

A 50 year success story

Quarries & Nature





We have many good examples across the country of really beneficial outcomes for nature that have resulted from mineral extraction. The MPA's Biodiversity Awards have been really important in inspiring people to see some of the possibilities at hand and setting out those examples of best practice. With a little bit of imagination and forethought, we can actually achieve a great deal for nature as well as extracting the resources we need for different kinds of developments.

Tony Juniper, Chair, Natural England

Restored quarries are incredibly important for bird life, because they give us a kind of blank canvas to create new habitats for species which are really struggling. They form part of a joined-up network of habitat in the wider landscape so that species can be more resilient to the challenges they face. Partnership is key and one of the things I love about quarry restoration, is that it's nature organisations, planning authorities, quarrying companies and local communities all working together to create new habitats.

Beccy Speight, Chief Executive Officer, RSPB

Let's celebrate the partnership between The Wildlife Trusts and members of the Mineral Products Association over many years, which has been of huge benefit to wildlife. We need to not only put nature into recovery – but also the relationship between people and nature into recovery. My message to members of the MPA is that partnership working, including with Wildlife Trusts, will become increasingly important and if we can do that right we can achieve some really good outcomes for people and for the environment.

Craig Bennett, Chief Executive Officer, The Wildlife Trusts

Quarries . . . Uniquely delivering for nature



Within the pages of this book we have captured just some of the countless fantastic achievements of this essential industry in supporting nature recovery over the last

50 years. I admit it's been a tall order, if only because of the scale of the task, so I hope that we have done the mineral extraction and mineral products sector justice.

Although until the middle of the last century the restoration of quarried land was largely left to nature, the results are still clear to see and make an important contribution to wildlife conservation. Today, however, the way a quarry will be restored is in the 'mind's eye' of geologists, planners and ecologists who work together on quarry design long before activity begins on the ground. New mineral extraction sites are engineered in a systematic process in just the same way as a building, bridge or a tunnel – they too are the result of detailed geological, technical, commercial, operational and environmental evaluation.

Quarries, when visible, can look just like holes in the ground to the untrained eye. For some they are unwelcome, intrusive and create impacts they would prefer took place elsewhere. But unlike virtually every other form

of development, minerals – mainly for construction and industrial uses – can only be dug where they lie. If these minerals are located close enough to where they are needed, and can be conceived and worked in accordance with national and local planning policies, then planning permission may be granted. This is by no means guaranteed and helps ensure that any new proposal is well thought through, communicated and justified.

Like it or not, to live and work in a civilised built environment with modern homes, schools, hospitals and workplaces, supported by efficient transport infrastructure, and resilient energy and water systems, we need minerals and mineral products from quarries and their manufacturing plants. That is the need which the planning system seeks to balance with environmental considerations when planning permission is sought.

This is neither a quick nor easy process. It can take up to 15 years to advance from identifying a potential site to securing approval to commence extraction. Typically, quarries can operate for 10 to 20 years, and often longer for rock quarries. Unlike housing and infrastructure projects, which depend on mineral products, quarries are long-term developments. After the initial impact of opening a new quarry it soon becomes part of the surrounding landscape and part of the community.

The industry's stewardship of our precious landscape – albeit temporary – can be measured in decades. As a quarry

progresses, particularly for sand and gravel extraction, the process of reclaiming the land, improving the drainage or modifying the landform often attracts 'temporary nature' well before the extraction and restoration is complete. Ultimately the land is recycled having been borrowed and the force of nature takes over, encouraged by well thought out quarry design and ongoing land guardianship.

No wonder then that the industry has created – and continues to manage – hundreds of SSSIs and nature reserves nationwide. Such is the extent of the industry's commitment to nature that the MPA has developed its own 'National Nature Park' which brings together more than 80 nature reserves created through quarry restoration. And unlike other sectors that are subsidised, quarry restoration is all driven by the mineral products industry – it is 'private money for public goods'. No handouts have funded the 1.5 million trees or 100 kilometres of new hedgerows we have planted, and that's only in the last 10 years!

As more of our once rural landscape is given over to intensive agriculture and our urban fringes grow and become infilled, former quarries are seen as increasingly important as wildlife havens and oases for biodiversity.

And in key mineral bearing areas – from our major river valleys of sand and gravel to the plains and hills of limestone, granite and sandstone – restored quarries create corridors for nature which deliver bigger, better and more joined-up landscapes and naturally fulfil the Lawton principles for improving the country's ecological network.

The results are stunning and the legacy profound, as we hope our Quarries & Nature work testifies. I am equally proud of both the essential contribution the mineral products industry makes to our economy and to our quality of life, and also the vital role quarries play in nature recovery. It really deserves greater recognition.

Our industry relies on the unbridled passion and unrivalled expertise of our people, particularly quarry managers and their teams, supported by geologists, planners and our own professional environmentalists who don't just talk a good game but are serious practitioners delivering nature recovery on the ground across the country. This passion and these skills will be vital as we all respond to the twin challenges of climate change and loss of biodiversity. In short, Net Zero, Net Gain.

Throughout the last 50 years the mineral products sector has shown again and again how it has enhanced biodiversity, created net gain and contributed to nature recovery whilst most industry sectors have barely begun. Critical to this is our Bioersity Strategy now in its twelfth year and once again where we are leading the field. Our member companies must take the credit for all the great work featured in this publication. Quarries uniquely deliver for nature. Long may it continue, for this generation and the next.

*Nigel Jackson
Chief Executive
Mineral Products Association*



Vital contribution to nature recovery

It's 50 years since the first awards celebrating the unique contribution of restored quarries to nature recovery.

Back in 1971 the UK's Sand and Gravel Association, one of the organisations that merged with others to form the Quarry Products Association which became the Mineral Products Association, held the first awards celebrating success in the restoration of quarries. Indeed, the first known quarry restoration plans were devised and implemented in the preceding decades, and today many of these sites are among the country's best known nature reserves and country parks.

Quarrying is a temporary land use which may disrupt nature in the short term, but is proven to enhance biodiversity in the long term.

Yet one of the mineral product industry's best kept secrets is still the unique and significant role that quarry restoration plays in long-term nature recovery and sustainable conservation. Maybe that's because by the time a well-restored quarry scheme has come to fruition, most people have forgotten that the site once provided essential materials for the places where they live, work and play.

In England alone there are over 2,000 active quarries, covering 64,000 hectares (that's just 0.1% of the country's land area). All of this land is under temporary stewardship of mineral operators and all of it will be restored after quarrying.

That wasn't always the case. Until the second half of the 20th century most mineral extraction sites were effectively completed and left for nature to take over, the infertile ground creating ideal habitats for rarer species. Quarry restoration first became formalised to regain high quality farmland, but priorities have changed over the years with biodiversity key to the design of every restoration scheme, along with considerations such as connection to the wider landscape, recreation, flood alleviation, water quality and carbon sequestration.



A legacy of better biodiversity

Each restored site is an opportunity to create a better landscape, where rare and endangered species can thrive – from wetlands to heathlands to woodlands.

By 2021 MPA members had created over 83 sq km of priority habitat supporting nature recovery with a further 110 sq km pledged in approved restoration plans, areas the size of Nottingham and Liverpool respectively.

