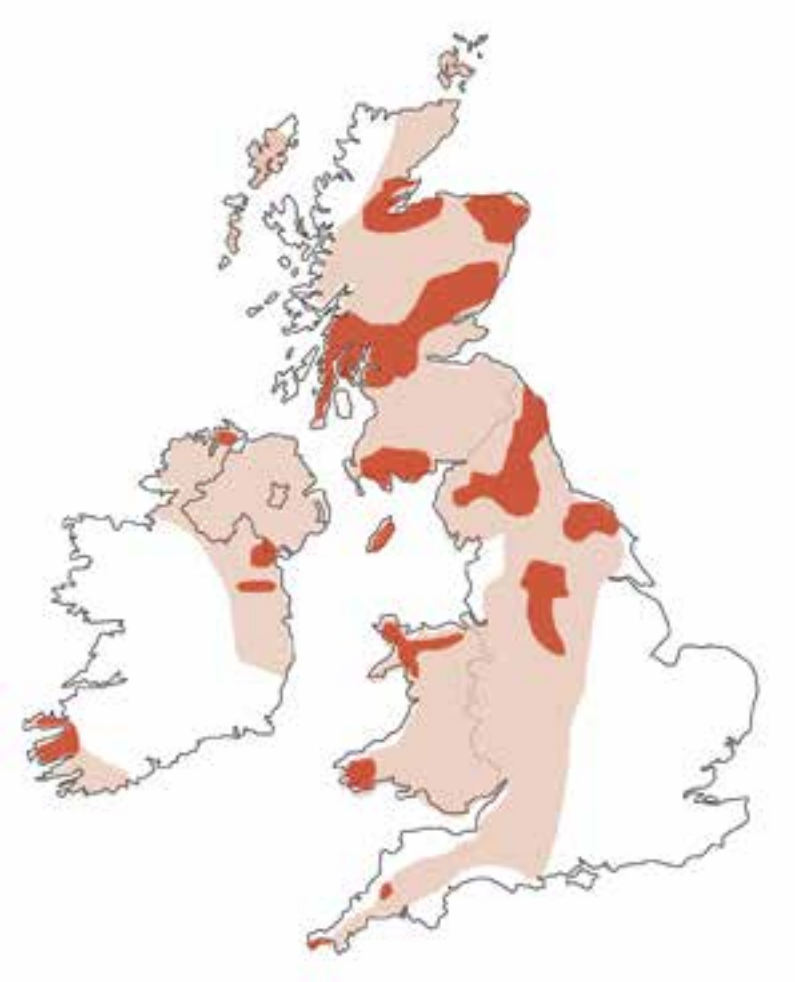
by patterns of survival and discovery. A large quantity of rock art has been destroyed over time through quarrying, agriculture, and urban construction, and it is more likely to survive in places with less intensive land use. Gaps may also reflect areas that have not been surveyed intensively, or where the carvings are hidden by peat, turf or woodland.

The motifs are typically carved on boulders and outcrops in the open air. They tend to be on flat or gently sloping rock surfaces, although there are a few examples on vertical rock faces, such as at Ballochmyle in Ayrshire. Scotland has a diverse geology, and many different rock types have been used for carving, ranging from soft, fine-grained sandstones to hard, coarse-grained Lewisian gneiss and granites. In general, harder rocks tend to have simpler motifs, whereas softer rocks like sandstone are often more elaborately carved, but this is not a definitive rule.

Carved rocks, or 'panels', are generally found in the sorts of places where people would have lived, farmed and herded domestic animals in the past – on hillsides, open moorland and around the edges of fertile river valleys and arable land, rather than in remote mountain regions. This pattern is accentuated in Highland Scotland where arable land is more restricted and defined by the mountainous terrain. Interestingly, rock art tends to be situated in areas that, today at least, have less productive soils and may have been less attractive for growing crops in the past. Panels are rarely found on the edges of today's shoreline, possibly because prehistoric sea levels were higher than present around parts of Scotland.

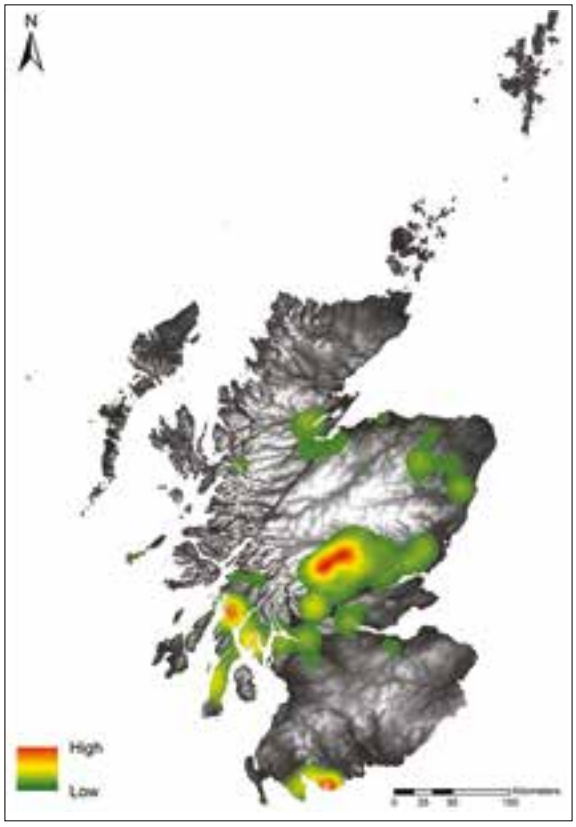
DISTRIBUTION MAP OF ROCK ART IN BRITAIN AND IRELAND

Dark areas show high concentrations of rock art, light areas show low concentrations of rock art. Map created by ScRAP



BELOW LEFT: **The vast majority of rock art in Britain and Ireland is on flat or gently sloping surfaces. Carvings on vertical rock faces are extremely rare, and Ballochmyle in Ayrshire is one of the few known examples** SC674680©Crown Copyright: HES

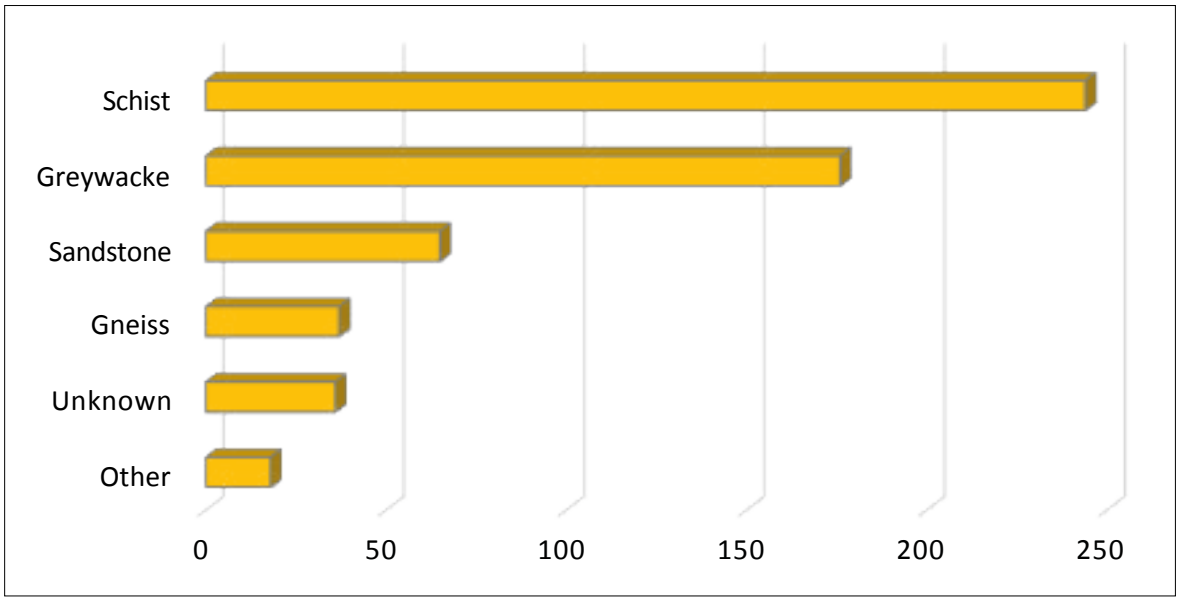
BELOW RIGHT: **Rock art is very vulnerable to destruction from quarrying and land-use. The Witches Stone near Ratho, Midlothian, was blown up by the land-owner in 1931 to create more arable land.** ©Courtesy of HES (Reproduced with kind permission from Society of Antiquaries of Scotland). See image credits



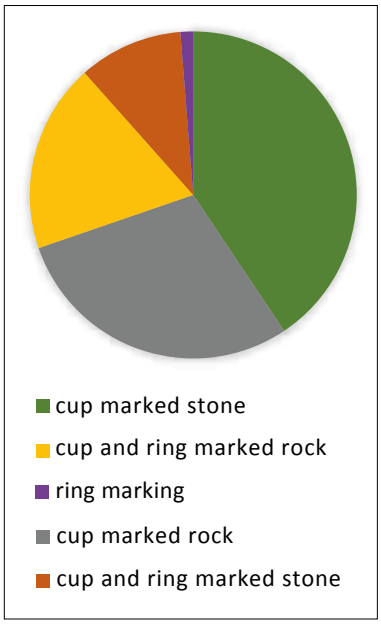
Density map of rock art in Scotland, showing the main areas of concentration in red centred around Loch Tay (Perthshire), Kilmartin (Argyll) and Kirkcudbright (Dumfries and Galloway). See image credits

Distribution map of rock art in Scotland (red dots), illustrating the uneven spread of panels and areas that appear to lack rock art. See image credits

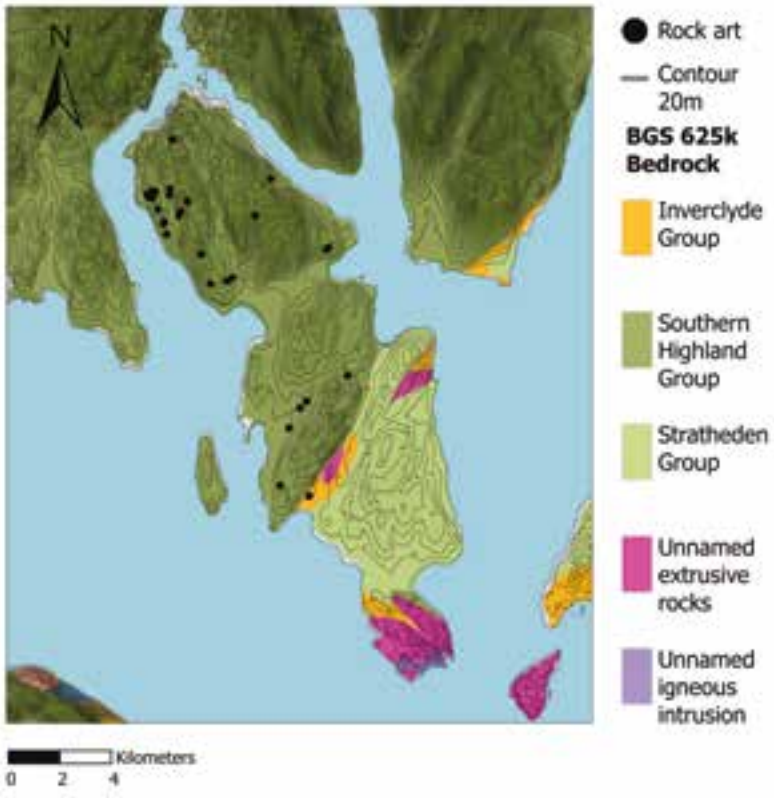
Rock art is often located on the fringes of farmland land, like Grange 3, Dumfries and Galloway ScRAP©HES



Prehistoric carvings are found on a wide range of rock types across Scotland, but most frequently on schist, greywacke (metamorphosed sandstone) and sandstone. Interestingly, hard rocks like gneiss and granite were also used

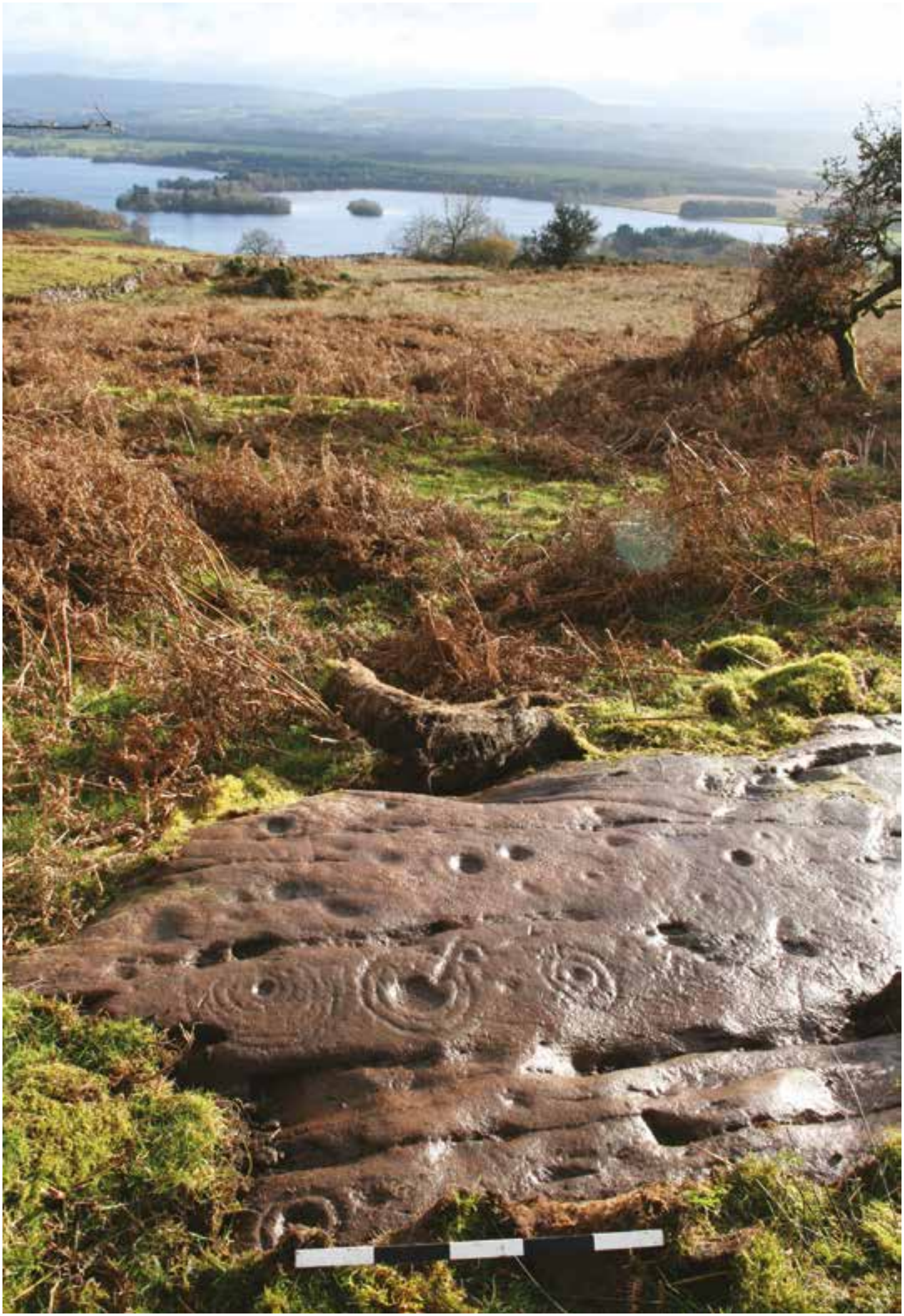


Cup marked rocks and stones are far more common than cup-and-ring marked rocks and stones, and represent the majority of rock art in Scotland



ABOVE: **Distribution of rock art in the Isle of Bute in relation to the bedrock geology. In this case, the panels are almost exclusively located on schist bedrock in the northern half of the island (dark green on the map), rather than on the softer sandstone in the south. Other areas of Scotland show a less well-defined relationship between the rock art and geology.** See image credits

OPPOSITE: **Sandstone is one of the preferred rock types for carving in Scotland and often features elaborate motifs, as at Ballochraggan 7, Stirlingshire** ScRAP©HES



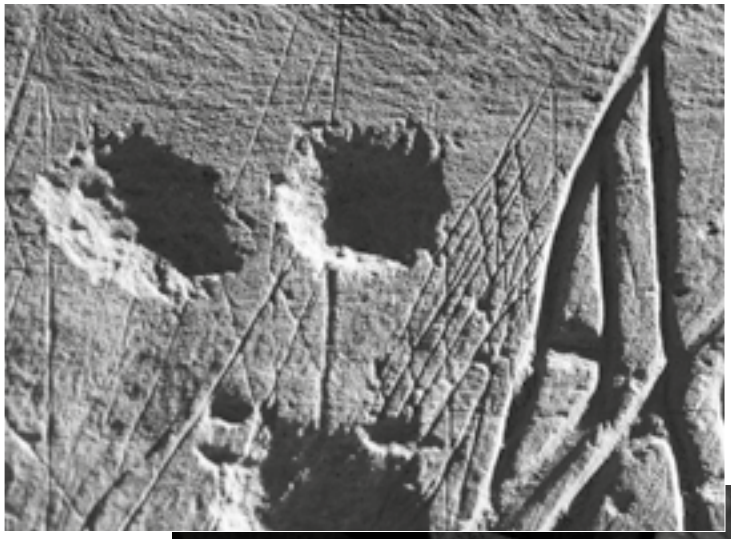
ROCK ART IN STRUCTURES

Rock art in Scotland is sometimes associated with Neolithic and Early Bronze Age monuments, such as burial cairns, stone circles, and standing stones. In some cases, the motifs are eroded or broken and appear to have been deliberately quarried from carved rock outcrops in the landscape for re-use in the monument. In other instances, the carvings are very fresh and were probably made specifically to be placed in the monument when it was constructed.

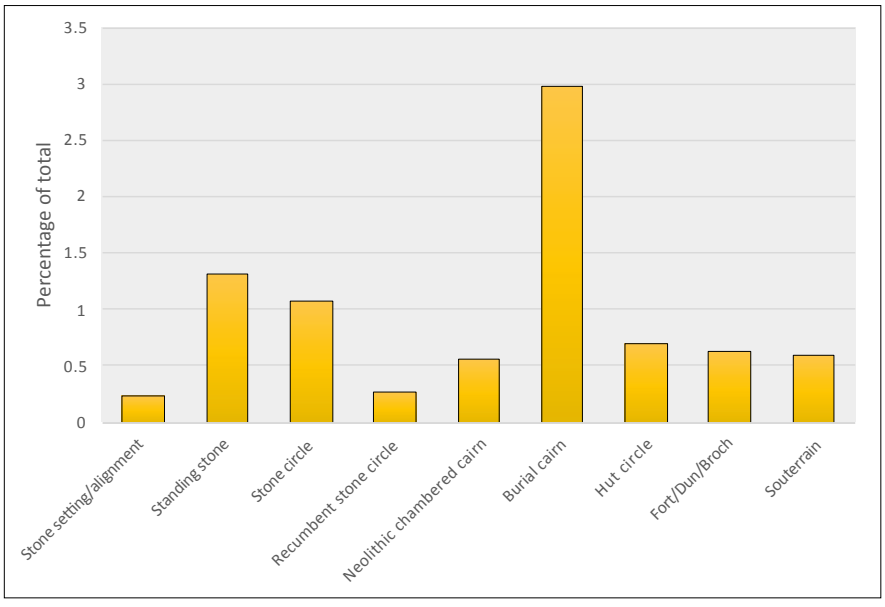
Cup-marked and cup-and-ring marked stones are also found in later prehistoric structures, such as Iron Age hillforts, brochs, and souterrains. While this could be coincidental use of available building material, the stones often seem to be deliberately positioned in entrances and other important parts of these structures. This could suggest that rock art held long-lasting significance for these later communities, or that its re-use was a symbolic revival of ancient values – or maybe they simply enjoyed looking at the designs. Carved stones and fragments of larger carved rocks are frequently incorporated into more recent features, including field walls and houses, although this re-use is perhaps less about the meaning of the carvings and more about their visual attractiveness and the usefulness of the stone.

ABOVE: **Rock art is occasionally built into the walls of houses and barns, possibly for decorative reasons, such as at Old Downie, Angus** SC1449603©Crown Copyright: HES

RIGHT: **Prehistoric standing stones sometimes feature rock art on one or more of their faces. The carvings on the central standing stone at Nether Largie in Kilmartin, Argyll include cups and cup-and-ring motifs, although standing stones more usually only have cupmarks** ©Tertia Barnett



In Orkney, numerous stones mainly with incised linear markings have been recovered from Neolithic domestic structures at Skara Brae and, more recently, at the Ness of Brodgar, where over 1,000 carved slabs have been identified during excavations. These carvings, which are often very faint, appear to have been created deliberately for inclusion within the architecture of buildings. Their form, technique and context differ from cup-and-ring markings, and their density and variety are unparalleled in Britain.



ABOVE TOP: **Close up of a carved stone from the Ness of Brodgar excavations showing the intricate working, varied carving techniques, and sequences of carving activity** ©Antonia Thomas

ABOVE BOTTOM: **Fine linear incised motifs revealed during excavation of buildings at Ness of Brodgar** ©Antonia Thomas

LEFT: **Percentages of the total 3,100 rock art panels in Scotland associated with prehistoric monuments, ranging from Neolithic ritual and funerary monuments to Iron Age souterrains, forts, duns and brochs**

Multiple cups and cup-and-ring carvings on the recumbent stone in Rothiemay Recumbent Stone Circle, Aberdeenshire. The stone has been shown to align with significant astronomical events DP00092734©Crown Copyright: HES

Cup-and-ring marked stone built into the Iron Age souterrain at Tealing, Angus. The stone is thought to have been deliberately placed just inside the entrance to the subterranean passage ScRAP©HES

A SHORT HISTORY OF DISCOVERY AND RESEARCH

From around 200 years ago, growing interest in antiquities and ancient monuments led to the first studies of prehistoric rock art in Scotland. The 19th century 'pioneers' of rock art research included Sir James Young Simpson, Canon Greenwell, and John Romilly Allen, who all published accounts and detailed drawings of the carved stones. The work of Simpson, a Scottish aristocrat and doctor, is particularly valuable, and unusual for its time, because his descriptions of the carvings include information about their settings, local geology, and natural features on the rock surface.