And today more than 80 restored quarries make up the MPA's 'National Nature Park' (see map on page 57). This unique ability to create areas for nature to thrive takes on a whole new perspective with the introduction of the Government's Environment Bill that will oblige all new developments to deliver an overall increase – a 'net gain' – in biodiversity.

No other industry comes close to achieving this – indeed, the mineral products sector was restoring land to support nature recovery decades before the term 'net gain' was coined. No surprise then that the MPA was the first trade association to publish a biodiversity strategy and then reviewed and updated it in 2019. The sector remains far ahead of the vast majority of industry by having a long lasting strategy.

Restored mineral workings offer one of biggest habitat expansion and nature recovery opportunity across large swathes of the UK.

The industry's Restoration and Biodiversity awards feature specific accolades for biodiversity, celebrating and awarding outstanding work to conserve and enhance wildlife through site and land management and restoration. And the landscape-scale award in partnership with Natural England recognises schemes that due to their size are clearly contributing to the principles 'bigger, better and more joined up' set out by Professor Sir John Lawton in the review of England's wildlife sites Making Space for Nature (2010).

Of course, although biodiversity features prominently in most schemes, restoration is also about making appropriate use of land with some sites being restored back to agricultural use, or for recreation, and in some cases for new development – including housing, commercial and leisure uses.

The quarrying industry was the first sector in the UK to implement a biodiversity strategy.

The outstanding successes of quarry restoration are made possible thanks to constructive partnerships that MPA members have built with local authorities, conservation organisations and others. Most important of all is the need to recognise our colleagues across the industry – quarry managers, planning managers, restoration managers and their teams whose passion and professionalism continues to deliver a longstanding and exceptional legacy.



Delivery through partnerships

While geology, soils and hydrology, as well as the surrounding landscape will fundamentally determine the type of restoration scheme achievable, the aspirations of the planning authority, conservation groups and the local community are key, as are the requirements of local and national policy.

Mineral extraction takes place over many years. Companies have a long-term presence in an area and community, providing employment as well as essential materials. The industry has long recognised that public engagement and maintenance of good relationships is vital for building mutual understanding and trust.

There are always significant constraints and often conflicting demands that need to be managed. Such challenges require contributions from a wide range of experts – both within and external to mineral companies – to help navigate a course to reach an agreed and approved restoration scheme. Because restored sites leave a long-lasting legacy, quarry operators invest a huge amount of resource in the development and implementation of restoration schemes. Once restoration is complete, sites are often taken over by wildlife organisations

or local authorities to manage as nature reserves or public amenities. Many sites have subsequently been designated as Local Nature Reserves, National Nature Reserves such as Sandy Heath (inset opposite) in Bedfordshire or Sites of Special Scientific Interest. The industry also invests in field and education centres such as the Somerset Earth Science Centre developed by the Mendip Quarry Producers.

Besides the close working relationships that MPA member companies have nurtured on the ground, the MPA has formalised partnerships with some key conservation bodies. MPA has Memorandums of Understanding with the Bumblebee Conservation Trust and Freshwater Habitats Trust, helping to promote their work and support on-the-ground delivery through MPA member companies. Numerous other organisations also collaborate with MPA and its members including most of the 46 local Wildlife Trusts, the Bat Conservation Trust and Mammal Society.

MPA has a special relationship with RSPB who have taken the lead on the impressive Nature After Minerals (NAM) project. NAM is a partnership programme led by the RSPB with the support of Natural England and the minerals industry which advocates and advises on restoration for the benefit of wildlife.



The minerals industry, through its restoration work, is uniquely placed to help deliver against national and international biodiversity targets to directly help safeguard the future of all 960 priority species requiring immediate action and protection within UK government conservation plans.

Nature After Minerals





Quarries and mineral sites restored in favour of wildlife habitat can provide benefits for biodiversity/nature conservation because they provide a range of different habitats than surrounding agricultural or urban landscapes. The mosaic of habitats found on mineral sites both active and restored, offer excellent opportunities to provide habitat and foraging opportunities for many of the twenty-four species of bumblebee in the UK.

Gill Perkins
Chief Executive, Bumblebee Conservation Trust



Greater horseshoe bat | (Devon Wildlife Trust) Sourton Quarry, Devon
by John J Kaczanow

Back from the Brink

Among many ambitious conservation projects involving former mineral sites is 'Back from the Brink' led by a consortium of wildlife organisations. Its aim is to save 20 endangered species from extinction and benefit over 200 more through 19 projects that span the country. The restoration of quarries will contribute to the conservation and recovery of many of the habitats and species targeted by the initiative, particularly limestone grassland, heathland and deciduous woodland, that support species including grey long-eared bat and willow tit.

Flora, fauna and footy

Middleton Hall Quarry near Tamworth is a 470-hectare restoration in partnership with RSPB, Aston Villa Football Club and the Middleton Hall Trust. The diverse restoration includes a mix of football pitches alongside reedbeds, woodland, pasture and fishing. The quarry operator worked closely with all parties to create islands, gravel bars and other features to enhance the habitat value and help alleviate flooding in the wider area.



Sand martins on dredger winch wire
Nosterfield Quarry, North Yorkshire
by Chris Pennock

Sand-scapes for Sand Martins

Many sand and gravel sites attract sand martins that nest in exposed banks, with operators adjusting working practices to avoid damage or disturbance to these. Increasingly, companies are being proactive and creating banks specifically to accommodate these migrants, examples including Sandy Heath Quarry in Bedfordshire, Langford Lowfields in Nottinghamshire and Spynes Mere in Surrey.

Unlocking diversity

The diverse geology of the UK, which gives rise to an array of essential minerals and mineral products, creates an equally diverse range of opportunities for restoration, landscape enhancement and habitat creation.

The design of each scheme will reflect local circumstances, the type of mineral and nature of the working. For example, rock quarries producing minerals such as granite and limestone tend to operate for a much longer period, with deep excavations, than shallower sand and gravel sites. Industrial minerals may be worked on an ad hoc 'campaign' basis with different parts of a site being re-visited over time depending on the type of material and market demands.

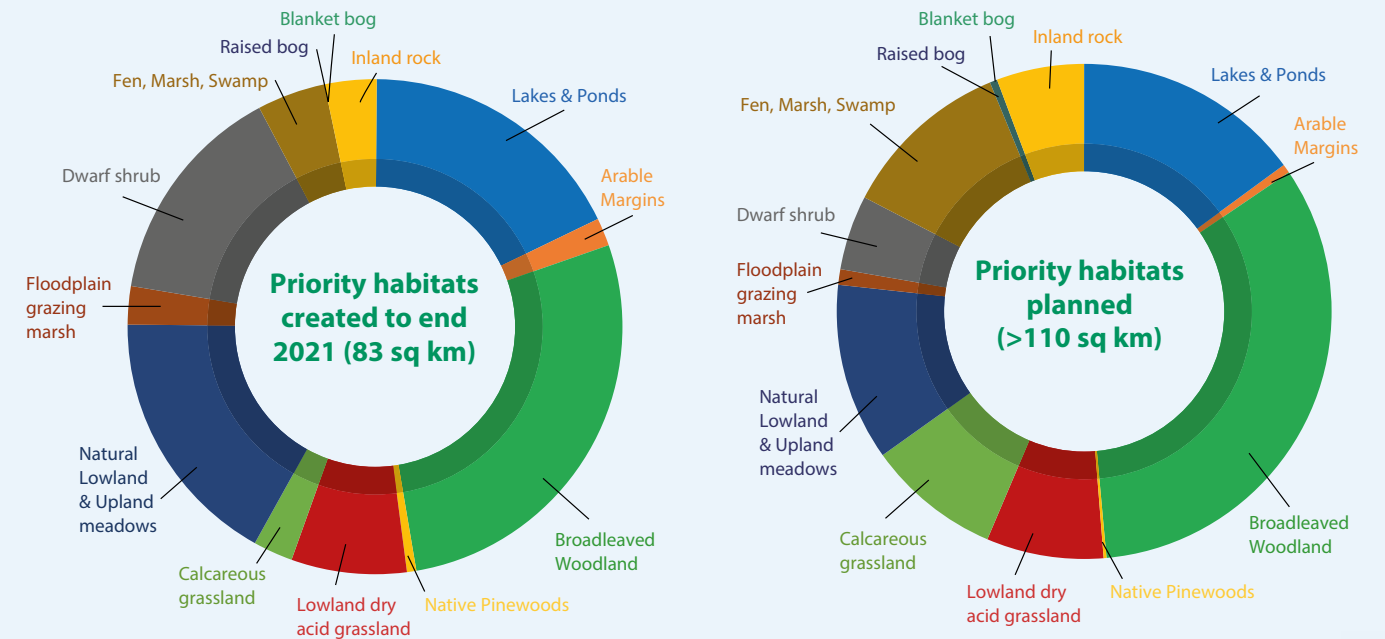
The diversity of outcomes for former mineral workings is no better exemplified than through the range of entries into

the MPA Restoration and Biodiversity Awards – an impressive biennial showcase of the best quarry rehabilitation and land stewardship schemes.

The right conditions – soils, hydrology, topography – and the availability of machinery, experience, knowledge and skills means that the industry can deliver imaginative and innovative restoration schemes to restore and enhance landscapes, and create new spaces for people and wildlife alike.

This publication outlines award-winning examples of quarry restoration to create habitats such as wetlands, grasslands, heathlands and woodlands. In reality, each restoration scheme delivers numerous complementary habitats, and many restoration schemes lend themselves not only to nature recovery but to a variety of sensitive after uses.

These charts show the diversity of UK Broad Priority Habitats already created through quarry restoration as well as those planned for the future.



Source: MPA members.



Protecting rare and vulnerable species

Rare and endangered species can be encouraged and provided for through minerals site restoration schemes.

Working in partnership with local authorities and conservation organisations, the industry has become adept at establishing new wetlands and reedbeds in river valleys, heathland and acid grassland on thin sandy soils, calcareous grassland and meadows on limestone, and many types of native woodland.

These in turn attract a diverse range of species – and restoration schemes are often designed with the needs of a particular species in mind.

For example, a high proportion of the UK's population of bittern are now thriving in reedbeds on restored minerals sites. Several species of bat, including greater and lesser horseshoe, and long-eared bats, benefit from mosaics of woodland and grassland created after quarrying. The bare, infertile 'scruffy' ground immediately after quarrying provides ideal habitat for many plants and invertebrates such as digger wasps, solitary bees and bumblebees. Ephemeral ponds also provide transitory habitats for specialists such as the fairy shrimp. And peregrine falcons are a common sight in restored and active rock quarries, with surveillance and security providing a safe haven for nesting.



Derbyshire

At Dove Holes Quarry in Derbyshire, twite (a small finch) were fitted with minute radio transmitters to track flight and identify and monitor nest sites. The twite has declined by 90% over the last 20 years, and the population at Dove Holes is the most southerly in the UK. The five pairs at Dove Holes represent 5% of the national population. The project, in partnership with the RSPB, British Trust for Ornithology and a local group, involved erection of radio masts inside and outside the quarry.

Photo: Tim Melling



Brown long-eared bat | (Devon Wildlife Trust) Sourton Quarry Nature Reserve, Devon | by John J Kaczanow

North of England

Peregrine falcons are a common feature of rock quarries. An MPA member won a special award for its work with the police to prevent the theft of peregrine falcon eggs and chicks and destruction of nests. This included installation of CCTV cameras, additional security patrols, an awareness campaign and urging employees and others to be vigilant for unusual and suspicious activity around the quarries.

Conwy

At Raynes Quarry near Conwy, North Wales, an MPA member has partnered with RSPB and Conwy Council to create new species-rich calcareous grassland using local hay. The team also worked with a local grazier to ensure the sheep were not treated with insecticide that may kill invertebrates in their dung – all of which has help conserve the chough (a species of crow with limited distribution in the UK – this being the most easterly population).

Glamorgan

In a project with Natural Resources Wales, the National Museum of Wales and Cardiff Council, operators of Taffs Well Quarry used old tunnels in the limestone to create 'bat caves' and hibernacula for a wide range of bat species including barbastelle, brandts, daubentons, whiskered, brown long-eared, great long-eared, greater and lesser horseshoe bats.





Wetlands

Restoration of mineral sites, particularly those in river valleys, is often done to create wetland habitats including lakes and ponds, reedbeds, wet grasslands and wet woodlands. These atmospheric landscapes support an abundance of wildlife, and also provide a range of other benefits including recreation, water management and flood control.

Quarries restored for nature conservation are a haven for wildlife, both terrestrial and aquatic. Gravel pit lakes and ponds often have excellent water quality, which is now rare in lowland landscapes. These clean water habitats are critical, supporting many of our declining and threatened freshwater species, such as pollution-sensitive lesser-bearded stonewort and variable damselfly. Quarry sites are a very important piece of the puzzle on our mission to create a rich, diverse and healthy freshwater landscape.

*Dr Jeremy Biggs
Director, Freshwater Habitats Trust*

Landscape-scale delivery

The River Trent and Tame valleys have long presented opportunity for landscape-scale delivery. The valleys were once a wildlife paradise – a giant wetland artery running 185 miles from source in the West Midlands to the sea in Lincolnshire.

Over the past 100 years or so wetlands were drained, built on or neglected but quarrying is reversing the decline. Carefully coordinated restoration of a whole string of quarry sites (see examples, right) is bringing this huge Midlands corridor back to its former glory, and in doing so securing the future of threatened species.

While small wetlands are of high value for species like amphibians and dragonflies, larger sites of 100 or even 200 hectares can accommodate a full range of species. They are also more resilient to the effects of climate change, and allow management at scale.

Staffordshire

Progressive restoration of Newbold Quarry south of Burton-on-Trent is a long-term project, with a new 160-hectare area well underway. Restoration of the site has already returned land to farming, woodland and wetland. The latest stage includes semi-improved grassland and arable land, together with new lakes for amenity, recreation and nature conservation. New planting will join up existing areas of woodland.

Restoration of Middleton Hall Quarry near Tamworth has seen a previously degraded farmland landscape transformed into a diversity of habitats. The operator worked closely with the Environment Agency on a scheme which involved experimental extraction from the river bank creating islands, gravel bars and other features which enhanced the habitat value. With some 23 hectares of reedbeds also created in the main gravel workings, now part of RSPB Middleton Lakes, the overall benefit has been massive. The restoration also helps to alleviate flooding in the wider area.