Cup-and-ring carvings on two faces of a stone from Letham Grange souterrain, Angus, one of many beautiful rock art illustrations published by Simpson in the late 19th century. ©Courtesy of HES (Reproduced with kind permission from Society of Antiquaries of Scotland). See image credits

Simpson's synthesis of Scotland's rock art in the 1860s mentions at least 77 carved rocks, and notes their resemblance to rock art in England, Ireland, and other parts of the world. He also proposes several interpretations for what the carvings meant, ranging from landscape maps and astronomical charts, to an early form of writing and gaming boards. By the 1880s, 204 rock art sites were known in Scotland according to an article

19th century drawing of Cairnbaan 4 in Kilmartin, Argyll by C. Maclagan. Cairnbaan was one of the first published examples of rock art in Scotland DP285130©Courtesy of HES (Society of Antiquaries of Scotland Collection). See image credits

published by Romilly Allen. From the early 1900s, the number of rock art discoveries rose steadily through systematic fieldwork by the Royal Commission on Ancient and Historical Monuments of Scotland (RCAHMS) and the Ordnance Survey.

Arguably the greatest contribution in the past 70 years has been from independent researchers. Most renowned amongst them is Ronald Morris, a Scottish lawyer who recorded over 400 rock art sites across southern and western Scotland in the 1960s–1980s. Morris famously compiled a list of

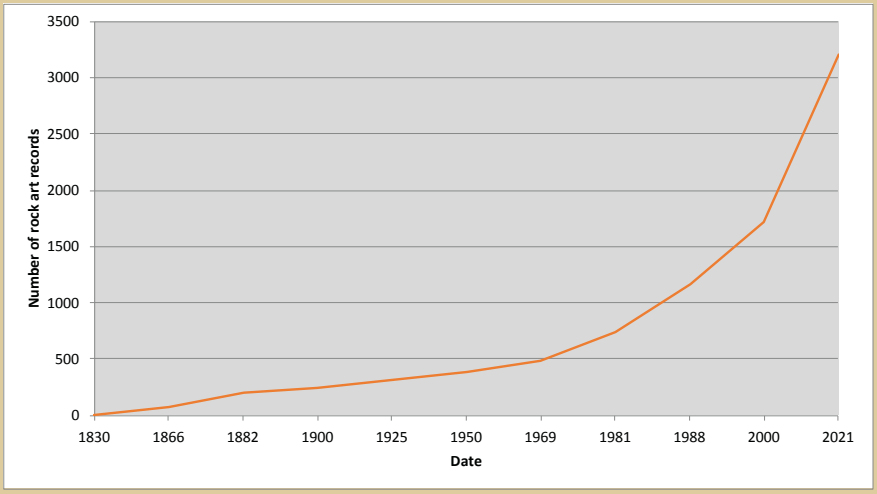
Lurgan Farm 1, Perthshire, one of over 700 panels discovered by George Currie and added to Canmore. The panel was subsequently 3D modelled by ScRAP ©HES

104 theories about what rock art meant (you can find some of these in the section on **Rock Art and Meaning**), and was one of the first people to study the relationship between rock art and the landscape. Other specialists, including Marion Campbell, Maarten van Hoek, and Dorothy Marshall, enriched the growing database of Scotland's rock art. By the year 2000, the National Record for Scotland's Historic Environment (**Canmore**) contained almost 1,500 rock art records. In the last two decades, the map of Scotland's rock art has been redrawn by George Currie, who discovered over 700 rock art sites across the country within the space of 10 years. The work of these and many other highly committed individuals and groups has shaped our knowledge of Scotland's rock art today.

Cup-and-ring marked stone at Whitelaw Hill, East Lothian, discovered by Douglas Ledingham from the Edinburgh, Lothians and Fife ScRAP Team ©HES

ABOVE: **Marion Campbell, shown here, made a phenomenal contribution to our knowledge of rock art and archaeology in Argyll** ©Kilmartin Museum Company Ltd

When Scotland's Rock Art Project (ScRAP) started in January 2017, Canmore contained 2,450 rock art records. By late 2021, this number had increased to 3,100 as a result of fieldwork by trained community teams working with ScRAP. This work has also revised our understanding of the distribution of rock art within Scotland. Areas such as Inverness-shire and Tiree, where little rock art had been found previously, are now known to have substantial concentrations of carvings, whereas previously recorded clusters in places like Inverclyde and the Outer Hebrides have been identified as mainly natural features or later marks mistakenly recorded as prehistoric cupmarks.



RIGHT: **The approximate rate of rock art discovery over the past 200 years since the first published discovery in 1830 to the completion of ScRAP in December 2021**

HOW WERE THE CARVINGS MADE?

The carvings were made by repeatedly striking the rock with a stone tool, such as a river-washed pebble, to chip away the surface material into the desired shape. This process is known as 'pecking', and we can often still see individual peck marks where the stone tool has impacted on the rock surface. Excavations at rock art sites in Scotland have recovered large quantities of quartz and quartzite pebbles that were probably used to make the carvings. You can read more about this in **Digging Deeper**. The precision of carving evident in some motifs indicates that they were made by indirect percussion using a stone 'chisel' and 'hammer' rather than by direct pecking. Before carving, the motifs may have been roughed out by scratching the rock surface or marking it with charcoal. Some pecked motifs were also ground with an abrasive material such as sand, whilst many others have been smoothed over time by wind and rain.

Experimental carving by archaeologists shows that it can take about 30–90 minutes to produce a cup-and-ring motif on softer rocks like sandstone or schist. Pecking motifs into harder rocks such as granite and gneiss would have been more laborious. It would have taken considerable time and effort to cover a rock surface with complex carvings, although extensively carved panels may have been added to or modified over a lengthy period of time.

Peck marks, created by a hard object such as a stone tool striking the rock surface, are still clearly visible in many well-preserved carvings today ©Joana Valdez-Tullett

Archaeological excavation and experimental carving indicate that rock art was probably made by repeatedly striking ('pecking') the rock surface with a hard stone
Image from Forestry and Land Scotland's rock art learning resource *A Song in Stone* ©Forestry and Land Scotland by Alan Braby 2020

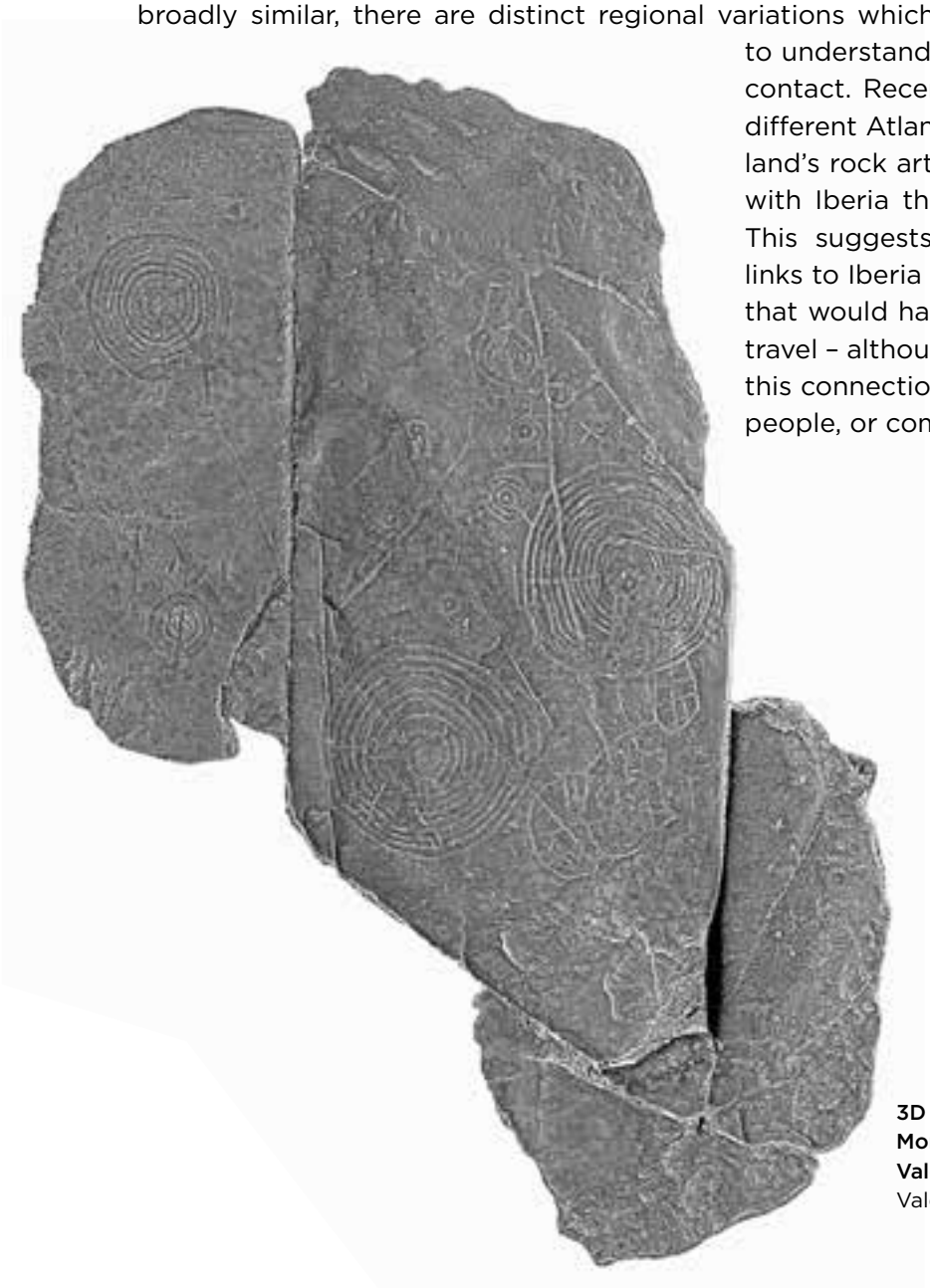
There is no clear evidence to indicate that the open-air carvings were painted, although pigment is unlikely to survive on exposed rock surfaces. Small fragments of a natural colouring material (red ochre) recovered from excavations of a carved rock at Hunterheugh in Northumberland may have been used to paint the motifs. Traces of red ochre and white clay have also been found on incised stones within Neolithic structures at Skara Brae, and red ochre decoration has been identified on stones at Ness of Brodgar in Orkney along with equipment for grinding pigments. Artificial colouring may not have been necessary because carving cuts through the dark, weathered surface of the rock to reveal its contrasting natural colour beneath. Freshly made carvings are visually striking but fade within a few years as they weather. Motifs were possibly re-carved at later intervals to make them visible again, and this process may have been considered as bringing them 'back to life'.

The motifs are much clearer when first made but weather to the same colour as the rock surface within a few years. They may have been re-carved or even painted with natural pigments such as ochre to make them stand out again
©John Holliday

A EUROPEAN TRADITION

Scotland's rock art belongs to a wider prehistoric carving tradition common to other parts of Britain, Ireland and western Europe, and often referred to as **Atlantic Rock Art**. Over 4,000 rocks with cup-and-ring motifs have been recorded so far in England, Wales, Isle of Man, Northern Ireland and the Republic of Ireland. The same types of abstract motifs are also carved on thousands of rocks in the open landscape in Iberia (north-west Spain and Portugal) and Scandinavian countries (Norway, Sweden and Denmark). In Iberia they are sometimes associated with images of deer, horses, weapons and humans, while in Scandinavia they are found alongside Bronze Age and Iron Age carvings of ships, weapons, warriors and animals.

The close resemblance between abstract motifs across Atlantic Europe suggests that they represent a network of shared knowledge, ideas, and customs that connected these Neolithic and Early Bronze Age communities. Although the character of the carvings is broadly similar, there are distinct regional variations which may be an important clue to understanding the nature of prehistoric contact. Recent analysis of carvings from different Atlantic regions shows that Scotland's rock art shares more characteristics with Iberia than with England or Ireland. This suggests that Scotland had strong links to Iberia in prehistory – a relationship that would have been made easier by sea travel – although it is not yet clear whether this connection was through movement of people, or commodities, or both.



3D model of Atlantic rock art at Monte dos Fortes I, Monte Faro, Valença, northern Portugal ©Joana Valdez-Tullett

PASSAGE TOMB ART

Another, slightly different form of prehistoric carving is also known in Britain, Ireland and western Europe (particularly north-west France and western Iberia). This is termed **Passage Tomb Art** or **Megalithic Art**. Passage Tomb Art is broadly similar to Atlantic Rock Art in terms of its date, technique and distribution, but includes motifs rarely found in the open landscape – spirals, wavy lines, lozenges, chevrons, zig-zags and more complex shapes – which can be arranged into elaborate designs on the rock surface. Unlike cup-and-ring carvings, these motifs are almost exclusively associated with Neolithic monuments, particularly chambered burial structures known as Passage Tombs. The carvings decorate internal walls and kerb stones surrounding the tombs. They form an integral part of the architecture and appear to have been created specifically for use in these monuments. Interestingly, many incised motifs from Neolithic buildings in Orkney resemble linear carvings from Passage Tombs and are similarly situated at key places within the structures.

The best examples of Passage Tomb Art come from burial monuments in the Boyne Valley, Ireland, and the Gulf de Morbihan in Brittany, France, while in Scotland they are mainly restricted to Orkney. Cup-and-ring motifs are sometimes found within Neolithic burial structures, but Passage Tomb Art motifs are very rarely used in the landscape. The few exceptions include a horned spiral at Achnabreck in Kilmartin and a 'solar' images at Ballochmyle, Ayrshire. Passage Tomb Art and Atlantic Rock Art may have had different meanings and served different purposes – one connected to death and burial, the other to the landscape of the living – but the relationship between them is unclear.

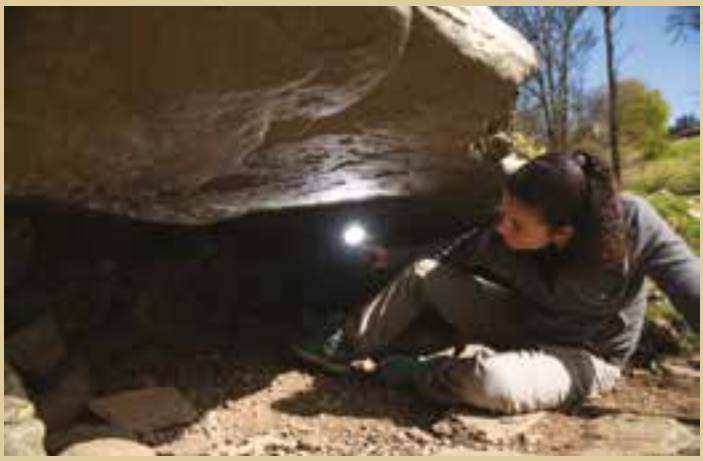
ABOVE: **The best examples of Passage Tomb Art in Scotland come from Orkney, including stones from the Neolithic chambered cairns at Pierowall Quarry, Westray** (top image: SC01863062©Orkney Arts, Museums and Heritage) **and Eday Manse** (bottom image: SC01863064©Courtesy of HES/RMS)

LEFT: **The horned spiral at Achnabreck, Kilmartin, Argyll, is a rare example of a Passage Tomb Art motif being used in an open-air landscape context** ScRAP©HES

FIGURATIVE ROCK ART IN SCOTLAND

Although the vast majority of Scotland's rock art is abstract, there are a few important exceptions where carvings show recognisable objects. These 'figurative' images are found almost exclusively in a handful of Early Bronze Age burials in Kilmartin Glen in Argyll, western Scotland. Until recently, the images were all thought to depict metal weapons, especially a type of flat axe-head that closely resembles real bronze axes dating to the Early Bronze Age around 2200–1900 BC. They appear to have been carved specially for deposition in the funerary monuments and, like other carvings in Early Bronze Age burials, they are positioned on stone slabs lining the burial chamber ('cist'), facing inwards towards the deceased. They would have been visible before and during the funerary ceremony, but hidden from view once the monument was sealed. We can only speculate on whether the carvings were intended as symbolic grave goods to protect or accompany the dead in the afterlife, or whether they denoted the status and wealth of the individual in the burial.

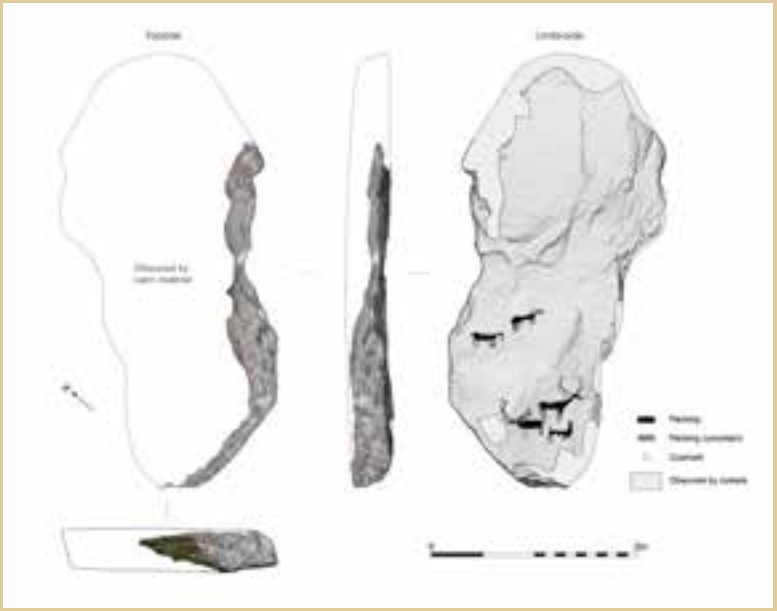
The Nether Largie North cairn in Kilmartin features two axe-head carvings on a side slab, and a further ten on the large capstone. The axe-heads on the capstone are superimposed over a cluster of cupmarks, which were made at an earlier date. Ri Cruin cairn in Kilmartin also has well-defined images of at least six flat axe-heads which appear to be carved over cupmarks. This burial monument contains another, more unusual carving that has been interpreted as a halberd – a type of pointed metal weapon used in the Bronze Age. Although images of metal weapons are rare



Prehistoric animal carvings have been discovered on the underside of the capstone forming part of a cist in the Early Bronze Age burial cairn at Dunchraigaig, Kilmartin, Argyll ©HES

in Britain and Ireland – the best known examples are carved on the Stonehenge trilithons – axe-heads and halberds, as well as daggers and other metal objects, are represented in European rock art during the Copper Age and Bronze Age. In north-west Iberia, images of metal weapons, as well as representations of animals and humans, are carved alongside cup-and-ring markings.

In May 2021, the sensational discovery of the earliest animal carvings in Scotland hit the headlines. Images of at least five animals, including two red deer stags with fine, branching antlers, were identified on the underside of a large cist slab in Dunchraigaig cairn, Kilmartin. The cist and cairn were excavated in the 1860s and have remained open ever since, but no-one had spotted the animal carvings until an enthusiast crawled into the tomb with a torch and a camera. 3D models clearly showed the shapes of the animals, and revealed faint anatomical details that were almost impossible to see with the naked eye. The final construction phase of the monument appears to have been between 2160 and 2080 BC based on dates for two Irish-type Food Vessels – a distinctive class of decorated pottery – found in the cairn



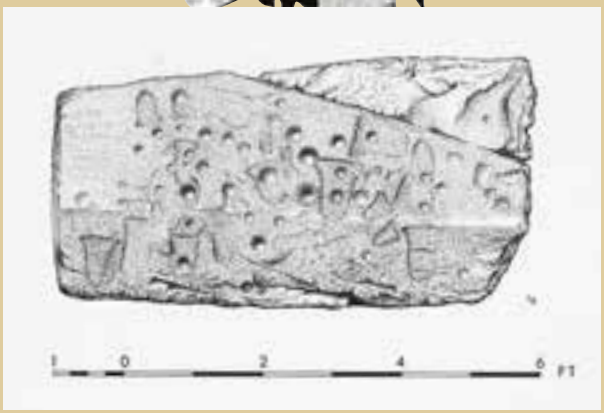
Drawing by Guillaume Robin showing five animals carved on the capstone, including two stags with large antlers and two possible juvenile deer ©Guillaume Robin

ABOVE LEFT: **The Dunchraigaig animal carvings are difficult to see but the antlers, head and body of the larger stag show up clearly with artificial lighting** ©HES

ABOVE RIGHT: **3D modelling and visual enhancement of the capstone revealed 'hidden' anatomical details and enabled identification of five animal carvings** ©HES

during the 19th century excavations. It is likely that the animals were carved earlier than this because they are weathered as if they had been exposed for some time before being built into the monument.

Representations of deer and other animals are fairly common in European Neolithic and Bronze Age rock art, but rare in the UK. The oldest animal carvings, from a cave at Creswell Crags in Derbyshire, date to the late Upper Palaeolithic, around 12,000 BC. The few deer images known from Neolithic and Early Bronze Age contexts in the UK are very sketchy and lack the detail of the Dunchraigaig animals. It is possible that inspiration for the Dunchraigaig deer came from Iberia where there are stylistically similar deer carvings in the south of the region, and animal carvings associated with cup-and-ring markings in the north-west.