Nottinghamshire

At Langford Lowfields near Newark-on-Trent, a partnership with the RSPB has created a popular reserve. Still a working quarry, the site is on course to become the biggest reedbed in the East Midlands, with particular long-term potential for bittern, water vole and eel. Trails and viewpoints offer local people new opportunities to enjoy the rich landscape and to see some 20 butterfly species plus barn owl, cuckoo and hobby.

A strong long-term relationship with Nottinghamshire Wildlife Trust has seen Attenborough Quarry near Beeston evolve into a stunning 145-hectare nature reserve with an award-winning visitor centre. Its bird species include bittern, grasshopper warbler, great crested grebe, lapwing and oystercatcher. Attenborough is also strategically located to join up other initiatives which include plans to provide osprey nesting opportunities along the Trent Valley.



North Yorkshire

A restored sand and gravel quarry was opened as Ripon City Wetlands in 2019. Working with Yorkshire Wildlife Trust and the local community enabled the operator to create a diverse mixture of priority habitats. Green hay was spread across the site to form botanically rich fenland. Three thousand reed plugs were bought locally and planted to create an abundance of reedbed habitat while 280 metres of hedges were laid alongside the canal reedbed. An 11-hectare open water sailing lake features slipways, jetties and a boat park. The long-term future of the site is secured in an agreement with the land owners, Yorkshire Wildlife Trust and North Yorkshire County Council.

Buckinghamshire

The Floodplain Forest project at Milton Keynes, in partnership with the Parks Trust MK, was the winner of a biodiversity innovation award in 2019 for the restoration of sand and gravel workings to a mix of habitats including rivers, ponds, reedbeds, wet woodland and hedgerows. Critically, the site includes a dynamic river floodplain system created through engineering and landscaping of multiple braided channels and pools connected to the main River Great Ouse at different levels, so there is periodic inundation and flows depending on water levels at different times. The habitats attract a wide variety of birds as well as otter and water voles.



Morayshire

Cloddach, a former sand and gravel quarry covering 35 hectares on the River Lossie near Elgin in the north of Scotland, has been restored to a mosaic of lakes, wetland, wet woodland, and agriculture. Lake margins were shaped to create shallows, islands, land bridges and sloping beaches. The shores were seeded with a local wildflower mix and wetland plants and scrub have regenerated naturally.

Water flows through the site and the range of priority habitats that are now established provides a wildlife corridor, attracting otters and 95 recorded species of bird including the Slavonian grebe. The community engagement programme at the site is designed to educate local schoolchildren about mineral extraction and nature conservation.



The extraction industry is superbly placed to, and is already making, a significant contribution to UK and indeed global biodiversity targets and initiatives. By reason of its size and location the industry is delivering landscape-scale habitat creation providing that all important corridor and connectivity role. It has become a role model on what can be achieved in the environmental sector, which other wings of industry are now seeking to emulate. When you add in the industry's willingness to work in partnership with environmental bodies that contribution is further enhanced, and with the opportunity 'biodiversity net gain' offers we live in very exciting and positive times.

*Simon Elson
Principal Environmental Enhancement
Officer, Surrey County Council*





Northamptonshire

In the Upper Nene Valley one of Europe's newest Special Protection Areas for birds has been delivered through restoration of minerals sites. Quarrying has transformed what was once intensively farmed land into a 16-mile long string of managed wetlands. Although each has significant biodiversity credentials in its own right, it is the continuous wetland that yields massive benefits for nature. Irthlingborough is one quarry within this wider network of sites that not only acts as a flood plain protecting towns and villages along the valley but is also home to at least 150 species of birds. Recognised with SSSI status, the lakes feature spits and small islands are attractive to amphibians and dragonflies.



Oxfordshire

At Gill Mill Quarry in the Windrush Valley in West Oxfordshire restoration is underway to create a mosaic of habitats demonstrating how pressures and opportunities can be balanced to deliver outstanding results. The restoration scheme will deliver 61 hectares of reedbed and 66 hectares of other habitats. Amongst priority species operators hope to attract are bittern, barn owl, water vole, bats and otter. The project will also result in a further increase in public access to the lower Windrush Valley. The plans even include lakeside eco lodges to help fund management of the site and habitats in the long-term. Once complete, the restoration will deliver one of the largest areas of connected priority wildlife habitats in southern England.

County Tyrone

At Pomeroy sand and gravel quarry in Northern Ireland, a quarry operator joined forces with a local conservation group, Ballinderry River Enhancement Association, to conserve native white-clawed crayfish that were disappearing from the Ballinderry River and Lough Neagh Wetlands. White-clawed crayfish is the only species of the lobster family found in freshwaters in Ireland and is under threat from non-native farmed species which carry crayfish plague.

The scheme involved the creation of an innovative 'habitat bay' uniquely designed for a breeding and reintroduction of the crayfish. The quarry lake's naturally alkaline water provides perfect conditions for the crayfish to thrive.

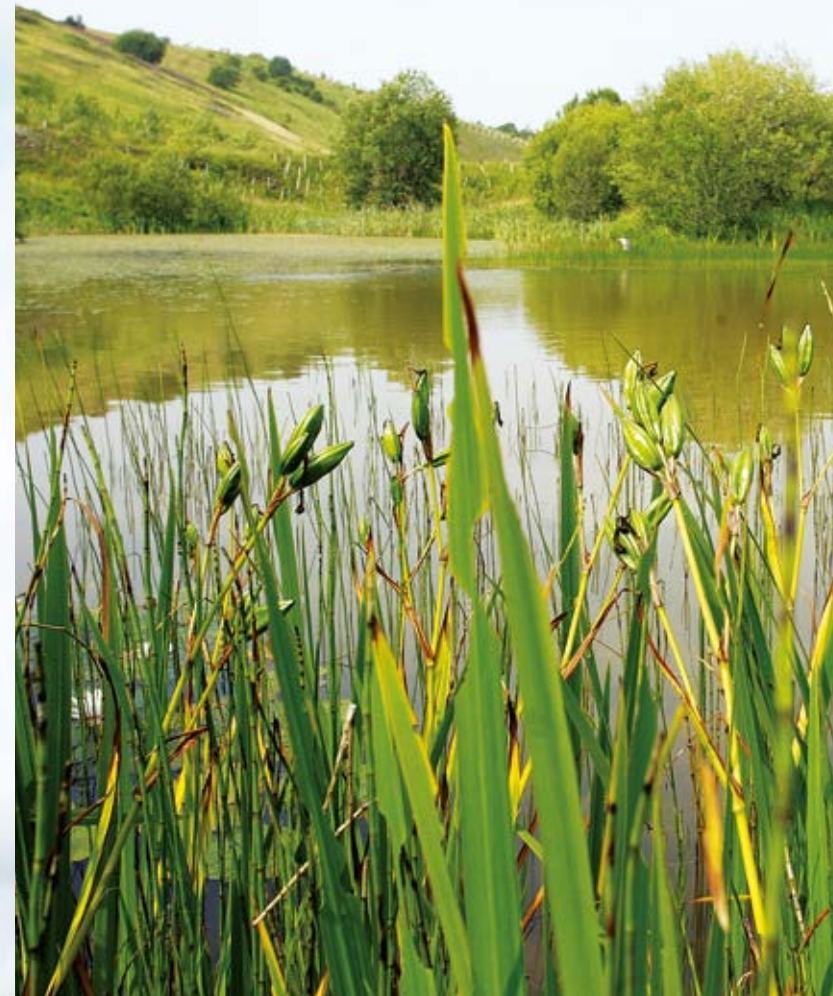


Heathland & Grassland

Heathlands and moorlands are some of the wildest landscapes in the UK, characterised by open areas of heather on nutrient-poor soils, hosting a range of specialist species. Species-rich grasslands (whether calcareous, acidic or neutral) are part of our natural heritage and are vital to biodiversity. When managed carefully they also act as huge carbon sinks. These habitats have been in decline so conserving and expanding them is a priority.

Quarrying has the ability to help to protect and enhance habitats and species through effective restoration and long-term aftercare. It provides significant opportunities for net gain and the provision of more sustainable habitats as well as climate change mitigation and adaptation. It is gratifying to see the wildlife legacy across the country from quarrying and we welcome the priority that the minerals industry takes with regards to enhancing habitats and species.

*Lisa Kirby-Hawkes
Development Planning Manager, Hampshire County Council, and Planning Officers' Society*



Derbyshire

One of the UK's major quarry companies operates a number of large limestone quarries in the Peak District including Tunstead, Ballidon and Dene quarries. Recognising the sensitivity of these location to their surroundings, the restoration schemes have been designed to deliver landforms that will sit harmoniously in the landscape (with particular reference to views from surrounding areas, including sensitive public vantage points). Scalpings and soils were used to roll-over and soften the benches and faces from extraction of versatile limestone. This created naturalistic rock formations such as buttresses and scree slopes, complemented by translocation restoration and management grazing of calcareous grassland, together with enhancement of surrounding woodland and connections to the Peak District National Park.

Shropshire

Bayston Hill Quarry produces up to a million tonnes of high quality stone each year. As part of a 30 million tonne extension, the operator created a large new bank on which 20 hectares of UK priority habitats have been established comprising lowland meadow, dry acid grassland, as well as rock and scree, and ponds. Grassland habitat creation has involved strewing of locally sourced hay and introduction of grazing, with deciduous woodland and parkland features. It connects to the surrounding landscape and the adjoining SSSI, and provides a corridor and stepping stones for grassland and wetland species. The scheme has involved close working with the local authority and, after only a short time, the bank is making a major contribution to Shropshire's biodiversity targets.







Hobby

Wood mouse

Pennyroyal

Sand lizard

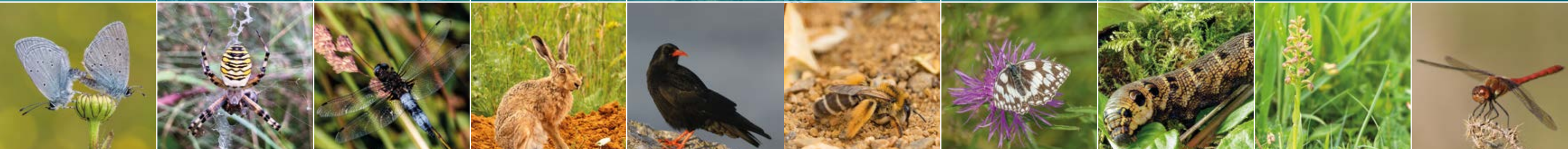
Nightjar

Nightingale

Common spotted orchid

Water vole

Fairy shrimp



Small blue butterfly

Wasp spider

Scarce chaser dragonfly

Brown hare

Chough

Pantaloan bee

Marbled white butterfly

Elephant hawk moth

Frog orchid

Ruddy darter dragonfly



Common lizard

Dormouse

Cheddar pink

Bearded tit

Chara stonewort

Sundew

50 species for 50 years

As part of the MPA's 50 years of quarries and nature celebrations, 50 species were identified that exemplified the breadth and diversity of wildlife that is known to flourish on restored quarries in the UK.