ABOVE: **Representations of Early Bronze Age axe heads on the capstone of the burial cist in Nether Largie North cairn, Kilmartin, Argyll. The axe heads are carved over a series of cupmarks** SC1906317©HES

BELOW: **The large cist with the animal carvings lies on the south-eastern edge of Dunchraigaig cairn. It was empty except for the remains of 8 to 10 individuals. The cairn covers two other cists containing Early Bronze Age grave goods and human remains** ©Joana Valdez-Tullett

SINGLE GRAVE ART

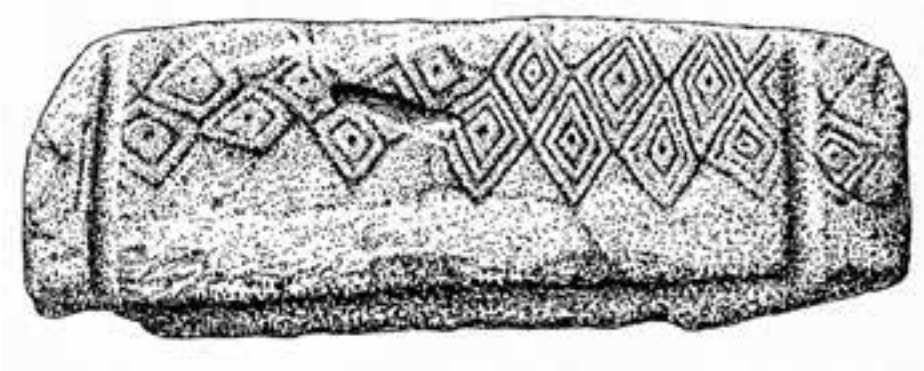
Single Grave Art refers to rock art incorporated into Early Bronze Age funerary monuments in Britain. These monuments differ from the earlier collective Neolithic tombs as they generally contain individual burials within a stone-built chamber (or 'cist') beneath a cairn of cobbles or turf. The carvings are usually located on the capstone covering the cist, facing inwards towards the deceased. Some of these stones are damaged as if they had been quarried from carved rock surfaces in the open air and re-used within the burial. More rarely, the carvings appear to have been modified or new motifs added before the stone was finally placed within the burial.

Most Single Grave Art comprises cupmarks, cup-and-ring markings and grooves typical of Atlantic Rock Art, but a few burials include more unusual, mainly linear, motifs. Interestingly, these tend to be selectively drawn from designs used in Passage Tomb Art and on Neolithic Grooved Ware pottery. For instance, lozenges and triangles on a carved stone discovered during recent excavation of the Drumnadrochit Bronze Age cemetery at Glen Urquhart in the Scottish Highlands are very similar to motifs carved in Neolithic burial monuments several hundred years before. Early Bronze Age metal and stone 'prestige' objects, such as jewellery, are also decorated with these angular designs. This recycling of earlier motifs may reflect continuity or adoption of specific elements of Neolithic symbolism and meaning, and could indicate a desire to be associated with the ancestral past.

Cist cover with circular and linear motifs from an Early Bronze Age burial at Baldardo, Angus, now in Meffan Museum ScRAP©HES

Slab with unusual carvings and evidence of re-carving, thought to have come from a burial cist and now in Kirkdale House, Dumfries and Galloway ScRAP©HES

Cist cover with damaged motifs from a probable Early Bronze Age burial at Craigie Hill, Lothian. ©Courtesy of HES (Reproduced with kind permission from Society of Antiquaries of Scotland). See image credits



Concentric interlocking lozenge motifs carved on a cist side-slab from a probable Bronze Age burial at Badden. The vertical grooves designed to accommodate the cist end-slabs suggest this stone was re-used from an earlier context SC370242©Crown Copyright: HES

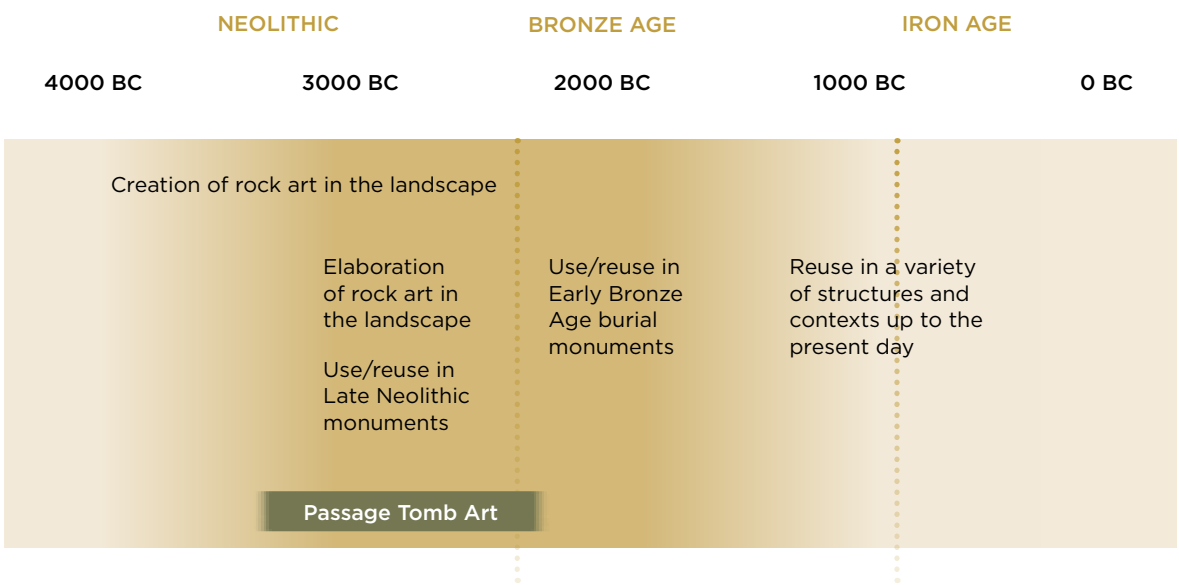
HOW OLD IS IT?

Precise dating of rock art is problematic. There are currently no scientific techniques for dating carvings on natural boulders or outcrops in the open air, and the abstract motifs common to Scotland and other parts of Atlantic Europe provide few clues about when they were made.

It was originally thought that Atlantic cup-and-ring carvings were created during the Bronze Age because carved stones were sometimes found in burial monuments of that period. This idea was reinforced by evidence from countries like Portugal and Spain where cup-and-ring motifs are found carved alongside images of metal daggers and other weapons similar in style to actual Bronze Age objects. This view has been revised in recent decades through new discoveries, archaeological excavations, and better dating of monuments.

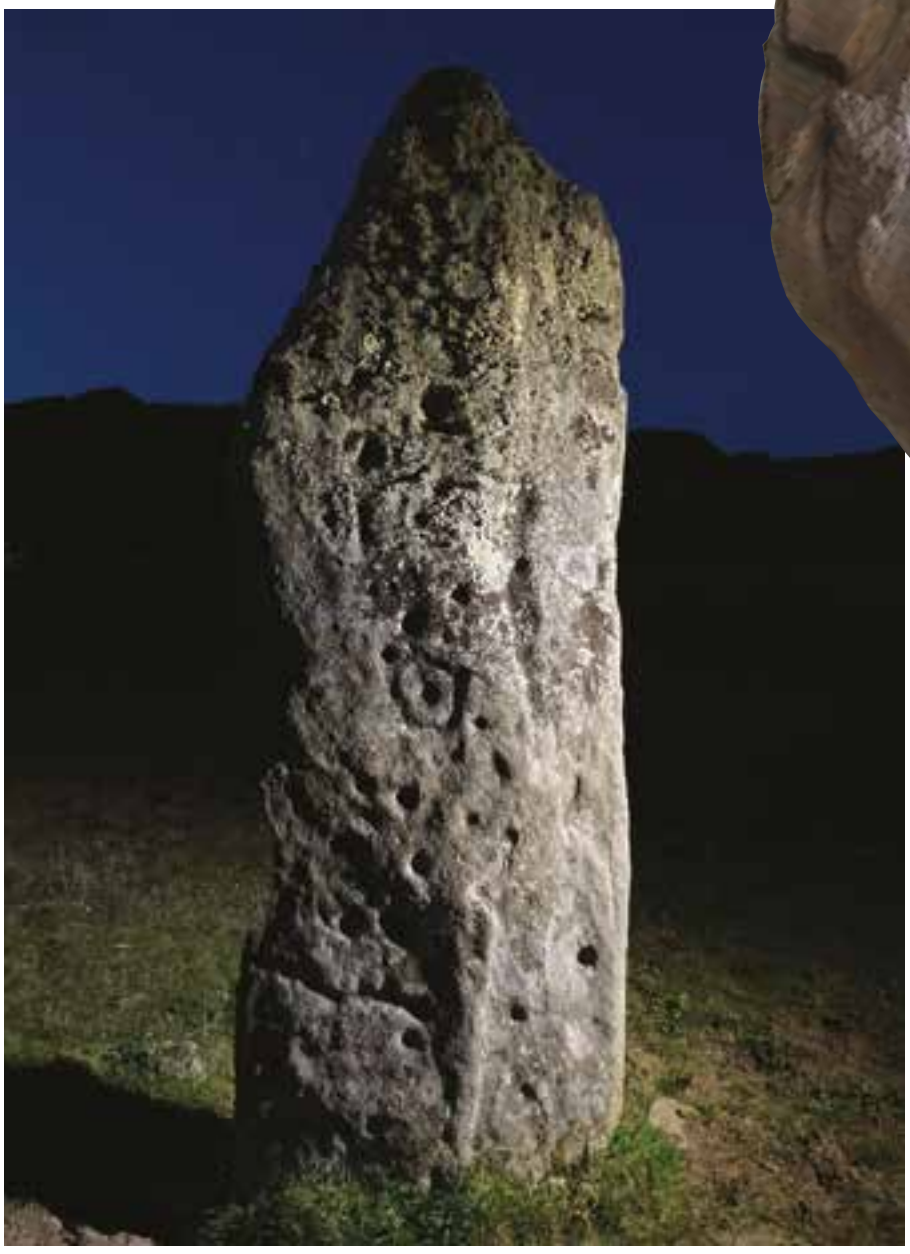
Rock art in Scotland, as elsewhere in Britain and Ireland, is sometimes found in prehistoric structures with a known date, which tells us that the carvings were created before or at the same time as the construction of the monuments. In the 1970s, the discovery of a cupmarked stone sealed within the Dalladies long cairn in Aberdeenshire, dating to around 3200 BC, provided the first Neolithic date for Scotland's rock art. Further discoveries within Neolithic and Early Bronze Age burial monuments, along with radiocarbon dates from excavated deposits associated with a carved outcrop at Torbhlaren near Kilmartin, Argyll, have established that Scotland's rock art was created in the Neolithic and Early Bronze Age (roughly 4000–1800 BC), but appears to have been significant throughout the Bronze Age and at times more recently. Continuation or revival of rock art use in later periods is supported by evidence from monuments such as Ballymeanoch in Kilmartin, where several carved stones, probably quarried from outcrops, were incorporated into standing stone rows during the Middle Bronze Age between 1370 and 1050 BC.

CHRONOLOGY OF BRITISH ROCK ART



Some carved rocks may have been repeatedly re-carved or added to over a prolonged period. Digital 3D modelling and visualisation techniques enable us to see fine details in the carvings that are not visible to the naked eye. We can now identify sequences of carving on some panels, although it is not clear whether these activities took place within a few days, a few years, or over hundreds of years. You can find some examples of these in **Digital Documentation of Rock Art**.

There are still many questions, however. Was rock art made constantly throughout the Neolithic and Early Bronze Age, or were there bursts of activity? Was it created at different times in different regions? Did certain types of motifs, such as cupmarks, have long lifespans, whilst other more complex carvings were in use only for a short time? How did the meaning of the carvings change through time?



ABOVE: **This cup-marked stone was found within the Neolithic long cairn at Dalladies, Aberdeenshire during excavations. Its discovery provided the first firm Neolithic date for rock art in Scotland** By kind permission of National Museums Scotland

LEFT: **The Ballymeanoch stone rows in Kilmartin, Argyll, include three standing stones decorated with rock art. The stones are thought to have been deliberately quarried from carved outcrops and re-used in the construction of this monument during the Middle Bronze Age** ©Joana Valdez-Tullett

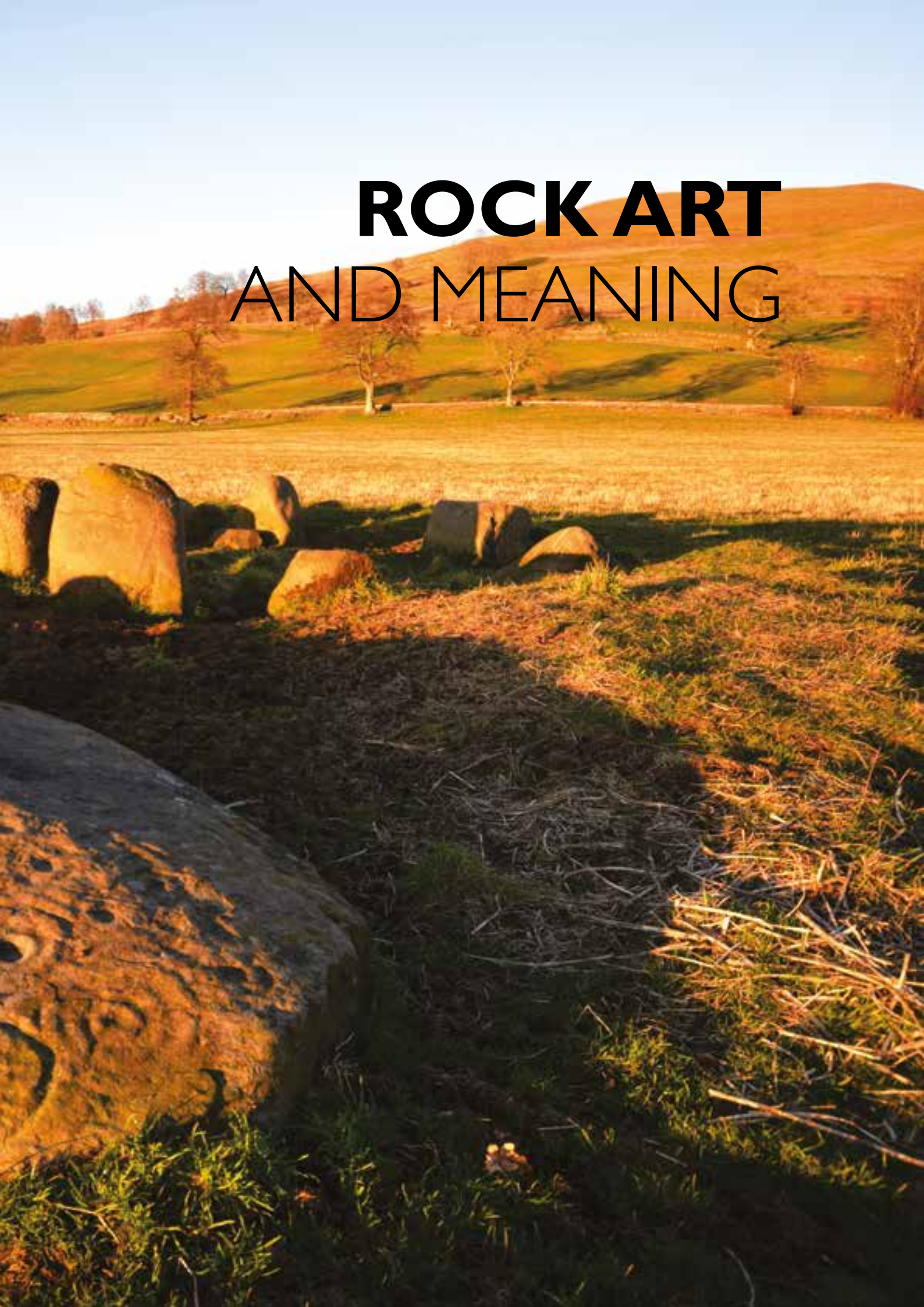
WHO MADE THE CARVINGS?

Scotland's rock art was created and used by early farming communities in the Neolithic and Early Bronze Age. It was probably made by people living in or visiting the area in which the carvings are found. We know from scientific analysis of artefacts and ancient human remains that people in the Neolithic and Bronze Age were travelling frequently and often covering considerable distances. Archaeological evidence indicates that communities at certain times in the Neolithic were relatively mobile as they depended more on domestic animals than arable crops. Mobility would have brought people into contact, providing opportunities for sharing knowledge, ideas, and commodities, and shaping their relationship with the landscape around them.

Beyond this, we do not know yet whether only certain people in the community could make the carvings, or whether anyone could make them but only on certain occasions. Experiments show that creating these types of motifs does not depend on physical strength – everyone can produce similar marks regardless of age, gender, or ability. It is also unclear whether the motifs on a particular rock or in a particular area were carved by one individual or many people. Complex carvings on larger rocks often show distinct differences in style, suggesting that they were created by several individuals, either working together or on separate occasions over an unspecified period of time. We know from studies of societies in other parts of the world that rock art is often produced by people with special ritual status. These individuals are generally esteemed as the keepers of powerful knowledge who create and use rock art on behalf of their community. It is possible that Scotland's rock art was created by 'ritual specialists', or by people with a particular social role or standing.

Sign at Big Balcraig, Dumfries and Galloway ©Tertia Barnett

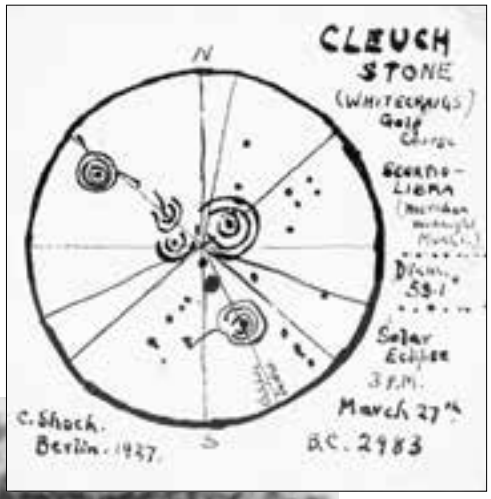
Monzie, Perthshire ©Douglas Scott



ROCK ART
AND MEANING

Scotland's rock art is a highly intriguing and enigmatic part of our heritage, and the quest to grasp its meaning has captured our imagination for centuries. Yet there are huge challenges to understanding rock art, especially abstract motifs, and we still know very little about its original purpose. Studies of traditional societies that produce rock art today provide valuable sources of information about why rock art was made. These studies suggests that prehistoric carvings in Scotland may never have had a single, fixed meaning. Meanings may have altered depending on how and when the carvings were made or used, and the age, gender or social identity of the person making or using them. Over time, many different people have encountered the motifs, and interpreted them according to their own cultural backgrounds and beliefs. This accounts for the abundant legends and folk stories that we know of today in which prehistoric carved stones are associated with fairies, witches, magic, and giants.

Despite the issues with understanding Scotland's rock art, there have been numerous suggestions about what it means – some more believable than others. The Scottish rock art specialist, Ronald Morris, listed 104 different theories that he ranked according to their credibility. More plausible ideas include maps of the landscape, charting or predicting astronomical events, and marking ritual places. Less likely suggestions range from water divining, moulds for casting metal objects, tallies of births, deaths or marriages, and grooves made by coiled snakes. Theories need to be supported by firm evidence, however, and it has not been possible yet to prove any of these ideas.



LEFT: **Cup-and-ring motifs and textured rock surface at Drumtroddan, Dumfries and Galloway** ©HES

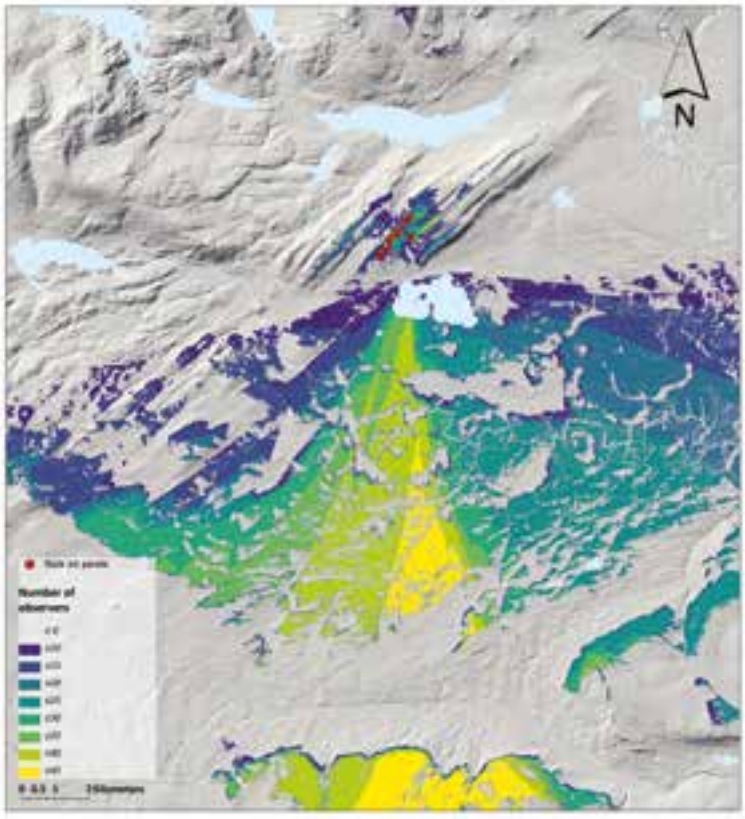
BELOW: **Rock art is often considered to be linked to significant astronomical events, such as mid-winter sunrise or major lunar standstills. Independent researcher Ludovic McLellan Mann, among others, made detailed studies of panels including the Cochno Stone, West Dunbartonshire and Cleuch Stone, Glasgow, to correlate motif arrangements with celestial movements and ancient myths** SC1062363©Courtesy of HES (Ludovic McLellan Mann Collection); SC1328559©Courtesy of HES (J Harrison Maxwell Collection)

PLACE AND SPACE

The landmark work of Professor Richard Bradley (University of Reading) in the 1990s stressed the importance of looking beyond the motifs, and understanding why carvings were located in specific places in the landscape. Rock surfaces were not carved at random. Particular rocks in specific locations were deliberately selected, and the reasons behind these decisions are encoded within the contexts of the rock art. Although we may never know what the symbols themselves meant to the people that created them, the nature of the rocks chosen for carving, and their position in the landscape can provide vital clues about the role of rock art in the prehistoric world. Studies using this approach, at the time, suggested that rock art marked routeways and defined significant places. There also seemed to be clear distinctions in the complexity of carvings in relation to certain natural and cultural features in the landscape.

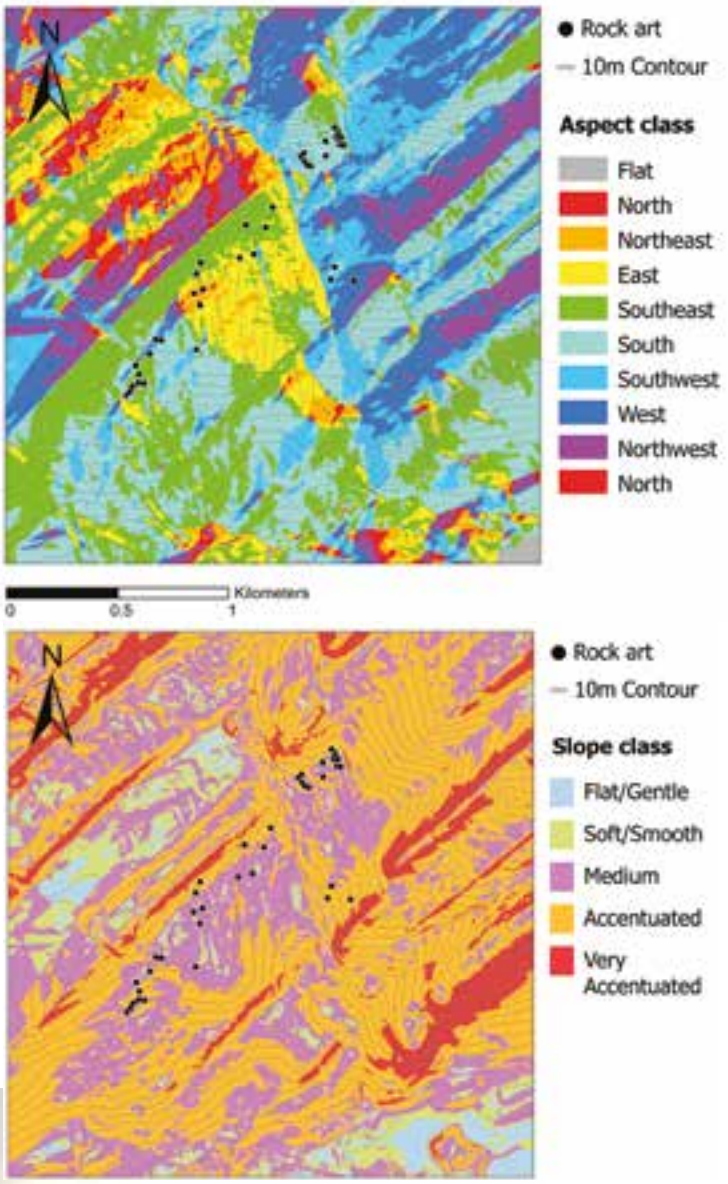
Landscape approaches have been stimulated in recent decades by developments in digital technology, especially Geographic Information Systems (GIS). GIS is a system used to create, manage and analyse spatial data. It helps us understand spatial patterning of rock art within the landscape, and how it relates to different natural and human-made elements. It can be used to explore features such as the degree of slope and orientation of carved rock surfaces, or the visibility and prominence of panels in relation to the surrounding terrain, or to simulate routeways and movement across the landscape.

Visibility has long been assumed to play a role in determining the choice of rock art location. GIS viewshed analysis calculates the area that can be seen from a specific place, taking into account the nature of the terrain. It often highlights prominent landmarks but, in the process, it can also emphasise other features that may have been considered important in the past. Combining viewsheds for rock art panels with the spatial locations of other types of archaeological sites, for example, can show whether they were intervisible, or how many panels can view the same spot simultaneously. It is also possible to generate reverse viewsheds to study the visual prominence of the rock art, and identify the places in the landscape from which a panel can be seen. Research during ScRAP created viewsheds for multiple individual panels, and combined these to



Cumulative viewshed from a cluster of rock art panels in the Port of Menteith area of Stirlingshire. The viewshed is clearly focussed to the south, whereas views to the north are very restricted (yellow shows the view from the most panels; purple shows the view from least panels, blank areas are not visible from any panel).
See image credits

produce 'cumulative viewsheds' for particular areas. Overall, even though some panels have extensive views, their direction of visibility is largely determined by the landscape. In the Port of Menteith area, for instance, the hilly terrain naturally channels the viewsheds across low-lying land to the south, while views towards the north are restricted by higher ridges. By comparing the direction and intensity of cumulative viewsheds with the location of different types of prehistoric sites, it has also been possible to identify whether the rock art intentionally focussed on specific archaeological features. You can read more about this and other findings from ScRAP's research in **Analysing Scotland's Rock Art**.



TOP RIGHT: **Map showing the aspect (or orientation) of the terrain in relation to rock art at Port of Menteith. In this case, the panels are situated mainly on east to south-facing slopes.** See image credits

BOTTOM RIGHT: **Map showing the relative steepness of the terrain in relation to rock art at Port of Menteith. In this case, the panels are situated mainly on medium to accentuated slopes.** See image credits

BELOW: **All panels at Port of Menteith have open views towards the south** ScRAP©HES

ANALYSING SCOTLAND'S ROCK ART

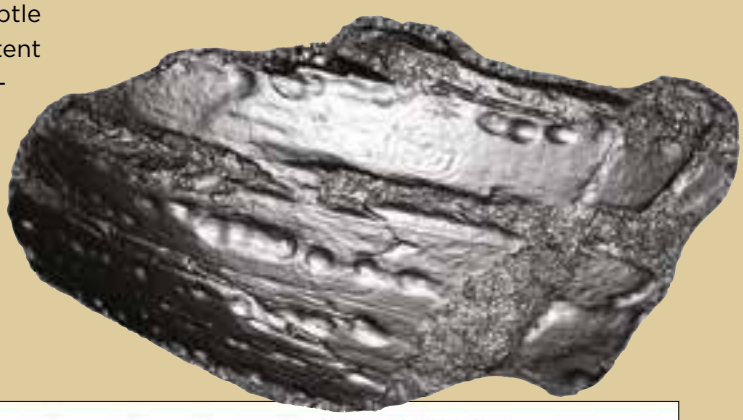
In recent years, developments in computer technology have unlocked new opportunities for revisting old questions about rock art. Scotland's Rock Art Project (ScRAP) used a range of spatial and statistical methods to analyse the large volume of detailed information co-produced with Community Teams. These techniques provided exciting insights into the character and regional variations of rock art across Scotland, and its connection to the wider Atlantic Rock Art tradition.

ScRAP's research involved a multiscalar approach that focused on the motifs, the type of rocks on which they were carved, and their landscape contexts. At each scale, the analysis investigated several variables that define the shapes of the motifs, how they were carved, and their interaction with the rock surface, as well as the relationship of the rock art to natural and cultural features in the landscape, such as vegetation, soils, geology, land use, different types of prehistoric monuments, and artefact find spots.

At the smallest scale of analysis, close study of over 1,000 3D models revealed numerous subtle variations of different motif types, and the extent of modification and superimposition of carvings. It also showed an intimate relationship between the carvings and the natural features of the rock surface. Cracks, fissures, undulations, solution hollows, and edges of the rocks were often enhanced, carved over or around, transformed into motifs, or integrated into the overall compositions.

Comparing the character of carvings from different parts of Scotland exposed regional similarities and variations, which may reflect connections between people and places in prehistory. For instance, areas such as Dumfries and Galloway, Mid-Argyll and Perthshire have a high frequency of complex carvings and share specific characteristics, and may have been more closely linked to each other than to northern regions like Highland Scotland where the motifs are mainly cupmarks. Essentially there seems to be a divide in rock art complexity between northern and southern Scotland, with a possible transition zone around Loch Tay in Perthshire, which may reflect distinctions in how past societies in different regions engaged with the carvings. There could be other explanations for this regional variability. For instance, the less elaborate nature of rock art in northern Scotland could indicate a shorter, or earlier, period of production and use than in southern regions.

The 3D model of Balmae 6, Dumfries and Galloway, reveals rings carved around natural hollows near the centre of the panel ScRAP©HES



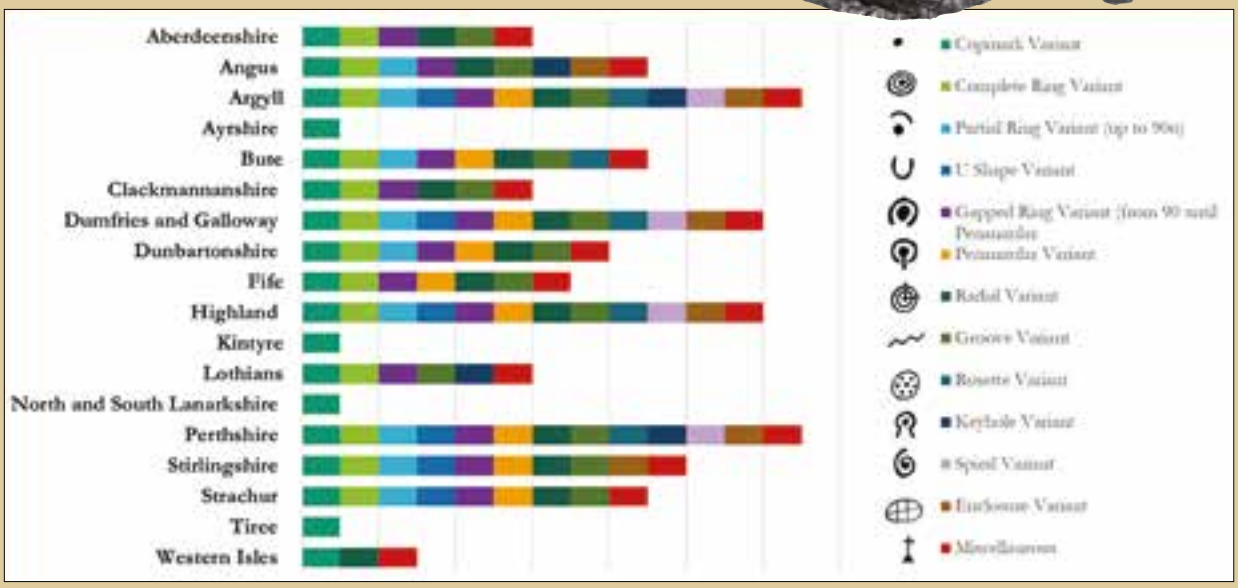
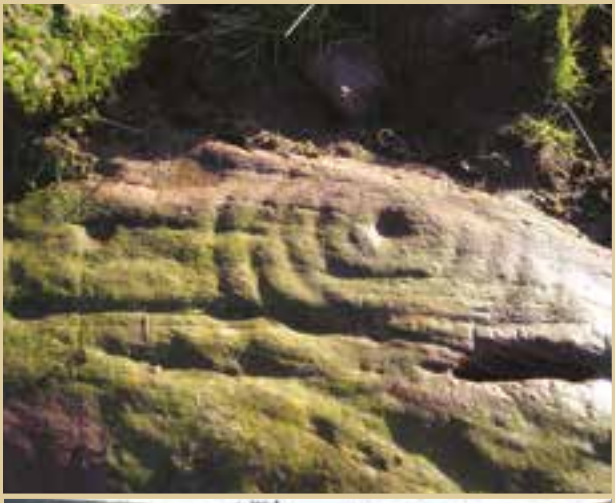


Chart showing the extent of regional variation in the types of motifs

At a larger scale, the analysis identified common trends in Scotland's rock art. For example, carvings are preferentially made on horizontal or gently sloping outcrops facing towards the south and, to a lesser extent, east and west, rather than northwards. These orientations would ensure the motifs were illuminated by the sun, even in winter months. It is possible that the types of vegetation favouring southerly rather than northerly facing slopes could have obscured or enhanced the visibility of the carvings at different times of year. As rock surfaces often follow the natural slope of the land, and southwards-facing hillsides are more attractive for human settlement and farming, the preference in orientation could also indicate a link between rock art and human domestic or subsistence activities.

Although rock art is often located in places with other prehistoric monuments, there is no clear spatial or visual relationship between them. While standing stones and burial monuments are usually situated in easily accessible places on natural routes through the terrain, rock



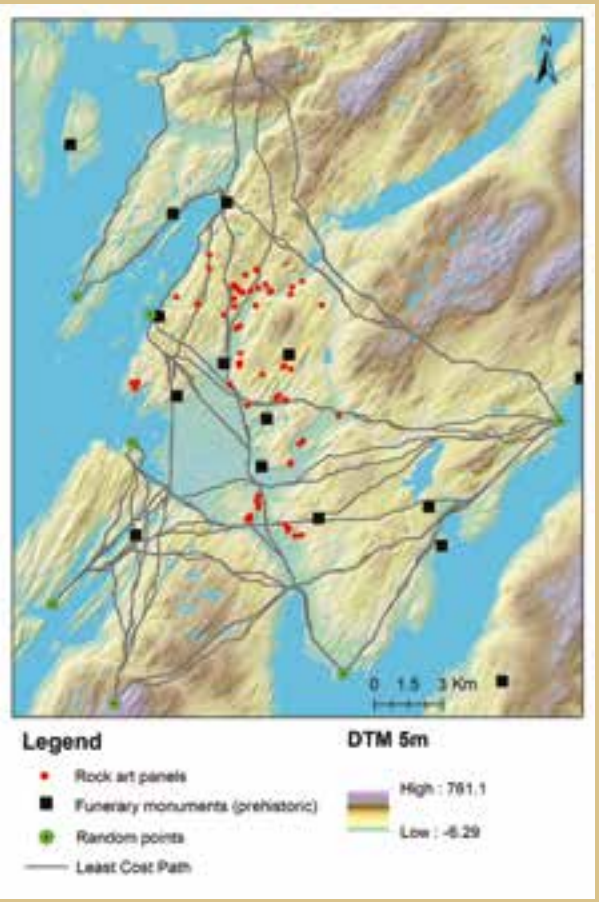
TOP LEFT: **Cup-and-ring motif intersecting with the rock surface edge and a fissure. Glen Tarf, Perthshire** ©George Currie

TOP RIGHT: **Motifs arranged with respect to natural fissures. Cairnbaan 4, Argyll** ScRAP©HES

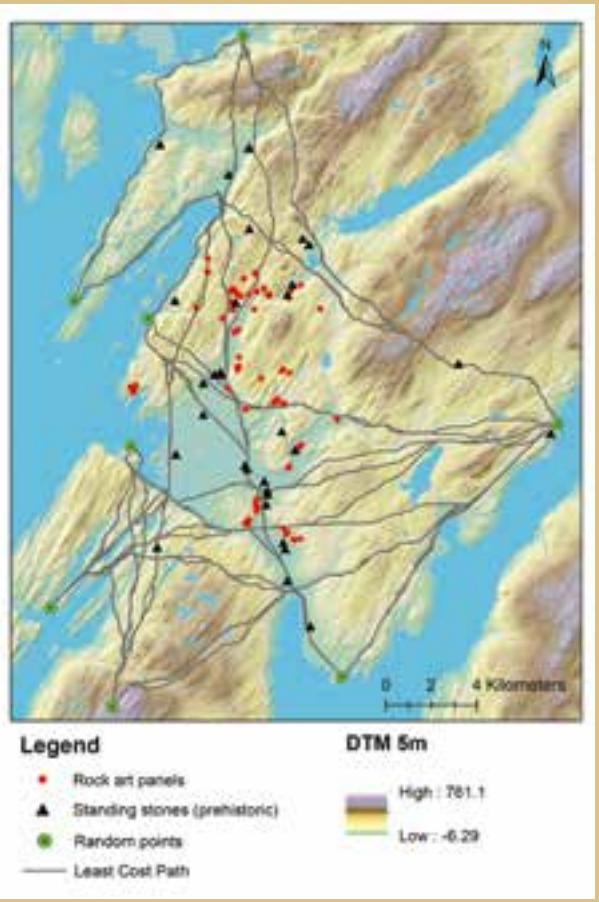
CENTRE LEFT: **Most panels are small, low-lying and often indistinct. Ardoch, Highland** ScRAP NOSAS Team ©HES

CENTRE RIGHT: **More rarely, panels form prominent features in the landscape. Cadruim 1, Tiree, with NOSAS** ScRAP©HES

RIGHT: **Carvings are most frequent on horizontal or gently sloping surfaces. Blarmafoldach 1, Highland** ScRAP©HES



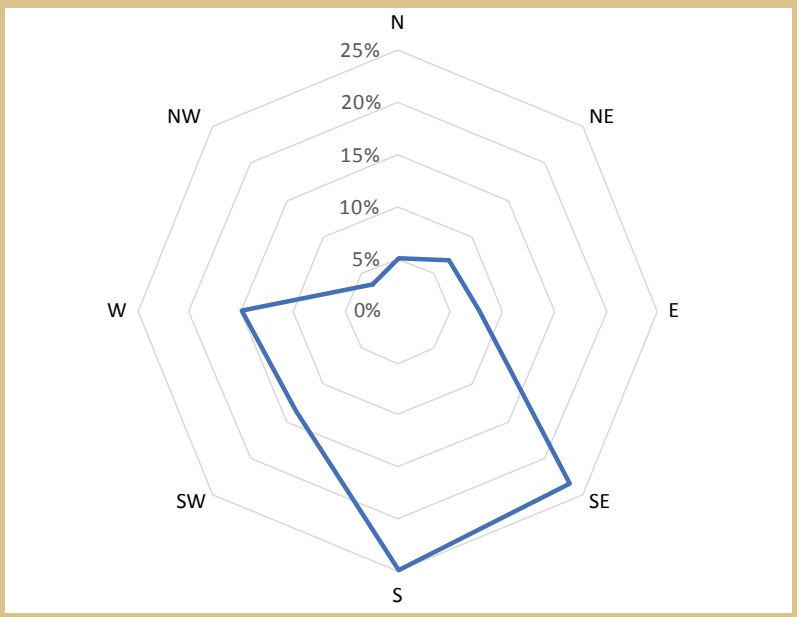
Computer-simulated routes through the landscape around Kilmartin showing the relationship between mobility, rock art and prehistoric burial monuments. See image credits



Computer-simulated routes through the landscape around Kilmartin showing the relationship between mobility, rock art and prehistoric standing stones. See image credits

art follows a different pattern. It lies away from the most obvious pathways and is often hidden from sight by the local topography unless approached from a particular direction. This, combined with the fact that panels are mainly low-lying and often relatively small, suggests that the carvings were intended to be relatively private or require special knowledge to view them. There are of course exceptions to these 'rules', and certain panels, like Tobhlaren in Argyll, form prominent features in the surrounding landscape. These panels may have served a different purpose, such as places for communal gatherings at certain times of year or on special occasions.

This research has gone a long way to improving our understanding of Scotland's rock art, while the large body of detailed, quantitative data compiled during ScRAP offers endless possibilities for future analysis, and opens up many new avenues for investigation.

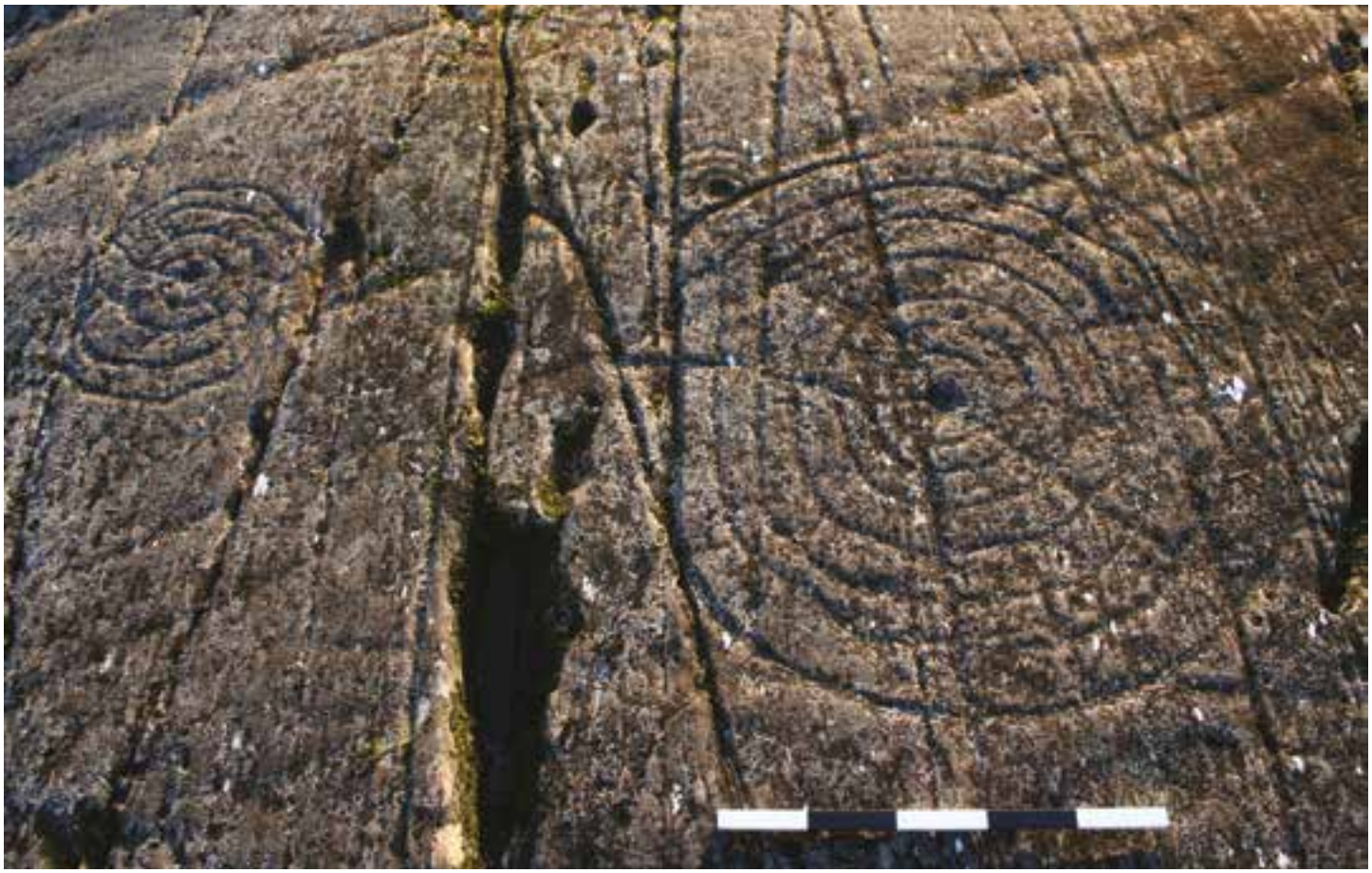


Rock art panels across Scotland are overwhelmingly situated on more southerly-facing slopes. The chart shows the percentage of 580 carved outcrops in relation to slope orientation

LIVING ROCKS

Other important academic research has considered the nature of the rock on which the carvings are made. The merging of natural and human-made features suggests that the rock itself was perceived as significant. Its significance was enhanced by carving particular motifs and frequently incorporating qualities of the rock surface into the composition. Many cultures today view certain rocks, or rocks in certain places, as living entities that possess supernatural powers. These 'living rocks' are often a focus for rituals and offerings to appease or harness their powers. Dust and fragments from such rocks are thought to have magical qualities that ensure fertility or protect against harm and evil if swallowed or smeared on a person's body – a practice that is still alive today in certain parts of the world, such as Chad in North Africa. In some instances, the rock surface is thought to be a permeable membrane between the human and supernatural worlds. Natural cracks and fissures allow access between these domains under specific circumstances. In prehistoric Scotland, people may have believed that all elements of the natural world, including human health and fertility, the weather, and the success of crops and livestock, were controlled by supernatural forces. The act of creating rock art possibly enabled people to tap into and negotiate with the spirit world. The need to call on other-worldly powers by carving or re-carving rock art may have been greatest at times of environmental or social stress.