Bilberry bumblebee

Bittern

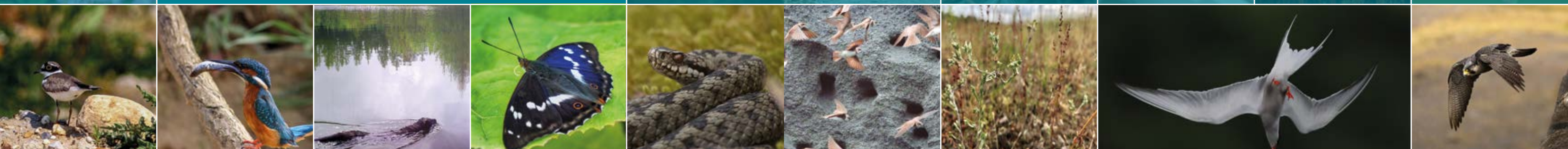
Avocet

Wall brown butterfly

White-clawed crayfish

Brown long-eared bat

Silver-studded blue butterfly



Little ringed plover

Kingfisher

Otter

Purple emperor butterfly

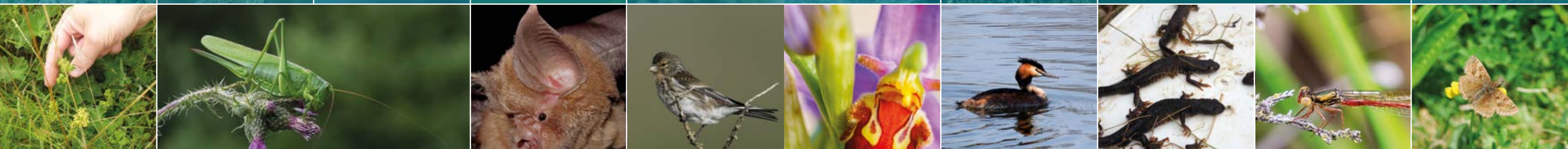
Adder

Sand martin

Small cudweed

Common tern

Peregrine falcon



Shining lady's mantle

Great green bush-cricket

Greater horseshoe bat

Twite

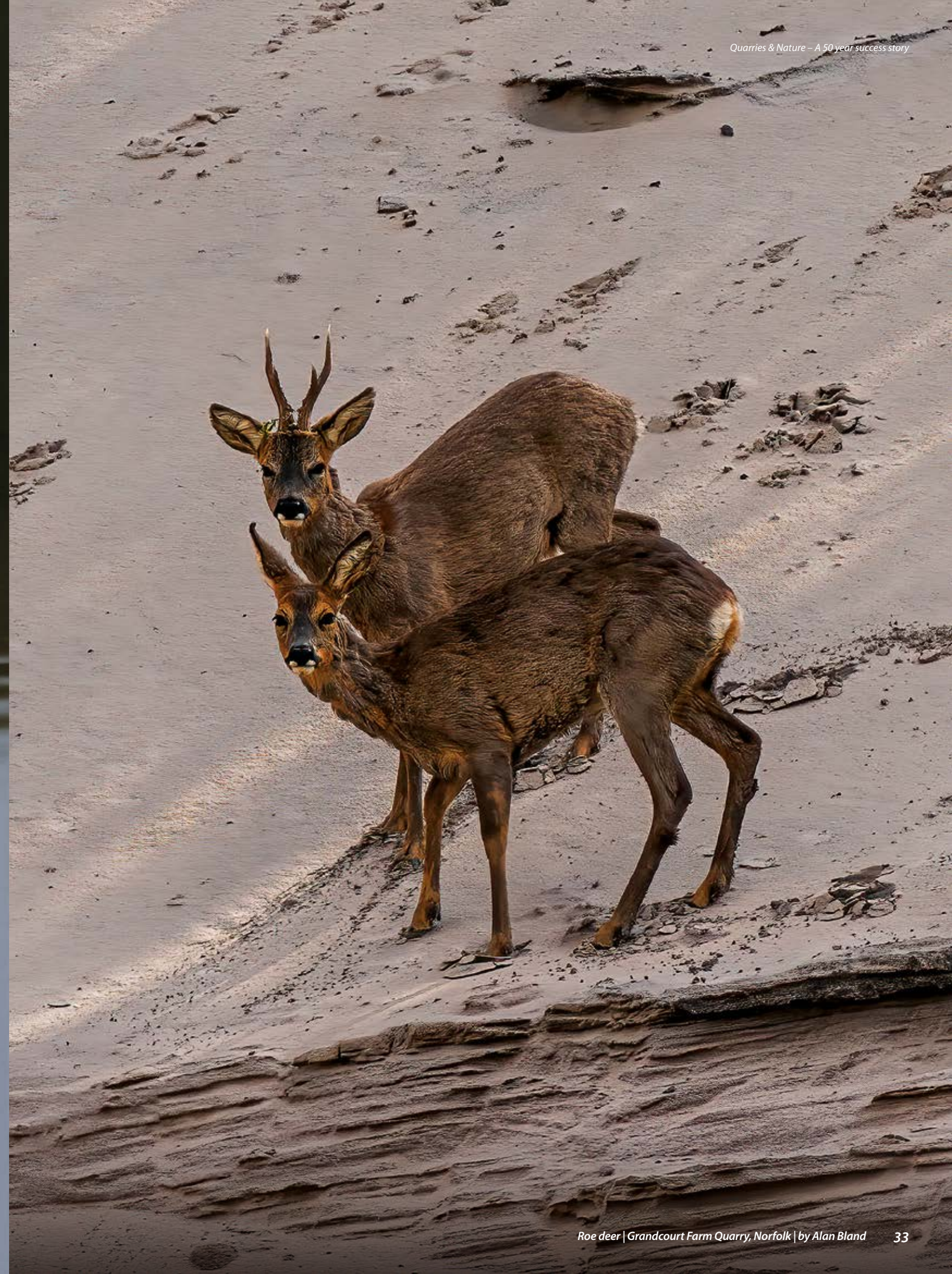
Bee orchid

Great crested grebe

Great crested newt

Small red damselfly

Dingy skipper butterfly



Devon

At Venn Ottery a 30-hectare sand and gravel quarry is in the early stages of restoration to lowland heathland with areas of woodland, meadows and ponds.

The site is in the East Devon Pebblebeds, one of the largest heathland areas remaining in the UK. It sits next to a heathland SSSI, SPA and SAC and is within the East Devon AONB so restoration has a key role to play in the wider landscape.

The work involves a close partnership with the RSPB which manages adjacent land, with heathland and meadow creation using a range of tried and tested techniques, plus specific features including an orchard and bat roost.

The site is also close to Blackhill Quarry, where 62 hectares of lowland heathland has been established using plant 'litter' from the surrounding SSSI and Natura 2000 designated land that surrounds the quarry.

Together these sites are already attracting key species including nightjar, Dartford warbler and woodlark, as well

as the small red damselfly, butterflies including grayling, small pearl-bordered fritillary and silver-studded blue, plus heathland flora including the carnivorous sundew.

The woodland and hedgerows support dormice and greater and lesser horseshoe bats. Together the landscape-scale benefits of these restorations are staggering.

It is encouraging to find that in 2020 at least eight species of bat were using the restored site at Venn Ottery in Devon. This site holds much promise for the future and as the semi-natural habitats, such as flower-rich grasslands and new hedgerows, mature over time it can be hoped that the use will increase further. This enriched habitat is set to become a vital stepping stone to support bats and a wide range of other biodiversity in the wider landscape.

*Carol Williams
Director of Conservation, Bat Conservation Trust*





Staffordshire

Rugeley Quarry lies within the Cannock Chase Special Area of Conservation, one of the most extensive stretches of lowland heathland in the Midlands. The quality of restoration is such that it is difficult to see what is former quarry and what is natural heathland. The operator worked alongside RSPB on the scheme, which is held up as the very best practice in heathland restoration. The site is making a significant contribution to Staffordshire's Local Biodiversity Action Plan Targets. Bird species found at the site include woodlark, nightjar and tree pipit. Rare palmate and great crested newts inhabit the restored heathland and there are 41 species of mining bees and wasps, which bury into exposed sand around the site.



Flintshire

Careful management of limestone grassland at Cefn Mawr Quarry near Wrexham has improved the habitat and is recognised by Natural Resources Wales as one of only a handful of sites of its kind in the whole of Wales.

Since 2009 a scrub removal programme has been in place, and the prevention of invasive species means that in the last 15 years the grassland area has increased by 38 per cent.

The site falls within a Site of Special Scientific Interest and Special Area of Conservation. The recovered grassland habitat is managed as part of the SSSI and ongoing work will encourage the regrowth to the standards of the remainder of the SSSI. Cefn Mawr Quarry is also home to the spring sandwort, a delicate plant with white flowers which is listed as nationally scarce.



Cornwall

A wide area of Cornish china clay mining near St Austell is recreating 785 hectares of lowland heathland over 26 square miles of the county. The work has been undertaken over a number of years as part of the Tomorrow's Heathland Project. It began with the landscaping and reprofiling of existing china clay tips, pits and mica dams in order to recreate previously lost lowland habitat. Heathland plant species were seeded onto specific sites, complemented by the planting of native trees. Collected seed stock was dispersed using a hydro-seeding technique. The project was planned using data from the National Lowland Heathland Programme and used historic material including aerial photography and landscape appraisals.





Woodland

The UK is one of the least wooded areas in Europe. Conserving existing woodlands and creating new ones provides valuable habitats for a range of species, as well as enhancing landscapes. Woodlands are widely recognised as being key to carbon storage as well as being important for recreation and water management.



Somerset

Torr rock quarry in the Mendips includes in its 250 hectares no fewer than four designated local wildlife sites plus it has part of an SSSI and Special Area of Conservation within its boundaries. Recognising that lowland mixed deciduous woodland is a priority habitat in this part of the country, the operator planted tens of thousands of new trees and continues to actively manage them through coppicing, together with translocated and newly planted hedgerows. The site team has also been particularly successful in establishing calcareous grassland on landscaping around the quarry with a total of 10 hectares to be created.