Natural features such as crack and fissures are frequently incorporated into the motifs, suggesting that the rock itself was considered significant. The outer rings of this large cup-and-ring motif at Achnabeck, Argyll, disappear into or emerge out of a natural fissure ScRAP©HES

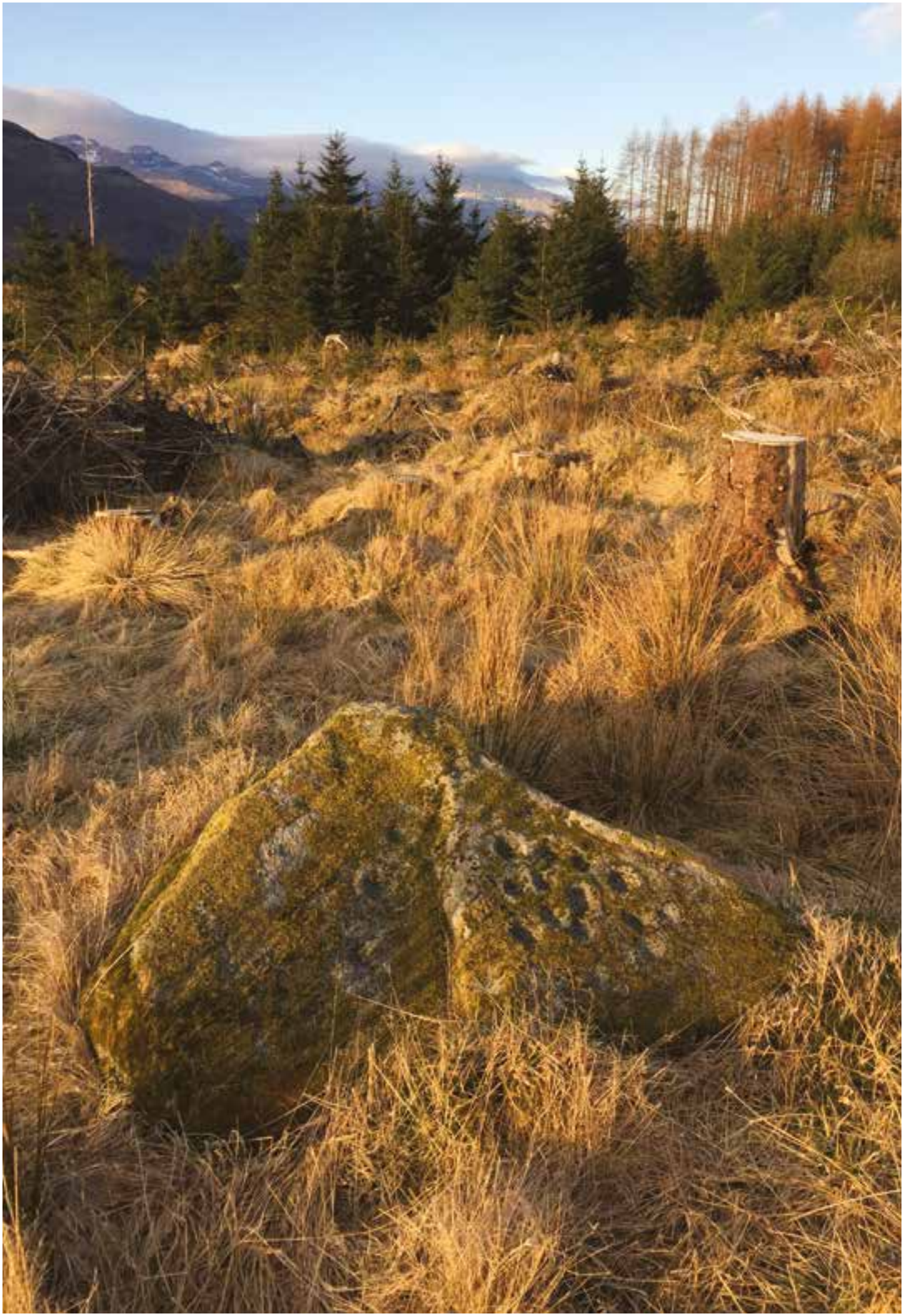


ROCK ART AS PERFORMANCE

We can also consider other dimensions of the carvings beyond their visual appearance and physical setting. How was the rock art experienced by the people that made and used it? One suggestion is that the production of rock art might have formed part of a communal performance that involved sound, light, and movement. Carving motifs is physically demanding and noisy. The rhythmic sound produced by pecking, the process of altering the rock, and the associated social interactions may have generated powerful sensory and emotive experiences that strongly affected what rock art meant to people in the past. Based on parallels from societies in other parts of the world, some researchers suggest that circular motifs may have been inspired by 'entoptic' phenomena. These are a type of optical experience produced by the retina through eye stimulation or during altered states of consciousness. Altered states of consciousness can be caused by repetitive, rhythmic sound or movement, consumption of psychotropic substances, sensory deprivation, or extreme physical exertion. The experiences and activities linked to rock art production were possibly as important to people as the motifs themselves, and may have become deeply rooted in individual and collective memories within the community. Through such experiences and memories, rock art had the power to influence human thinking and behaviour.

ABOVE: **Flickering light animates the motifs. The performance of natural and artificial light on the rock surface may have been an important part of how rock art was experienced in the past** ©Northumberland and Durham Rock Art Project

OPPOSITE: **Mid Lix, Perthshire** DP231218©G F Geddes



DIGGING DEEPER

Recent excavations in Britain, Ireland and Scandinavian countries have provided a fascinating insight into prehistoric activities around rock art panels. In particular, two excavations in Scotland, at Torbhlaren in Argyll and Ben Lawers in Perthshire, have substantially altered our perspectives on rock art.

TORBHLAREN

The Kilmartin area of Argyll is renowned for its prehistoric ceremonial landscape. This contains a wealth of Neolithic and Early Bronze Age monuments as well as around 300 rock art panels, including the immense carved outcrop at Achnabrek and elaborately decorated surfaces at Cairnbaan.

Between 2004 and 2007, a team led by Professor Andrew Meirion Jones from Stockholm University excavated the surroundings of two large carved outcrops (nicknamed Lion Rock and Tiger Rock) at Torbhlaren, in Kilmichael Glassary, a valley to the east of Kilmartin Glen. The excavations revealed activity at the site over thousands of years, between about 7000 BC and AD 1200. Tiger Rock was a focus of repeated attention, particularly in the Neolithic. Initially, a small, circular structure of wooden posts was built against the edge of the outcrop. The structure burnt down, possibly deliberately, in the Late Neolithic around 2580–2340 BC. Very soon afterwards, a low, circular stone retaining wall and cobbled platform set in clay were constructed on the same spot. The platform was covered in vast quantities of quartz and quartzite fragments and river pebbles, some with worn edges. Experimental archaeology showed these

Fragments of quartz and quartzite from excavations on and around the carved rocks at Torbhlaren, Argyll
©Aaron Watson

pebbles were probably hammerstones used to make the carvings. The volume of quartz recovered from the excavation indicate the importance of this material in how the site was used. Quartz is white, like the moon, and has special properties that make it glow and spark when struck and, when shattered, it produces a fine dust that glitters in the light. Some cultures today believe quartz has magical powers that protect against evil spirits, and similar beliefs may have existed in Neolithic Scotland. At Torbhlaren, quartz fragments and hammerstones were wedged into large natural cracks and fissures on both outcrops, as if intended as an offering or a connection to the supernatural domain 'within' the rock. A radiocarbon date of 2920–2860 BC from organic material sealed inside a fissure containing hammerstones may provide evidence for Late Neolithic rock art production, although there is no direct proof that these stones were used to make the carvings. Material from other fissures produced Late Bronze Age dates of around 1320–1110 BC, suggesting that the rock art might have been used for much longer than originally thought.

Excavations at Torbhlaren, Argyll
©Aaron Watson

BEN LAWERS

Excavations around four carved rocks at Ben Lawers, Perthshire, by Professor Richard Bradley and his team in 2009 revealed similar patterns of activity to Torbhlaren. These included large accumulations of worked and unworked quartz, lithic artefacts deposited within natural fissures and hollows on the carved surfaces, and a cobbled platform constructed adjacent to an elaborately decorated panel. Interestingly, as at Tobhlaren, the platform was positioned to give the best possible view of the carvings. Although there were no radiocarbon dates from the excavated material, the discovery of two blades of Arran pitchstone – a rare black volcanic rock from the Island of Arran, often found in Scottish Neolithic deposits – indicates a probable Mid–Late Neolithic date for activities associated with the rock art.

Excavations of rock art sites in England, Ireland and Denmark have produced similar dates and patterns of activity, suggesting a widely shared ritual tradition. Stone-built platforms covered in quartz are also a feature of late 3rd millennium BC monuments in Scotland, such as the Clava Cairns in Inverness-shire which contain several carved stones, and around carved Neolithic Passage Tombs in Ireland, emphasising the association between quartz and rock art.

3D model of elaborate and eroded carvings on Lion Rock, Torbhlaren, Argyll ScRAP Kilmartin Field School ©HES

Although the dates from the Torbhlaren and Ben Lawers excavations do not tell us precisely when the rock art was made, they indicate that it was probably created during the Neolithic and continued to be significant for hundreds of years. Importantly, these studies provide crucial evidence for activities taking place on and around the carved rocks, emphasising the attention paid to natural features and materials, and the powerful experiences associated with creating rock art. By focusing away from the static, visual appearance of the motifs, they enable us to consider the dynamic role of rock art creation and use in shaping social interactions and perceptions in the past.

Excavation around Cloanlawers 6, Perthshire ©Aaron Watson

ROCK ART TODAY

WHY RECORD ROCK ART?

Detailed, accurate records are essential for understanding, protecting and caring for rock art. Without reliable information, rock art risks becoming damaged or destroyed, and research is compromised. Records for prehistoric rock art in Scotland have been compiled over two centuries by many different people using varied techniques and, as a result, they are inconsistent and sometimes inaccurate. A key aim of the Scotland's Rock Art Project was to work with trained Community Teams to gather standardised, comprehensive information about the carvings and their contexts. This information has been made publicly accessible for future study, awareness, and management, and was used for rock art analysis during the project.

LEFT: **The enhanced 3D model of Braes of Balloch 1, Perthshire created by ScRAP in 2020** (left ScRAP©HES) **provides an accurate, detailed view of the motifs compared to an earlier 2004 drawing of the same panel from Canmore** (right ©Crown Copyright: HES)

BELOW: **Members of the ScRAP Team and Callander Team measuring a large cup-and-ring motif** ©HES

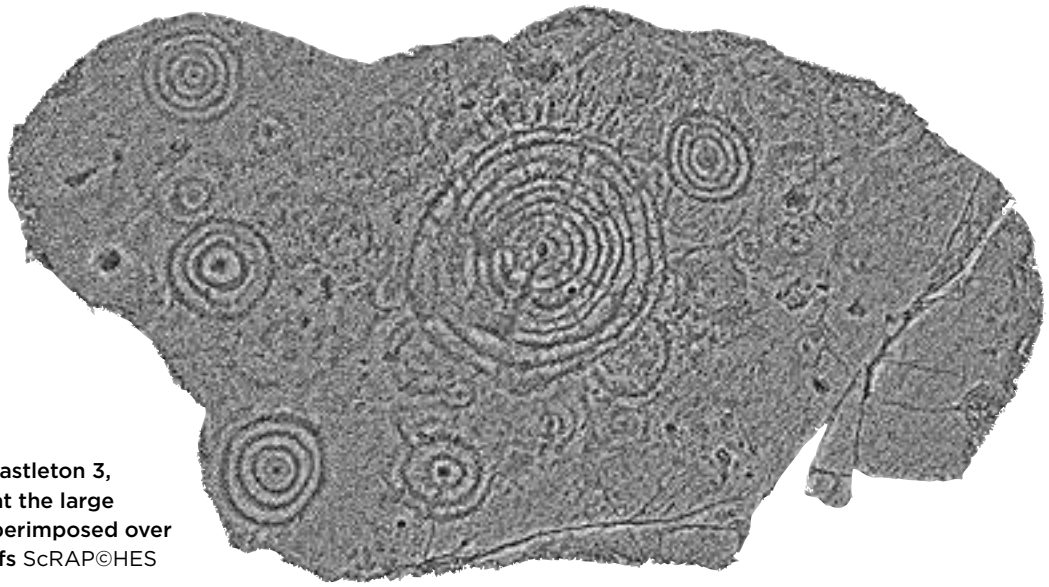
WHAT DO WE RECORD?

The way we record rock art has changed dramatically in the last few decades as attitudes and technology have evolved. Traditional documentation methods focused on capturing the motifs and their arrangement on the rock surface using techniques such as drawing, rubbing, tracing, or even taking casts to make replicas. These approaches are not ideal as their accuracy varies, and they miss important information about the condition of the carvings, the natural character of the rock, and the wider setting. They can also damage the carved surface, particularly if repeated several times on the same panel.

Rather than studying the motifs in isolation, investigators and heritage managers are now interested in a more holistic view that includes the relationship of the carvings to the rock surface, and to natural and archaeological features within the landscape. As the data have a range of uses – research, education, management, and public interest – it is important to capture as much information as possible to satisfy the different questions that may be asked now and in the future.

There are three crucial rules for rock art recording. First, it should be entirely non-destructive. Rock art is very fragile and any impact on it contributes to its deterioration. Second, the same recording methods should be used for every panel, ensuring that the data are consistent and can be compared. Third, it should be objective and repeatable – this means that everyone should be able to get the same results.

There is currently no single technique for recording rock art, so a combination of methods is generally used. The 'tool-kit' will vary depending on things like the type of rock art and its context. For example, open-air carvings are recorded using different methods from painted rock art within caves. Digital technology has revolutionised rock art recording by providing tools that quickly and accurately capture detailed information about both the motifs and the rocks on which they were carved. As this technology becomes increasingly accessible, there are growing opportunities for all sectors of the community to create rock art records. This is an exciting, rapidly evolving field, and new approaches will continue driving forward rock art recording and research well into the future.



Enhanced 3D model of Castleton 3, Stirlingshire, showing that the large cup-and-ring motif is superimposed over at least two smaller motifs ScRAP©HES

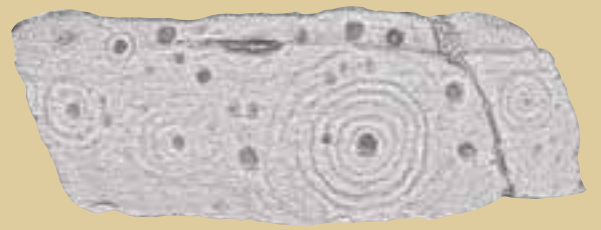
DIGITAL DOCUMENTATION OF ROCK ART

In the last twenty years, digital technology has revolutionised how we record and interrogate archaeological sites. Laser scanning, structured light scanning, and image-based modelling techniques (often known as photogrammetry) are now widely used in archaeology for 3D recording and visualisation of monuments and artefacts. These techniques are particularly well-suited for recording rock art because, unlike traditional recording methods, they do not impact on the rock surface, and they capture a precise replica of the three-dimensional shape of the rock, its texture, and its natural features. They also enable us to see faint carvings and subtle details in the motifs that may not be visible with the naked eye. Because 3D models are precise reproductions, they are measurable and provide benchmark data for conservation monitoring and research. For example, comparing the depth of carvings from two 3D models of the same rock, created several years apart, enables us to measure the rate at which the motifs are eroding.

Enhanced 3D model of The Binn 1, Fife, reveals subtle details of the production and modification of the cup-and-ring motif ScRAP©HES

Laser scanning and structured light scanning currently require specialist equipment and skills, so are generally more expensive and restricted in their use. Historic Environment Scotland's Digital Documentation and Innovation Team created high-resolution 3D models of several rock art panels as part of their wider project to digitally record all Properties in Care in Scotland. You can view these on Historic Environment Scotland's Sketchfab account, listed at the end of this booklet.

Image-based 3D modelling is an excellent technique for large-scale community-led recording as it does not require expensive equipment or advanced training, and is relatively quick to use in the field. Scotland's Rock Art Project (ScRAP)



Altering the surface texture on 3D models helps us to visualise different features of the carvings and rock surface, as illustrated by this 3D model of Blarnaboard 1, Stirlingshire, and the photograph of the panel (bottom) for comparison ScRAP Callander Team ©HES

Structure from Motion photogrammetry is a quick and straightforward way to capture 3D rock art data in the field ©Tertia Barnett

used an image-based modelling technique called Structure from Motion (SfM) photogrammetry, commonly applied in archaeology. This technique can be effective at a range of scales, and is cost-effective, versatile and user-friendly – all you need is a camera and a scale bar. It simply involves taking a series of overlapping photographs of the carved rock from different angles as you move around it. Each photograph captures multiple features, or points, that are recognised by a dedicated software. As long as each photograph overlaps with neighbouring photographs by at least 30%, the software will identify and match-up points to create a digital 3D model. ScRAP used Agisoft Metashape to process the 3D models, although various alternative open-source softwares are available.

The 3D model can then be visualised in different ways by digitally altering the light conditions and surface textures so the carvings appear more distinct. There are various softwares that can be used to enhance 3D models, such as the opensource Meshlab used by ScRAP. The benefit of 3D models is that they can be produced and shared easily. Online platforms such as Sketchfab empower digital creativity by making it easy to publish and interact with 3D models. Manipulating the model and viewing it from different angles also alters our perspective and reveals things that may not be evident from a single, static viewpoint.

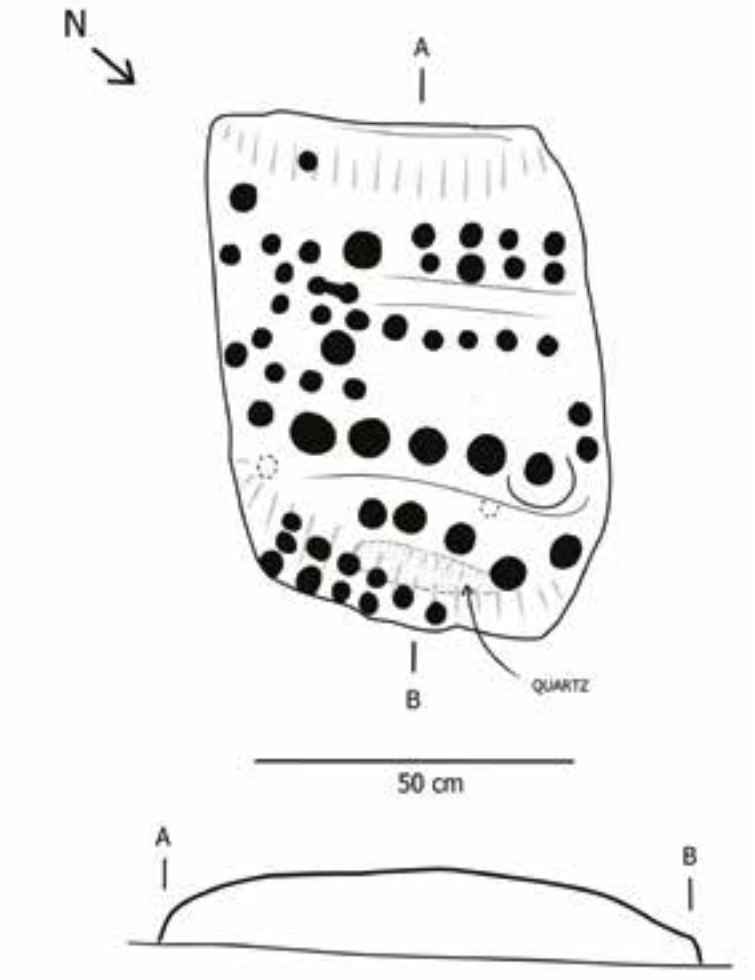
Visual enhancement of 3D models created during ScRAP not only highlighted subtle variations of the motifs, but also revealed unprecedented evidence of their reworking and superimposition. This changes our understanding as it shows that carved rocks were repeatedly modified, rather than created in a single event.

Weathering and lichen can make rock art almost invisible, but the motifs show up clearly in a 3D model, as is the case for these unusual spirals and ring at Crosswood 1, West Lothian ScRAP©HES

HOW DO WE RECORD ROCK ART?

The recording approaches used by Scotland's Rock Art Project built on methods developed through similar initiatives in England (Northumberland and Durham Rock Art Project, and Carved Stones Investigations: Rombalds Moor). In common with these projects, ScRAP trained and worked closely with members of the community. Working with communities had enormous benefits by enabling coverage of a huge area of Scotland, introducing new ideas and perspectives, enriching the record with local knowledge, and widening awareness and appreciation of rock art.

The ScRAP Team trained over 180 individuals who then formed 12 Community Teams. Collectively, our task was to use a standardised methodology to create detailed, accurate, and consistent records for every panel we located. In total, we co-recorded over 1,600 panels across Scotland, including 250 new discoveries. Because we used a standardised approach, the records can be compared and analysed at different scales, and provide comprehensive information for management, education and public interest. The ScRAP records are also compatible with those gathered through community co-production projects in England, and together form a world-leading dataset containing over 4,000 rock art records from across Britain.



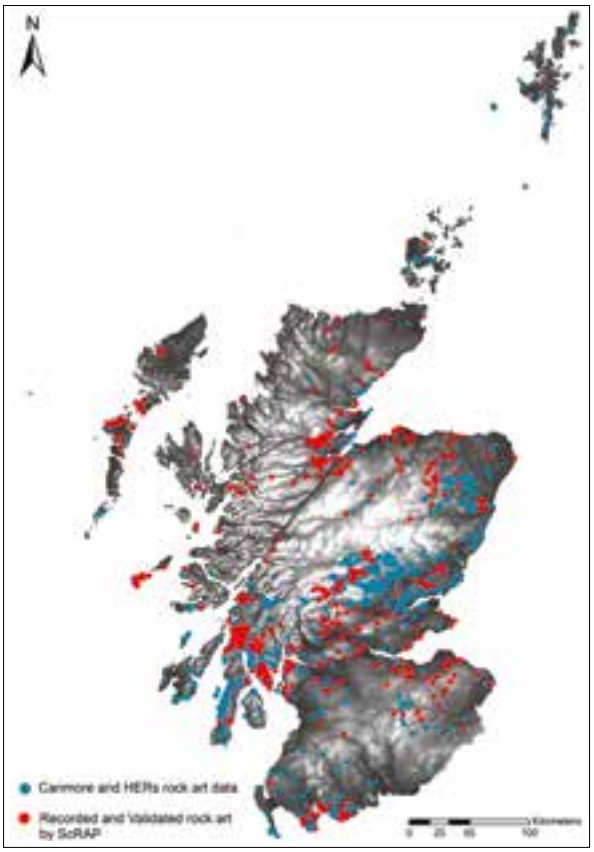
Digitised field sketch of the panel surface and profile, Tombreck 1, Perthshire ScRAP©HES

Record art recording during ScRAP involved capturing photographs and detailed information on the panel dimensions, geology, slope and orientation, carvings and surface features, as well as its surroundings.

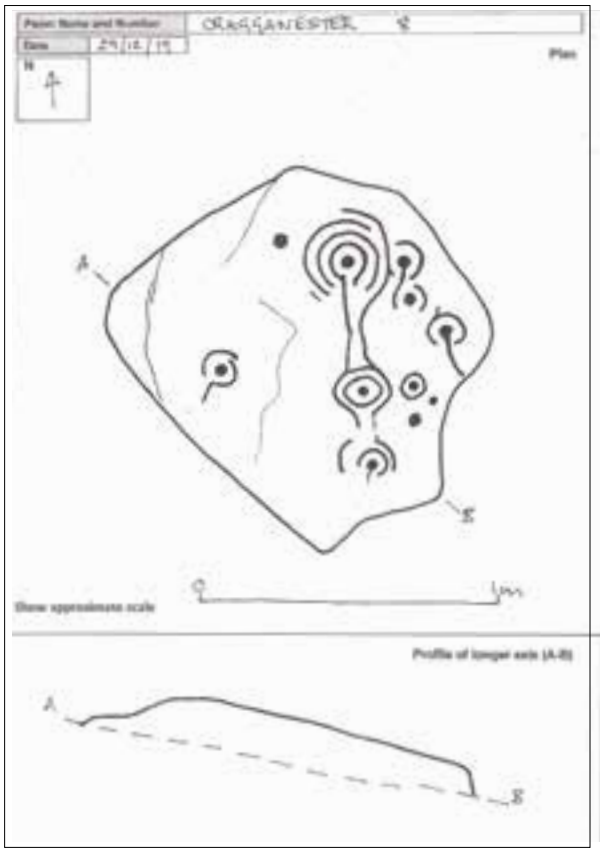
Fieldwork techniques are being demonstrated here by (clockwise from top) members of the ScRAP Team, Callander Team, Whithorn Team, Rock Art Bute Team, and Edinburgh, Lothians and Fife Team ©HES

Artificial lighting can help with the identification of motifs in the field so that they can be more accurately drawn and recorded ©HES

Team working can be incredibly beneficial, not only for dividing up the recording tasks, but also for sharing opinions on the rock art and enjoying the fieldwork experience together ©Tertia Barnett



Map showing the distribution of rock art panels recorded and validated by ScRAP (red dots). Blue dots show the unvalidated panels. See image credits



Panel sketch of Cragganester 8, Perthshire, using the SCRAP recording form ScRAP Killin Team ©HES

The recording approach used during ScRAP involved a combination of spatial, visual and text-based methods. Each method records different information and, used together, capture a broad scale of detail, from the motifs and rock surface to the wider landscape context. These methods are summarised below.

- **Field survey:** Walk-over survey of the area around the panel to identify natural and archaeological features in the vicinity, look for new rock art, and gain a better understanding of the geology and the landscape setting.
- **Spatial recording:** Noting the location of each panel using a hand-held GPS (Global Positioning System) device or a mobile phone to generate a 12-figure grid reference, accurate to within 3–10m.
- **Text-based recording:** Using a standardised form to record the panel dimensions, geology, orientation, physical setting, and relationship to other archaeological features, as well as details of the motifs and rock surface, condition of the panel, and specific threats or risks.
- **Sketches:** Creating sketch plans using standardised drawing conventions showing the area around the panel and the panel itself, including details of the motifs and natural rock surface features.
- **Photographs:** Photographing each panel, with a scale bar and north arrow, to capture the motifs, the panel, and its setting from specific orientations.
- **3D modelling:** Capturing 3D data for each panel using Structure from Motion (SfM) photogrammetry. You can read more about this technique in **Digital Documentation of Rock Art**.

IDENTIFYING ROCK ART

Identifying rock art can be tricky, even when you are in the right place. Complex motifs such as multiple concentric rings clearly have a human origin, but the majority of Scotland's rock art comprises simple cupmarks. These are often weathered and difficult to distinguish from natural features on the rock surface, so need to be examined carefully before they can be firmly identified as 'rock art'. Canmore contains many examples of natural features mistakenly recorded as cupmarks or cup-and-ring marks – in fact over 15% of the 1,600 rock art records investigated by Scotland's Rock Art Project turned out to be natural cup-shaped depressions.

Cup-like features can be formed by a range of natural and human agents: differential weathering of concretions in the rock, natural erosion of certain rock types such as sandstone, actions of molluscs, and even bullet strikes. In many cases it is extremely difficult to distinguish these features from carved cupmarks, but there are some useful clues that can help with identification. For example, if nearby rock surfaces have irregular features resulting from weathering or geological processes, the 'cupmarks' are more likely to be natural. Human-made cupmarks should have a regular, rounded shape when viewed from above, and measure between 2 and 6cm across, although they are sometimes larger. They are usually relatively shallow, with a hemispherical or conical cross-section, smooth internal surfaces, and no sharp or over hanging edges. Sometimes 'peck-marks' (multiple small depressions) from making the carvings are visible inside the cup and are very good indicators of rock art. Features are more likely to be cupmarks if they are arranged in rows or patterns, and if they are on rock types not prone to differential weathering or natural depressions. There is also a higher probability that cup-shaped features are human-made if they are on a rock surface with other definite motifs, or close to clearly identifiable rock art. They are also likely to be cupmarks if they have connecting grooves or are surrounded by one or more concentric rings – although rings are occasionally carved around natural depressions.

It is also helpful to consider the location of the features. Rock art is rarely found in certain contexts, such as sea and loch shores, narrow gorges, steep hillsides, or mountain tops. It is most common in accessible areas with evidence of past or present

Members of the ACFA (Association of Certificated Field Archaeologists) Rock Art Teams discussing the identification of motifs in Glen Lochay, Perthshire ©ACFA

CLOCKWISE FROM TOP LEFT:

Cup-shaped depressions are likely to be prehistoric carvings if they are surrounded by rings. Knockshinne 9, Dumfries and Galloway ScRAP©HES

Circular depressions such as these at Balmae 11, Dumfries and Galloway, are often mistaken for cupmarks ScRAP©HES

These natural features at Bealach Udal, Highland, were originally recorded as cup-and-ring markings ScRAP©HES

Activities like quern stone extraction can produce shapes similar to cup-and-ring markings, as at Broughmore Wood, Stirlingshire ScRAP Callander Team ©HES

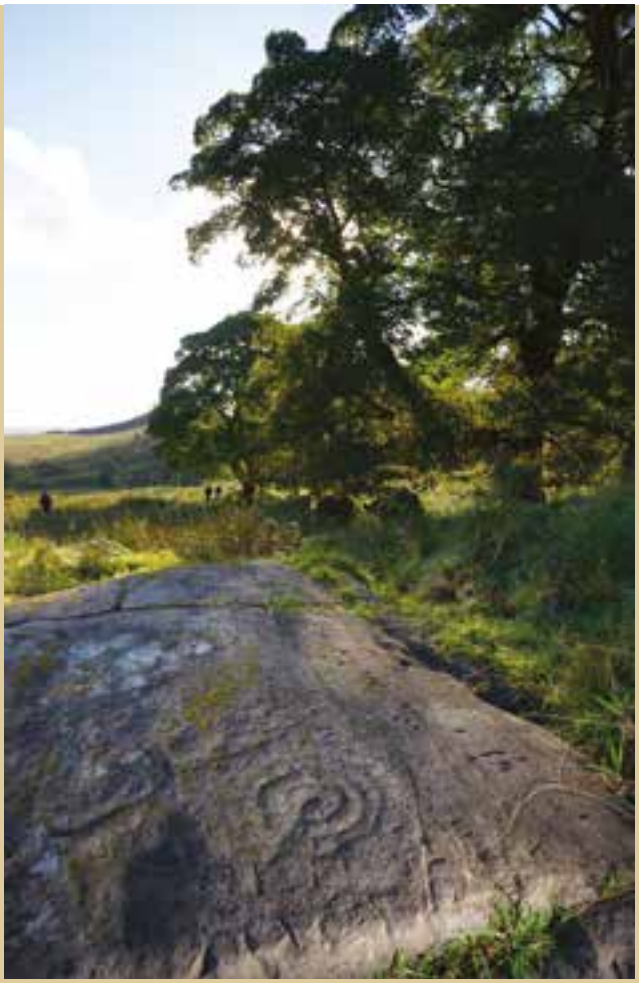
Bait holes for grinding shellfish are frequently recorded as cupmarks ScRAP©HES

Cup-shaped depressions formed by the burrowing action of shellfish such as piddocks are easily mistaken for cupmarks. Markings like these are found on sandstone in coastal areas like Tyninghame beach, East Lothian ©Tertia Barnett

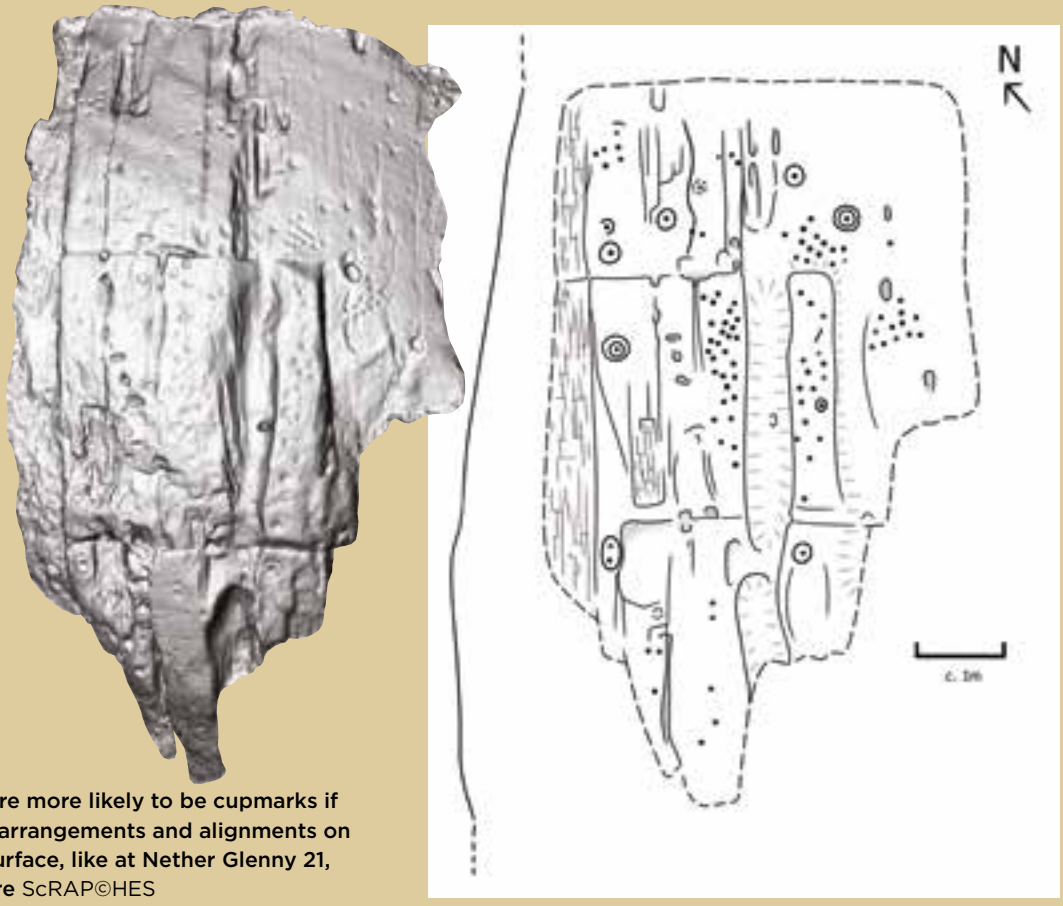
Solution hollows caused by water action are frequently recorded as cupmarks
ScRAP©HES

human activity, especially if there are prehistoric monuments in the vicinity. Cupmarks mainly occur on horizontal or gently sloping surfaces of outcrops and boulders in the open air, rather than on vertical rock faces or in caves and shelters. They are sometimes found on standing stones, in prehistoric burial monuments, and in later structures such as field walls and clearance cairns.

We should not assume that all human-made cupmarks and cup-and-ring marks are prehistoric rock art. Very similar features result from various practical activities. Bait holes – common in coastal locations of north west Scotland – are frequently recorded as cupmarks. These circular depressions, which tend to be larger than typical cupmarks, were used by fishermen for grinding shellfish to cast into the sea as bait. Small quern stone roughouts can also be mistaken for cup-and-ring carvings. A good example comes from Broughmore near Balfron in Stirlingshire where numerous cup-and-ring markings had been recorded along a sandstone ridge. Investigations by the ScRAP Callander Community Team in 2020 and subsequent excavations led by Stirling Council revealed this to be a multi-period stone working site used from prehistory to post-medieval period, and the cups with single rings were small Iron Age quern-stone roughouts.



Cup-shaped depressions are more likely to be prehistoric carvings if they are associated with obvious rock art motifs ©HES



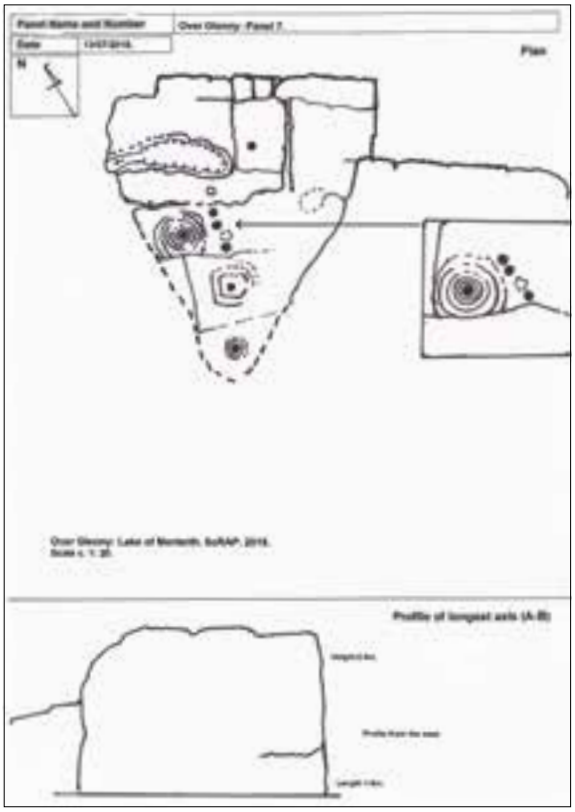
Features are more likely to be cupmarks if they form arrangements and alignments on the rock surface, like at Nether Glenny 21, Stirlingshire ScRAP©HES

SHARING AND CURATING ROCK ART RECORDS

In order to make information about rock art accessible to everyone in the long-term, whether for general interest, research, or management, it is essential that it is properly archived and curated. The central archive for all Scotland's archaeology, buildings, industrial and maritime heritage is managed and curated by Historic Environment Scotland (HES). All the digital data generated by ScRAP have been deposited in HES's digital archive to ensure their preservation and public access now and in the future. Without this resource, the ScRAP data would be vulnerable to damage or irretrievable loss.

It is important to make archived data available for others to view and use, and to regularly update the record with new details. HES's digital archive, including all the ScRAP data, is publicly accessible through the Canmore website. This allows users to search and view archive catalogues, browse digital images, download data, and request files, such as ScRAP's 3D rock art models, for digital download. Making rock art data available on Canmore allows them to be accessed, reviewed, and re-interpreted in new and exciting ways.

The ScRAP website provides a wealth of information about Scotland's prehistoric carvings. It is also a key online resource for users to search and access detailed rock art data, images, and 3D models co-produced with Community Teams during ScRAP. There are various other important online options for contributing and sharing rock art data, such as the platform Sketchfab which ScRAP uses for displaying 3D models. Details of these and other relevant websites are listed at the end of this booklet.



MyCanmore enables anyone to contribute new information and images to existing Canmore records, thus continually updating and enriching our knowledge of rock art. Professionals and members of the public can also report new rock art discoveries to Discovery and Excavation in Scotland (DES), run by Archaeology Scotland. These records are published in the DES Journal and added to Canmore annually.

In addition to being archived in Canmore, the ScRAP data have been shared with the Historic Environment Records (HERs) – a network of regional records managed by the local authority archaeological services. HERs are an important source of information on the archaeology, built heritage, and history of an area, as well as a primary source of information for planning, development-control work, and land management. Sharing rock art data with both Canmore and the HERs helps maintain a consistent record.

The Scotland's Rock Art Project archive in Canmore contains over 1,000 3D models and 16,000 digital images, including digitised panel and location sketches, photographs and 3D model snapshots co-produced with Community Teams ScRAP©HES

CARING FOR ROCK ART

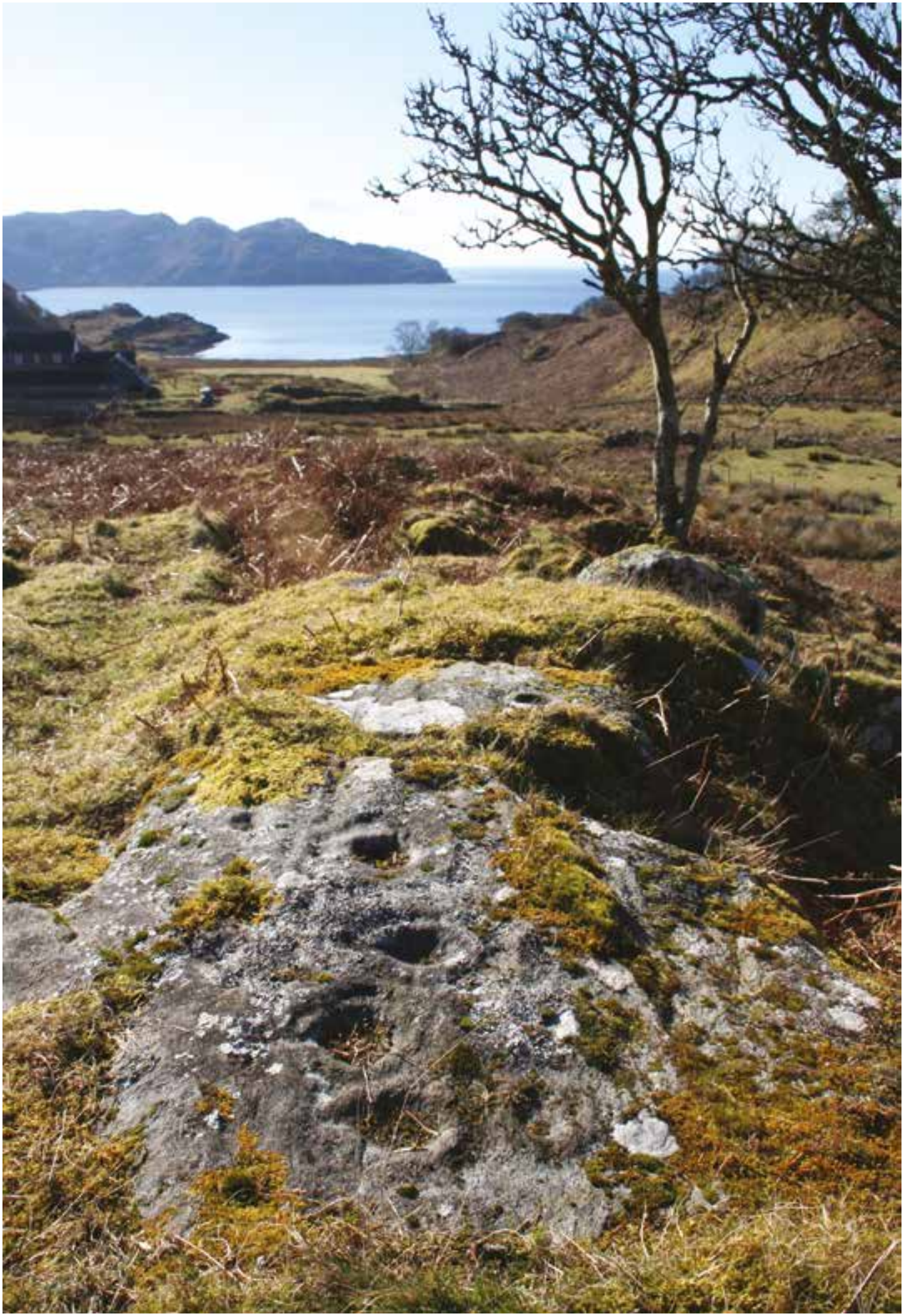
Despite being carved in stone, rock art is very vulnerable and continually deteriorating. Many motifs have eroded to such a degree that they are only visibly under certain lighting conditions or in 3D models, whilst others may have disappeared already. Rock art faces many threats from the weather, climate change, vegetation, animals, and ourselves. It is important that we are aware of these threats so that we can try to prevent or reduce them and preserve our rock art for future generations.