Warwickshire

Having extracted over a million tonnes of sand and gravel, progressive restoration at Bubbenhall Wood Quarry has established 11 hectares of native broadleaved woodland, 8 hectares of flower-rich grassland and 3 hectares of ponds, scrapes and wetland. The site lies right at the heart of the Princethorpe Woodlands living landscape area and restoration forms a key element of the vital habitat linkage to re-connect the existing fragmented ancient woodland habitats. The restored site provides a wooded link between Bubbenhall Wood and Ryton Wood SSSI, through a permeable landscape that will eventually develop into a true closed canopy woodland. Warwickshire Wildlife Trust has taken the site over ensuring its long-term future management for biodiversity objectives.





Hertfordshire

Panshanger Park in Hertfordshire is a Grade II* listed historic landscape where sand and gravel extraction commenced in 1992. Following extraction of 5.5 million tonnes of mineral the restoration progressively returned the site to woodland, agriculture, meadows and wetland, including enhancement of the chalk river providing habitat for water voles and otters. The famous Panshanger Oak (right) is the largest maiden, or clear-stemmed oak in the country and is believed to have been planted by Queen Elizabeth I. As quarrying operations come to an end, it is hoped that a large part of the estate can be opened to the public as a country park and nature reserve with management steered by a Management Committee including the local Wildlife Trust, county council and Environment Agency.



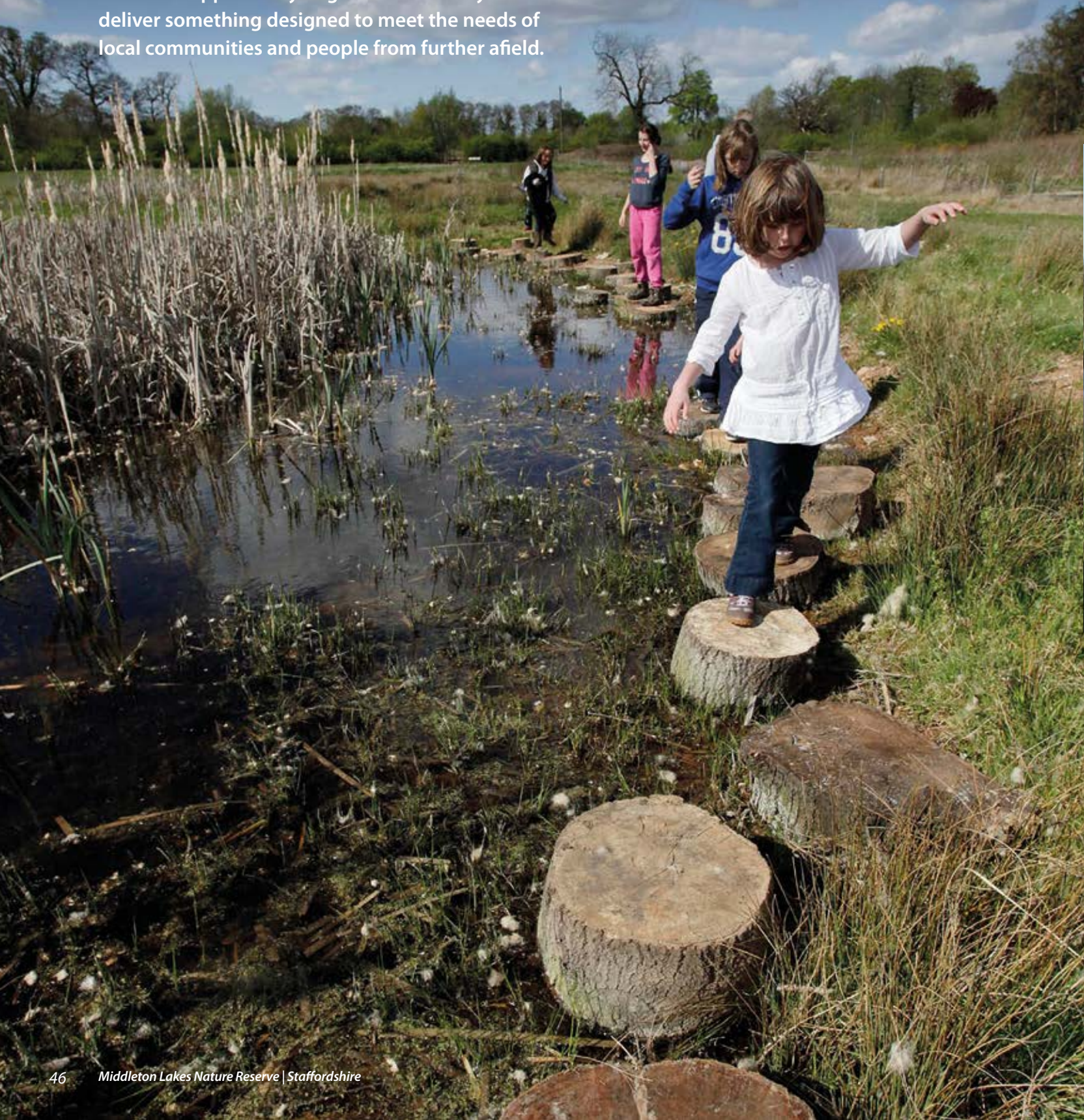
Somerset

At Batts Combe hard rock quarry in Somerset, restoration has been informed by over 40 years of working the site and collaboration with both Bath Spa University and University of West of England. This is delivering landscape enhancement and biodiversity benefits through re-vegetating the benches, including through planting of rare species including cheddar pink flowers and whitebeam trees, as well as establishment of woodland, calcareous grassland and scree to benefit a range of species including the dormouse.



Going beyond

Nature recovery remains the priority for the vast majority of quarry restoration plans. But sometimes there's an opportunity to go above and beyond to deliver something designed to meet the needs of local communities and people from further afield.



Gloucestershire & Wiltshire

The Cotswold Water Park comprises 150 lakes spread over more than 100 sq km, all there because of sand and gravel extraction and sensitive, progressive restoration. Across that area – quarried by a number of MPA member companies – there are 18 distinct nature reserves with some lakes dedicated to leisure and water sports. Sitting astride the border between Wiltshire and Gloucestershire, the water park is also a place for people. More than 22,000 live here, and many more come for leisure and for holidays. The importance of the park has been recognised through its designation as a Site of Special Scientific Interest (SSSI) and it is important that future extraction can occur side-by-side with wildlife conservation.



North Yorkshire

A partnership approach was a key part of a restoration scheme at Ripon Quarry in North Yorkshire. The operator's 'In at the Start' initiative was designed to engage the local community in helping to shape a creative restoration scheme that fitted with its surroundings. Key stakeholders included members of the High Batts Nature Reserve which adjoins the site and local schoolchildren who assisted in monitoring wildlife both within and around the quarry (where volunteers also carry out habitat management work). Monitoring helped to inform decisions about the type of restoration to be created and how the site will be managed in future years, as well as educating people about the variety of species on their doorstep.



Kent

Workhouse Quarry, near Maidstone has been restored primarily to high grade agricultural land. The company involved didn't work the aggregates but it did handle the restoration and its sister company now farms the land. The site was filled with inert construction waste that could not be recycled. Today, the completed landform includes a wildlife corridor with hedgerows linking two older woodlands, and there's also a drainage pond as another valuable habitat.





Staffordshire

The outstanding restoration of Alrewas sand and gravel quarry formed the National Memorial Arboretum (see aerial view, right). The project has created a historic, peaceful place of national, international and personal significance for visitors, where the Armed Forces Memorial commemorates servicemen killed on duty since 1948. The wooded parkland, lakes, ponds, riverine habitat, grassland, reedbeds and wetland also provide a broad range of habitats.