The most persistent risk to rock art, other than human interference, is water. Water acts by weakening and dissolving the matrix that holds the tiny rock particles together, so they become easily abraded or washed away. Although this happens on a microscopic scale, it becomes very noticeable over time. Different types of rock decay at different rates, with softer, sedimentary rocks like sandstone relatively more prone to erosion. Worryingly, climate change is destabilising the chemical balance of certain rock types, particularly sandstone, and enhancing their rate of erosion.

We can't protect rock art from the Scottish weather, but there are some things we can do to mitigate against erosion. In particular, we can minimize our impact when visiting or recording rock art. It is important that we do not remove turf, mosses and lichens that protect the rock surface as this exposes it to the effects of water and wind erosion. Repeatedly uncovering and recovering rock art prevents it developing a protective patina, and accelerates deterioration. Allowing animals or humans to walk or sit on the carved rock surface also speeds up the decay process and should be avoided. The **Rock Art Code**, detailed at the end of this booklet, recommends what to do (and not do!) when visiting prehistoric rock carvings. These guidelines apply to all British rock art and were developed as part of the Northumberland and Durham Rock Art Project.

ABOVE: **Part of a massive, elaborately carved sandstone outcrop at Auchentorlie (Greenland), West Dunbartonshire, damaged by quarrying and threatened with destruction prior to its removal by National Museums Scotland** SC1920442©Courtesy of HES (Dr Euan W Mackie Collection)

LEFT AND OPPOSITE: **Lichen helps protect rock carvings against the effects of wind and rain. Moss is less beneficial as it traps water and its roots weaken the rock matrix** ©Tertia Barnett



TOP LEFT: **A carved rock at Tom nam Clach, Argyll, accidentally damaged during tree-felling operations because it had an inaccurate grid reference** ScRAP Strachur Team ©HES

BOTTOM LEFT: **Tree and shrub roots can damage and split rock art panels if allowed to grow** ©Tertia Barnett

TOP, CENTRE AND BOTTOM RIGHT: **Livestock pose a significant threat to rock art. Their impact can be reduced by avoiding placing feeding bins on or close to panels (Townhead 1, Dumfries and Galloway** ScRAP©HES**), or even fencing off the panels (Drumtroddan, Dumfries and Galloway** ©HES**). Inquisitive cows investigating a new rock art panel at Milton, Dumfries and Galloway** ©Jennifer Roberts

Only a small proportion of Scotland's rock art (about 5% of the total) is protected by law as Scheduled Monuments. This provides statutory protection for monuments of national importance, making it a criminal offence to damage or interfere with them. Scheduling recognises the cultural significance of the rock art by considering a range of criteria, including its archaeological, aesthetic, scientific and social interest. Anyone can submit a request for a rock art panel to be considered for scheduling, and you can find details of how to do this on Historic Environment Scotland's Portal, listed at the end of this booklet.

Six panels in Scotland – Achnabreck, Cairnbaan, Baluachraig and Kilmichael Glassary in Kilmartin, Argyll, together with Drumtroddan and Big Balcraig in Dumfries and Galloway – are in the care of Historic Environment Scotland (HES) and managed as part of their estate. HES monitors the condition of these panels, and ensures that they are conserved sustainably and are accessible to visitors. There is more information about visiting them at the end of this booklet.

Panels that are recorded but not Scheduled have some level of protection against human intervention because they are identified during the planning process for land and building development, although this does not necessarily save them from destruction. There is a danger that rock art becomes damaged by mistake if it has been recorded in the wrong place, or if it has no official record and is overlooked in the planning process. This makes it essential to have an accurate and comprehensive database of rock art.

This extensively carved outcrop with unusual motifs at Ormaig, Kilmartin, Argyll, is one of around 180 rock art panels that are protected as Scheduled Monuments
ScRAP Photography Challenge Prize Winner ©Karen McCurry

LEARNING ABOUT ROCK ART

Providing accessible guidance and information, such as this booklet, plays a valuable role in preserving rock art by encouraging people to be more aware of it. Learning about rock art from an early age is also important for its understanding and future care. Rock art has immense potential for inspiring creativity and imagination in young people and, in recent years, it has been used innovatively as a dynamic learning resource. Motifs have been carved in soap, chalked in playgrounds, woven into comic book stories, and animated in films through projects by Archaeology Scotland, Glasgow University, Kilmartin Museum, and Forestry and Land Scotland, among others.

In March 2021, Forestry and Land Scotland (FLS) in collaboration with Scotland's Rock Art Project and Historic Environment Scotland published the first-ever illustrated rock art learning resource, *A Song in Stone*, incorporating suggestions for learning activities created by Kilmartin Museum's Education Team – you can download the pdf of this resource using the link at the end of this booklet. Glasgow University's ground-breaking work in Faifley, West Dunbartonshire, engaged local school pupils with 'urban' rock art on their doorstep through a range of outdoor and classroom-based activities that drew in the wider community and grew into a larger project, *FaifleyRocks!*. Initiatives such as these are crucial in making rock art more accessible, and re-inventing it in ways that everyone can enjoy, relate to and celebrate today.

.

RIGHT: **Creative activities, like the 'Chalkno Stone' produced by young people in Faifley, inspire learning about rock art** ©Kenny Brophy

BELOW: **Characters like Pix and Derm, shown here, are accessible and authentic. They help to drive the narrative and inspire a human connection in *A Song in Stone*** ©Forestry and Land Scotland by Alex Leonard

VALUING ROCK ART

Rock art is a unique part of Scotland's cultural landscape today. We value it for many reasons – archaeological, aesthetic, spiritual, and cultural, to name a few. Everyone who is aware of rock art has a different sense of its value, based on their own unique experiences, memories, and associations. *Future Thinking on Carved Stones in Scotland*, part of the Scottish Archaeological Research Framework (ScARF), proposes that in order to assess the significance of prehistoric rock carvings, and every form of carved stone, we should consider all their possible values for different communities of interest.

The way we value rock art informs how we care for it now and in the future, yet we know very little about its importance for people today. To better understand how and why people value rock art, ScRAP worked closely over several years with members of its Community Teams and other communities in Scotland. The methods used in this research are also relevant to understanding cultural significance of the wider

Members of ScRAP's Edinburgh, Lothians and Fife Team (top right ©HES) **and Rock Art Bute Team** (above ©Tertia Barnett) **enjoying engaging with rock art during fieldwork**

Community value of rock art is reflected in initiatives such as the Heights of Fodderty Adopt-a-Monument project with Archaeology Scotland to create public access and interpretation for an unusual carved stone rescued from a ditch near Dingwall ScRAP NOSAS Team ©HES

historic environment. Interviews, focus groups and fieldwork with Community Teams produced a picture of the social values for those involved in ScRAP, and the impact of active engagement on these values. Comparing the results of discussions in the early and final stages of ScRAP clearly showed that direct participation frequently altered people's values of rock art.

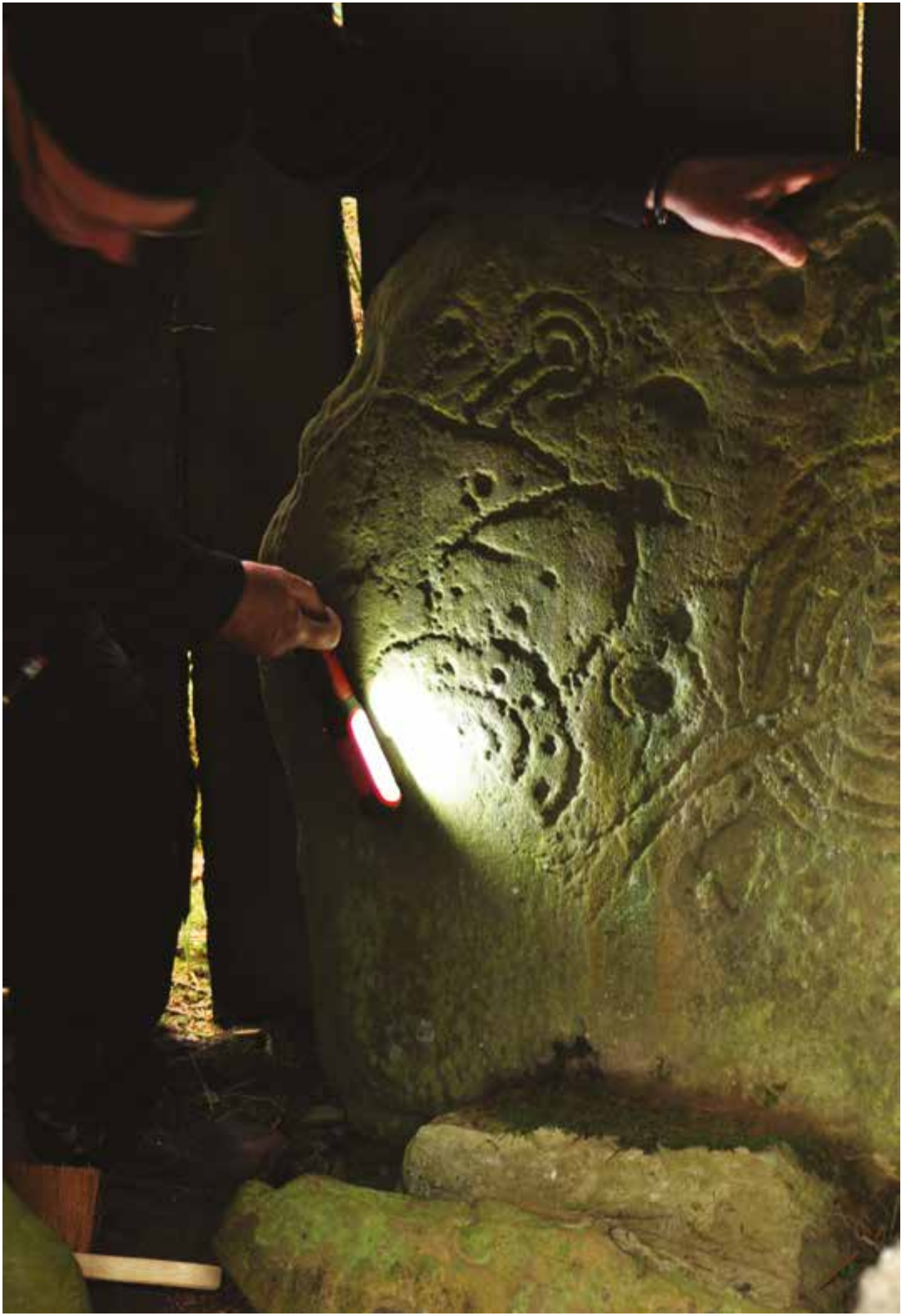
Although a small number of participants had a strong interest in rock art before their involvement with ScRAP, the majority had surprisingly low initial awareness. For many, the excitement of discovering rock art, engaging with it through fieldwork, and wide-ranging discussions and personal reflections on its purposes and meanings enhanced their sense of its significance and place in the wider historic environment. Some Community Teams had a very local focus but, because many participants worked across a wider area, sometimes far from their home base, values were not specifically local. Instead, most people appreciated engaging with the landscape through the sense of wellbeing generated by outdoor exercise in good company.

Changes in people's perceptions of rock art applied across the whole range of values, including spiritual and aesthetic. Critically, this has inspired ScRAP participants with a new enthusiasm for protecting, caring for and sharing their ideas about rock art as widely as possible.

LOOKING FORWARD

Today we know far more about Scotland's rock art than ever before, but we are still at an early stage in our understanding. There is much to learn about its significance to the people who made it, about the relationship between rock art and other prehistoric activities, and about the role of rock art in shared Neolithic and Bronze Age beliefs and ceremonial practices across Atlantic Europe. There are some questions that we have barely started to tackle: where, when and how did this type of rock art originate? How was knowledge of the motifs communicated, and by whom? How did their meanings and value change over time? When and why did the rock art tradition fall out of use? Research over the last thirty years has radically changed our ideas about rock art, but there is still a great need for extensive survey, excavation, and analysis.

Cup-and-ring motifs decorating a surf-board at Clatteringshaw, Dumfries and Galloway ©Jennifer Roberts



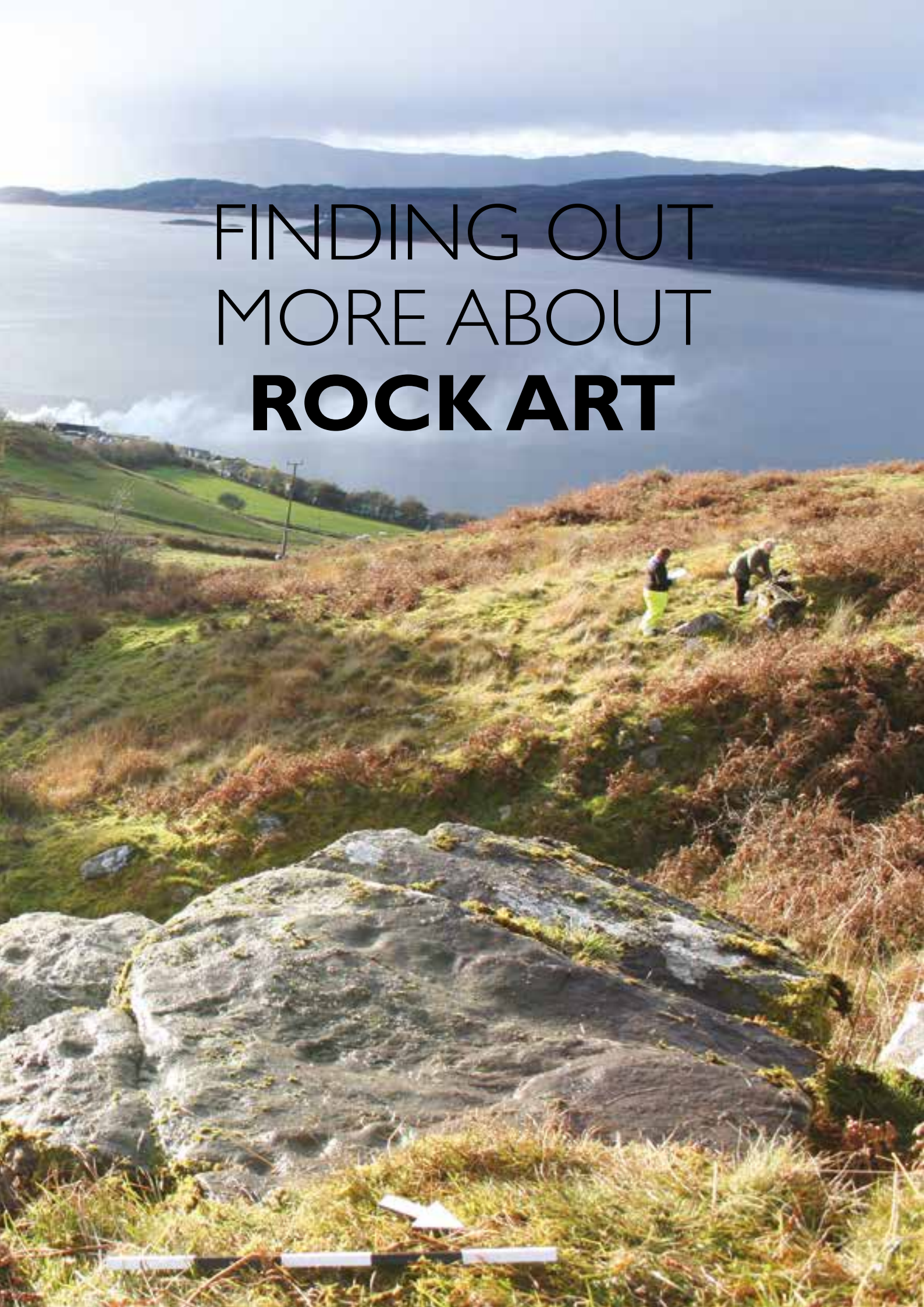
ABOVE: **Community co-creation of rock art motifs on fabric 'panels', produced by Lucy Killoran, as part of the Kenny Brophy's FaifleyRocks! Project** ©Tertia Barnett

RIGHT: **Contemporary artistic interpretation of rock art in Kirkcudbright** ©Tertia Barnett

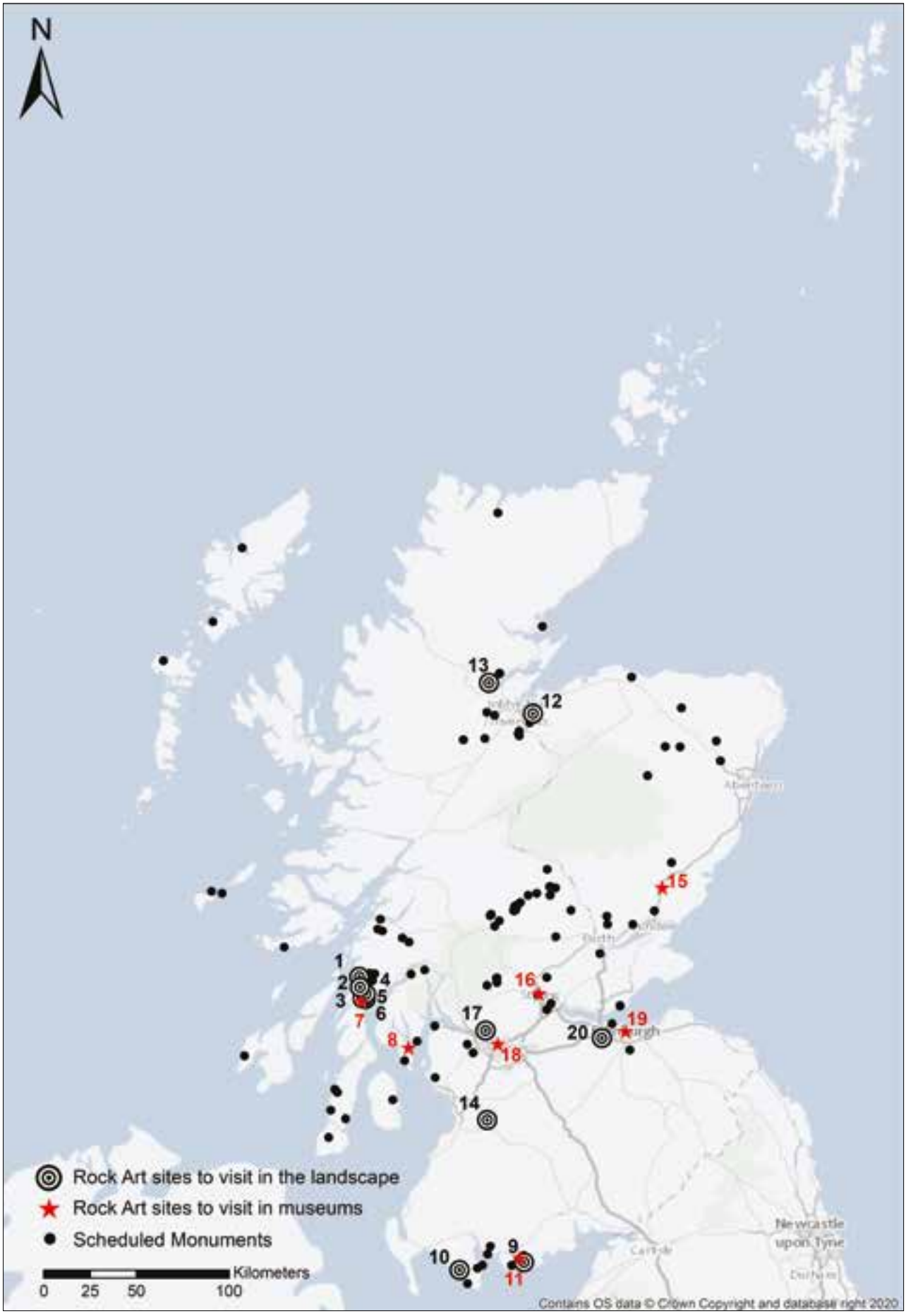
OPPOSITE: **Kirkdale House 4, Dumfries and Galloway** ©Joana Valdez-Tullett

There are other, more contemporary concerns where we need to focus research. As climate change accelerates rock erosion, it is becoming increasingly pressing to understand natural deterioration processes and how best to manage them. We also need to ensure that our records and archives are up to date and accurate to avoid destruction of rock art through land development or unwitting damage.

Most importantly, we need to promote awareness of rock art and make it sustainably accessible to everyone. Social media, the internet, and digital technology provide the mechanisms for doing exactly that, and will continue to offer new opportunities for sharing information as they develop – we just need the human resources and incentive to put them to good use. Community co-production projects like ScRAP and similar initiatives in England have helped to alter public and professional perspectives, and enhance the social value of rock art. Yet there is so much more we can do, and there is enormous potential for engaging people of all ages with rock art in new and creative ways. Scotland's rock art is an amazing and irreplaceable part of our past. It belongs to all of us, and we should all feel empowered to visit, study, care for, celebrate and be inspired by it.



FINDING OUT MORE ABOUT **ROCK ART**


N
13
12
15
1
2
3
4
5
6
7
16
17
19
20
8
18
14
Rock Art sites to visit in the landscape
Rock Art sites to visit in museums
Scheduled Monuments
Kilometers
0
25
50
100
10
9
11
Newcastle upon Tyne
Contains OS data © Crown Copyright and database right 2020

WHERE TO VISIT ROCK ART

If you enjoyed reading this booklet and would like to visit some rock art, the list below offers an excellent cross-section of sites in the landscape and in museums, including some of the best examples in Scotland. They are all publicly accessible and most are signposted. You can find more details and grid references by searching Canmore using the site name or Canmore number to help your search. If you visit any of the sites in the landscape, please remember to always follow the **Rock Art Code**.

Visiting rock art virtually is becoming easier and easier. Online resources provide access to a wealth of images, 3D models and information, and are growing continually. You can find some of the key websites for accessing rock art virtually at the end of this booklet.

LOCATION AND SITE NAME	CANMORE NUMBER
Argyll and Bute	
1. Ormaig, Kilmartin	22860
2. Achnabreck, Kilmartin	39552, 39553
3. Baluachraig, Kilmartin	39453
4. Cairnbaan, Kilmartin	39575, 39586
5. Kilmichael Glassary, Kilmartin	39541
6. Ri Cruin, Kilmartin	39456
7. Kilmartin Museum, Kilmartin	
8. Bute Museum, Rothesay, Bute	
Dumfries and Galloway	
9. High Banks, Kirkcudbright	64442, 368533-37
10. Drumtroddan, Whithorn	62767, 62794
11. Stewartry Museum, Kirkcudbright	
Highland	
12. Clava Cairns (Balnuarin of Clava), Inverness	12257, 14277, 14279
13. Heights of Fodderty, Dingwall	351657
Ayrshire	
14. Ballochmyle, Mauchline, Ayr	43557
Angus	
15. Meffan Museum and Art Gallery, Forfar	
Stirlingshire	
16. The Smith Art Gallery and Museum, Stirling	
Central Belt	
17. Auchnacraig, Faifley, West Dunbartonshire	44536, 368361
18. Kelvingrove Art Gallery and Museum, Glasgow	
19. National Museum of Scotland, Edinburgh	
20. Tormain Hill, Ratho, Midlothian	50365

WHAT TO DO IF YOU FIND NEW ROCK ART

If you think you have found new rock art, there are several things you can do:

First, check that it is prehistoric rock art rather than a natural feature or something created at a later date (see **Identifying Rock Art**). It is always helpful to get a second opinion, and to go back in different light conditions when the features may look different.

Next, check that it is not already recorded. Useful map-based searches are Canmore and Pastmap, as well as the Scotland's Rock Art Project website. Bear in mind that grid references and descriptions for some existing records may not be accurate unless the panel has been recorded by ScRAP.

Once you are sure that the panel has not been recorded before, it is a good idea to contact **Historic Environment Scotland and your local authority archaeologist** with the following information for further verification:

- Ordnance Survey grid reference taken with a GPS or mobile phone
- Description of the motifs, the panel, and how to find it
- Photographs clearly showing the motifs, the panel, and its landscape setting.

When the rock art has been verified as a new discovery, you can publish details about it through Discovery and Excavation Scotland (DES). This information will then be added to Canmore. You can find more information about DES in the list of **Useful Websites and Resources** below.

Contact Historic Environment Scotland at: customer@HES.scot

Contact details for local authority archaeologists can be found on the website in the list of **Useful Websites and Resources**.

ROCK ART CODE

PLEASE DO:

- leave the carved rocks and other archaeological features as you find them
- keep your impact on the rock surface to an absolute minimum
- seek permission from the relevant owner or manager to visit sites
- respect the environment and follow the Scottish Outdoor Access Code

PLEASE DON'T:

- remove turf from buried rock art panels. A freshly exposed rock surface is very vulnerable to erosion
- remove lichen, mosses and other growths from rock art panels. This can seriously damage the carvings and weaken the rock surface
- attempt to remove graffiti, chalk, or anything else on the rock
- use any substances (including water) to 'clean' rock surfaces
- use brushes with stiff bristles (plastic or wire) to clean the rock. If you wish to remove leaves or animal droppings from the carvings for your photographs then use a soft brush or your hands
- use any metal tool (e.g. a trowel or knife) to 'clean' the carvings
- add chalk or enhance the carvings using any other substance (this may interfere with accurate dating of the surface)
- use any recording technique that involves direct and/or repeated contact with the surface (e.g. wax rubbing)
- scratch or chalk your name or messages on or close to the carved panels
- walk or drive over carved panels
- light fires or candles on the rock surface or the carvings
- use sticky tape or other adhesives to fix scales or anything else to the rock

USEFUL WEBSITES AND RESOURCES

ROCK ART AND ARCHAEOLOGY

Scotland's Rock Art Project: https://www.rockart.scot/ For searching Scotland's rock art database and map, information about rock art, and much more

England's Rock Art database: https://archaeologydataservice.ac.uk/archives/view/era_eh_2009/ For searching and viewing England's rock art database

Megalithic Portal: https://www.megalithic.co.uk/ An interactive database and map of ancient monuments, enriched and continually updated with input from thousands of photographers, archaeologists, locals and visitors

Modern Antiquarian: https://www.themodernantiquarian.com/home/ An interactive resource for news, information, images, folklore and weblinks on the ancient sites across Britain, Ireland and Europe

Northern Antiquarian: https://megalithix.wordpress.com/tna/ A platform for amateurs and professionals to meet and work together, exploring monuments such as stone circles, standing stones, prehistoric tombs and other ancient remains

British Rock Art Collection: http://ukra.jalbum.net/brac/ Fantastic collection of photographs and drawings of over 1200 rock art sites in Britain, organised by country, region and area, compiled by Dutch rock art enthusiasts Jan Brouwer and Gus Van Veen

EuroPreArt (European Prehistoric Art): www.europreart.net A collection of photographs, drawings and descriptions of rock art from Ireland, Denmark, France, Sweden, Italy, Portugal and Spain, as well as advice on caring for rock art

Bradshaw Foundation: http://www.bradshawfoundation.com/ Global network of rock art organisations, archives, projects and news with links to relevant archives around the world

Canmore: https://canmore.org.uk/ The online catalogue of Scotland's national historic environment archive, containing over 1.3 million records for archaeology, buildings, industrial and maritime heritage

MyCanmore: https://canmore.org.uk/user-guide/mycanmore Online system for members of the public to enhance the national record by uploading images and comments directly into Canmore

PastMap: https://pastmap.org.uk/map For searching Scotland's historic environment using maps, historical maps, aerial photographs and other data

RELEVANT ORGANISATIONS AND INFORMATION

Historic Environment Scotland (HES): https://www.historicenvironment.scot/ The lead public body set up to investigate, care for, promote and celebrate Scotland's historic environment

Our Place in Time: https://www.historicenvironment.scot/about-us/who-we-are/our-place-in-time/ Historic Environment Scotland's overarching strategic framework for caring for Scotland's past

Historic Environment Scotland's Portal: https://portal.historicenvironment.scot/ For information on Scheduled Monuments, Scheduling applications, and downloadable datasets. You can propose a monument for scheduling by completing an application form which is available here: https://www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/scheduled-monuments/propose-a-site-for-scheduling/

Scheduled Monument Consents Policy: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=46d8502d-7059-416b-940e-aa250102112d For explanations about Scheduled Monuments and how they are protected through the work of HES

Historic Environment Scotland's Sketchfab account: https://sketchfab.com/HistoricEnvironmentScotland/models For viewing high resolution 3D models of rock art recorded by the Digital Survey and Innovation Team

Local Authority Archaeologists: https://www.algao.org.uk/ Archaeological services working within local government to encourage identification, recording, protection, management, interpretation and promotion of archaeological sites and monuments, including assessing planning applications. Local Authority Archaeologists also develop and maintain the Historic Environment Records/Sites and Monuments Records (HERs/SMRs), a comprehensive public information resource for understanding and enjoying the local historic environment

Scotland's Archaeology Strategy: http://archaeologystrategy.scot/ Overarching strategy and action plan for enhancing understanding, caring and protecting, and encouraging greater engagement for all of Scotland's archaeology

Future Thinking on Carved Stones in Scotland: https://scarf.scot/thematic/future-thinking-on-carved-stones-in-scotland/ Framework designed to link, inspire, mobilise and help direct the efforts of anyone with an interest in or responsibility for carved stones of all types in Scotland

Scottish Archaeological Research Framework (ScARF): https://scarf.scot/about-scarf/ The key research resource for Scottish archaeology, providing an overview of the subject and a series of relevant research questions to guide future studies

National Committee on Carved Stones in Scotland (NCCSS): http://www.carvedstones.scot/ Highlights the opportunities and issues for Scottish carved stones of all periods and promotes their understanding, appreciation and care. This website also includes a link to the useful HES policy and guidance document Carved Stones: Scottish Executive Policy and Guidance (2005): http://www.carvedstones.scot/uploads/4/4/0/3/44032535/_carved-stones-scottish-executive-policy.pdf. This document is currently being updated and will be replaced by 'Managing Change in the Historic Environment Guidance Note'.

Forestry and Land Scotland (FLS) Outdoor Archaeological Learning Resources: https://forestryandland.gov.scot/what-we-do/biodiversity-and-conservation/historic-environment-conservation/learning The agency of the Scottish Government charged with managing Scotland's national forests and land. FLS also encourages people of all ages to be inspired by Scotland's rich cultural heritage and historic environment through a range of archaeological learning resources

A Song in Stone: https://forestryandland.gov.scot/what-we-do/biodiversity-and-conservation/historic-environment-conservation/learning/a-song-in-stone Link to the downloadable pdf of Forestry and Land Scotland's fabulous rock art learning resource

Archaeology Scotland: https://archaeologyscotland.org.uk/ A leading educational charity working to inspire people to discover, explore, care for and enjoy Scotland's archaeological heritage

Discovery and Excavation in Scotland (DES): https://archaeologyscotland.org.uk/join-us/discovery-and-excavation-scotland/ An accessible, comprehensive, up-to-date and informative guide to archaeological work being undertaken across Scotland. DES records and publishes fieldwork undertaken by commercial units and archaeologists, local societies, university departments, community groups and independent archaeologists in Scotland each year. This is also where you can upload information about new discoveries, which are annually published in the DES Journal and transferred to Canmore

Archaeology Scotland Adopt-a-Monument: https://archaeologyscotland.org.uk/current-projects/adopt-a-monument9/ A nation-wide Community Archaeology scheme that provides volunteer groups with the practical advice and training they need to care for and conserve their local heritage

Scottish Outdoor Access Code: https://www.outdooraccess-scotland.scot/ Explanation of responsible behaviour we must all adopt when visiting the outdoors in Scotland

DIGITAL RESOURCES

Sketchfab: https://sketchfab.com/ Online platform for sharing and viewing 3D models

Meshlab: https://www.meshlab.net/ Open source software for processing, editing, visualising and enhancing 3D models

Agisoft Metashape: https://www.agisoft.com/ Software to perform photogrammetric processing of digital images to create 3D models. The software also generates 3D spatial data for GIS applications, cultural heritage documentation, and visual effects production

QGIS: https://qgis.org/en/site/ Open source Geographic Information System (GIS) to create, edit, visualise, analyse and publish geospatial information

FURTHER READING

Barnett, T, Ritchie, M and Sharpe, K 2021 *A Song in Stone.* Forestry and Land Scotland

Barnett, T and Sharpe, K eds 2010 *Carving a Future for British Rock Art*. Oxbow Books

Beckensall, S 1999 *British Prehistoric Rock Art*. Tempus

Bradley, R 1997 *Signing the Land: Rock Art and the Prehistory of Atlantic Europe*. Routledge

Bradley, R 2020 *A Comparative Study of Rock Art in Later Prehistoric Europe. Elements in the Archaeology of Europe.* Cambridge University Press

Doyle, P 2020 *Pathways to the Cosmos: the alignment of megalithic tombs in Ireland, Britain and Atlantic Europe*. Wordwell Ltd

Jones, A, Freedman, D, O'Connor, B and Lamdin-Whymark, H 2011 *An Animate Landscape: Rock Art and the Prehistory of Kilmartin.* Windgather Press

Mazel, A, Nash, G and Waddington, C eds 2007 *Art as a Metaphor: The Prehistoric Rock Art of Britain*. Archaeopress

Morris, R 1977 *The Prehistoric Rock Art of Argyll.* Dolphin Press

Morris, R 1979 *The Prehistoric Rock Art of Galloway and the Isle of Man.* Blandford Press

Morris, R 1981 *The Prehistoric Rock Art of Scotland (except Argyll and Galloway).* BAR, Archaeopress

Scott, D and McHardy, S 2020 *The Stones of the Ancestors: Unveiling the Mystery of Scotland's Ancient Monuments.* Luath Press

Shee Twohig, E 1981 *The Megalithic Art of Western Europe.* Clarendon Press

Simpson, J Y 1866 On ancient sculpturings of cups and concentric rings, etc. *Proceedings of the Society of Antiquaries of Scotland* 6 (1864–1866) Appendix: 1-471

Thomas, A 2016 *Art and Architecture in Neolithic Orkney: Process, Temporality and Context.* UHI Archaeology Institute Research Series 1. Archaeopress

Valdez-Tullett, J 2019 *Design and Connectivity: the Case of Atlantic Rock Art.* Archaeology of Prehistoric Art 1. BAR Publishing

ACKNOWLEDGEMENTS

The Scotland's Rock Art Project (2017–2021) was funded by the Arts and Humanities Research Council. It was hosted by Historic Environment Scotland, in collaboration with Edinburgh University School of History, Classics and Archaeology, and Glasgow School of Art School of Simulation and Visualisation.

Scotland's Rock Art Project Team:
Dr Tertia Barnett (Principal Investigator)
Dr Joana Valdez-Tullett (Research Assistant)
Linda Marie Bjerketvedt (Data Analyst)
Frederick Alexander (Digital Archivist)
Dr Stuart Jeffrey (Co-Investigator, Glasgow School of Art)
Dr Guillaume Robin (Co-Investigator, Edinburgh University)
Maya Hoole (Research Assistant Maternity Cover 2018–2019)

Acknowledgements:
The Scotland's Rock Art Project Team are extremely grateful to its funding body, the Arts and Humanities Research Council, its partners (Kilmartin Museum, Archaeology Scotland, and North of Scotland Archaeological Society), and all the organisations and individuals that have been involved with and supported the project. We are also indebted to the many landowners and farmers who generously and often enthusiastically collaborated with us and our Community Teams during our fieldwork.

In particular, we would like to give our special thanks to our colleagues from Historic Environment Scotland; Rebecca Jones, Rebecca Bailey, Maya Hoole, Nicki Hall, Dave Cowley, Mike Middleton, Lucasz Banaszek, Helen Bowman, Lyn Wilson, Al Rawlinson, Callum Graham, Laura MacKenzie, Michael Elliot, Melanie Bruhn, Colin Purcell, Kevin Grant, Craig Stanford, Graham Ritchie, Alasdair Burns, Santiago Arribas, Zoe Ballantine, and the ScRAP Project Board; John Raven, Alex Adamson, Eve Boyle, Craig Marshall, Phil Richardson (Archaeology Scotland).

We were privileged to have had the excellent guidance and support of the ScRAP Advisory Board; George Currie, Alison Sheridan, Kenny Brophy, Andy Jones, Richard Bradley, Matt Ritchie, Sally Foster, Sharon Webb, Hugo Anderson-Whymark, Antonia Thomas, Gavin MacGregor, Gabriel Cooney, Cara Jones, and we extend our immense thanks to them all.

We also gratefully acknowledge the many and varied valuable contributions of Sarah Scott, Lucy Killoran, Kirsty Lilley, Aaron Watson, Danny Dutton, Dr John Holliday, David and Jean Newman, Ken Williams, and the 2018 and 2019 Kilmartin Field School Teams.

The ScRAP website and database were created and supported by Horisk Ltd, and promotional material was designed by Resolve-Creative. This booklet was designed by Chris Bell.

Finally, we would like to acknowledge the incredible contribution of all our Community Team members, listed below, who breathed so much life into the project and carved an invaluable legacy for Scotland's rock art.

Scotland's Rock Art Project Community Teams:
ACFA (Association of Certificated Field Archaeologists) Team North, Team South and Team West: Richard Anderson, Hilary Fawcett, Margaret Gardiner, Eric Gardner, Sue Hothersall, Susan Hunter, Kath Kane, Libby King, Barry Levine, Kenneth Mallard, Dorothy Marshall, Ian Marshall, Helen Maxwell, Christine McDiarmid, Dugie Macinnes, Chris Morrison, Janie Munro, Wendy Raine, Katherine Scott, Michael Scott, Ailsa Smith, Edward Smith, Ewen Smith, Ross Wood

Callander: Nick Parish, Mairi Osbourne

ELF (Edinburgh, Lothians and Fife): Trevor Cowie, Alun Davies, Claire Dixon, Steve Farrar, Alan Forgie, James Garry, Francesco Germi, Hilda Hermann, Graham Ritchie, Douglas Ledingham, Su Kille, Tim Kille, Lindsay Purves, Sarah Scott

Killin: Andrew Powell

Kilmartin: Pat Batty, Dave Batty, Andrew Ford, Julia Hamilton, Niell Malcolm, Will Rudd, Margaret Rudd, Dave Salmon, Alan Steele

Kirkcudbright: Lisa Allen, John Allison, Colin Brydon, Bill Craig, Vivien Dania, Mike Dean, Craig Fabian, Tom Marshall, Jennifer Roberts, Jerry Slater, John Smith, Rodger Smith

NOSAS (North of Scotland Archaeological Society): Beth Blackburn, Tim Blackie, Jean Bowker, Ken Bowker, Karen Clarke, Anne Cockroft, Anne Coombs, Dave Coombs, Jonie Guest, Richard Guest, Anji Hancock, Paul Hancock, Bob Jones, Rosemary Jones, Linda Lamb, Meryl Marshall, Anne MacInnes, James McComas, Madeline Robinson, Roland Spencer-Jones, Alan Thompson, John Wombell, Trina Wombell

Rock Art Bute: Jessica Herriot, Susan Hothersall, Donald Kinnear, Isabell MacArthur, Jean McMillan, Barbara Rimmington, Isobel Strong, Anne Speirs, Janet O'Sullivan, Pat O'Sullivan, Neil Owen, Marc Vanpee

Strachur: Freda Bos, Fiona Campbell, Joe Campbell, Moira Clinch, Les Earle, John McFadgen, Susan Gaffney, Patrick Gibb, Derek Prescott, Hamish Stewart, Lorraine Stewart, Iain Wilkie

Whithorn: Peter Buxton, Alex Dinsmore, Ros Francis, Heather Jameson, Kate Penaluna, John Pickin, Isla Scott, David Smyth, Ruaridh Soutar, Mark Thomas, Julia Muir-Watt

Image credits:
Image of Witches Stone on page 16 reproduced with kind permission of the Society of Antiquaries of Scotland from Volume 6, *Proceedings of the Society of Antiquaries of Scotland*, in appendix 'On ancient sculpturings of cups and concentric rings &c.' by J Y Simpson. Plate IX 'Cromlechs at Ratho and Clynnog-Fawr'

Image of Letham Grange on page 24 reproduced with kind permission of the Society of Antiquaries of Scotland from Volume 6, *Proceedings of the Society of Antiquaries of Scotland*, in appendix 'On ancient sculpturings of cups and concentric rings &c.' by J Y Simpson. Plate XX 'From Weem at Letham Grange, Forfarshire'

Image of Cairnbaan on page 24 reproduced with kind permission of the Society of Antiquaries of Scotland. Ref 00500: 'Drawing of cupmarks and cup-and-ring marks on rock face at 'Carnban, Argyleshire', with measurements. Signed C Maclagan.', DP 285130, SAS 467

Image of Craigie Hill on page 32 reproduced with kind permission of the Society of Antiquaries of Scotland from Volume 6, *Proceedings of the Society of Antiquaries of Scotland*, in appendix 'On ancient sculpturings of cups and concentric rings &c.' by J Y Simpson. Plate XV 'Kist-vaen, at Craigie-hill, Linlithgowshire'

The maps in this booklet were produced with ESRI ArcGIS Desktop 10.6. The relevant licenses associated with specific maps are as follows:

Maps on pages 17, 44, 59 and 78 created by ScRAP using Historic Environment Scotland and Ordnance Survey data ©Historic Environment Scotland – Scottish Charity No. SC045925 © Crown copyright and database right (2021). Contains public sector information licensed under the Open Government Licence v3.0

Maps on pages 18, 40, 41 and 44 created by ScRAP using a Digital Terrain Model 5m ©Bluesky International Limited & Getmapping Plc

Map on page 18 created by ScRAP using British Geological Survey ©UKRI 2021. Contains public sector information licensed under the Open Government Licence v3.0

Maps on page 40 and 44 created by ScRAP using OS licenced data ©Ordnance Survey licence number 100057073 ©Copyright and database right 2020

SCOTLAND'S ROCK ART PROJECT

Over 4000 years ago, early farming communities carved strange symbols onto thousands of rocks scattered across the landscape. This prehistoric rock art is one of the most mysterious and neglected aspects of Scotland's ancient past. We still know little about why the carvings were made or their importance to the people that created them, but new research is bringing fresh insights and understanding.

This booklet was produced and published by Scotland's Rock Art Project (ScRAP) to raise awareness and appreciation of these unique carvings.

ScRAP was a five-year (2017–2021) community co-production programme funded by the Arts and Humanities Research Council. It was based at Historic Environment Scotland and worked in collaboration with Edinburgh University's School of History, Classics and Archaeology, and Glasgow School of Art's School of Simulation and Visualisation. The project was partnered by Archaeology Scotland, Kilmartin Museum, and the North of Scotland Archaeological Society.

The booklet was written by Tertia Barnett, Joana Valdez-Tullett, Linda Marie Bjerketvedt, Frederick Alexander, Stuart Jeffrey, Guillaume Robin and Maya Hoole.

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

Arts & Humanities Research Council

SCHOOL OF SIMULATION AND VISUALISATION THE GLASGOW SCHOOL OF ART

THE UNIVERSITY OF EDINBURGH