North Yorkshire

At Pateley Bridge in the Nidderdale AONB, quarry restoration includes the walk-through Coldstones Cut sculpture that celebrates not just the beauty of the area but its long association with quarrying. It is the crowning glory of a massive 92-hectare landscaping schemes created by moving over two million cubic metres of soil. The operator also relocated large areas of high value grassland and created a series of ponds and a marsh area for amphibians.



Gloucestershire

Part of the former Barnhill Quarry in Chipping Sodbury, Gloucestershire was transformed into a new area of town. The southern end of the site, which once housed the aggregate processing and asphalt plants, now features a supermarket and a retirement home. And to the north, more than 70 homes were built on a section of the former extraction site. After laying dormant for decades, in 2001 an initial blueprint for a residential and commercial development was drawn up. Work began in 2009 and today this former brownfield site close to the town centre is a peaceful area for people to live and shop.





MPA Restoration Awards - Cooper-Heyman Cup winners

A legacy of outstanding achievement

Since 1971 the mineral products industry has recognised the most successful quarry restoration schemes. In 1982 a new trophy was awarded for the first time in recognition of the most exceptional restoration achievements among the entries.

The Cooper-Heyman Cup was given to the former Sand and Gravel Association (one of the trade organisations which predates the MPA) by Mrs Isobel Cooper-Heyman in memory of her late husband Mr Ernest Cooper-Heyman.

Cooper, as he preferred to be known, was chairman of Midlands-based quarry operator Slabcrete whose Windmill Quarry in Staffordshire was a winner in the first awards of 1971.

The solid silver cup, made in 1896, is ornamented with flora and fauna and engraved with the fitting words "Do paint the meadows with delight", a line from Shakespeare's Love's Labours Lost.

Here are all the worthy winners of that prestigious premier award in quarry restoration which has served as focus for the industry to continually raise standards as well as providing a lasting legacy to the pioneers of quarry restoration.

- 1982** St Albans Sand and Gravel
- 1983** Henry Streeter (Sand and Ballast)
- 1984** Greenham Construction Materials
- 1985** St Albans Sand and Gravel
- 1986** St Albans Sand and Gravel

- 1987** Greenham Construction Materials
- 1988** Hall Aggregates
- 1989** Atlas Aggregates
- 1990** Moreton C Cullimore (Gravels) and St Albans Sand and Gravel
- 1991** Ryton Gravel Company
- 1992** Ickham Gravel
- 1993** Brett Group & Hall Aggregates
- 1994** Hepworth Minerals and Chemicals & Northern Aggregates
- 1996** Hall Aggregates
- 1997** Tarmac Limited & Duchy of Lancaster
- 1998** Hanson Aggregates
- 1999** RMC Aggregates
- 2001** Lafarge Aggregates
- 2002** Alresford Sand & Ballast Company
- 2003** Tarmac
- 2004** Brett Group & Ministry of Defence
- 2005** Brett Group
- 2006** CEMEX
- 2007** Bardon Aggregates
- 2008** Hanson Aggregates
- 2009** Lafarge Aggregates & National Memorial Arboretum
- 2011** Tarmac & Nottinghamshire Wildlife Trust
- 2013** Lafarge Tarmac
- 2015** Hanson Aggregates
- 2017** Tarmac
- 2019** Aggregate Industries & Tarmac

MPA Biodiversity Award winners

Year	Company	Award Category
2011	CEMEX (Rugeley) Brian Butterfield	Winner MPA Special Award (awarded posthumously)
	Brett Group, Marshalls plc, Sibelco UK Ltd, Smith & Sons (Bletchington) Ltd	MPA Special Award
2013	Hanson (Upper Nene Valley) Lafarge Tarmac with Shropshire Council (Bayston Hill)	Winner – Landscape-scale Runner-up – Landscape-scale
	Smith & Sons (Bletchington) Ltd with ESP (Ardley North) Phil Harding (Brett Group)	Winner – Innovation Winner – Butterfield Trophy for Individual Contribution
2015	Hanson & Aggregate Industries (Batts Combe & Callow Rock)	Winner – Landscape-scale
	CEMEX with RSPB (conservation of twite and turtle dove)	Winner – Innovation
	Smith & Sons (Bletchington) Ltd (Gill Mill) Chris Pennock (Tarmac)	Winner – Planned Winner – Butterfield Trophy for Individual Contribution
	Anthony Allday (Tarmac) Hills Group, Hanson UK, Cullimore Group, Aggregate Industries, Tarmac Tarmac	MPA Special Award MPA Special Award MPA Special Award
2017	Imerys Minerals Ltd (Cornwall China Clay) Aggregate Industries with RSPB (Blackhill)	Winner – Landscape-scale Runner-up – Landscape-scale
	Hanson (Keepersshield) Raymond Brown (Brickworth)	Winner – Innovation Winner – Planned
	Michael Cardus (Tarmac) Marshalls plc	Winner – Butterfield Trophy for Individual Contribution MPA Special Award
2019	Aggregate Industries with RSPB (Venn Ottery) Imerys Minerals with Devon Wildlife Trust (Meeth)	Winner – Landscape-scale Runner-up – Landscape-scale
	Hanson, The Parks Trust, Milton Keynes (Floodplain Forest)	Winner – Innovation
	CEMEX with Northumberland Wildlife Trust (Divethill) Brian Beales (CEMEX)	Winner – Planned Joint Winner – Butterfield Trophy for Individual Contribution
	Dave Helliard & Alan Knight (Aggregate Industries) Vaughan Gray (Tarmac)	Joint Winner – Butterfield Trophy for Individual Contribution Joint Winner – Butterfield Trophy for Individual Contribution
	Martin Crowe (Hanson) Martin Layer (Smith & Sons (Bletchington) Ltd)	MPA Special Award – Individual Contribution MPA Special Award – Individual Contribution
	Mary Lane (Sibelco) John Vine (Imerys Minerals Ltd)	MPA Special Award – Individual Contribution MPA Special Award – Individual Contribution
	Tarmac and Cranfield University	MPA Special Award
	Natural England has sponsored and assisted the judging of the biodiversity awards, focusing on the Landscape-scale category	



Looking ahead

While the examples highlighted throughout this document demonstrate excellent approaches and outcomes, the industry is determined to keep evolving and innovating, responding to new challenges and opportunities.

The industry's unique ability to create new areas for nature to thrive takes on a whole new perspective with the introduction of the Government's Environment Bill which – amongst other things – means all new developments in England will have to deliver an overall increase – a 'net gain' – in biodiversity. This is nothing new for companies involved with mineral extraction. Quarries are uniquely placed and delivering for nature recovery and an overall gain in biodiversity. And because quarrying typically takes place on agricultural land with relatively low biodiversity, the breadth and scale of what can be created during and after the land is worked for minerals is incomparable to any other type of development.

Many restoration schemes, and management of active quarries, reflect wider landscape-scale opportunities, and there's more to do to maximise benefits, for example through a more dynamic and flexible approach to habitat management and succession, which may not be helped by

a numbers-based approach that will be required by mandatory biodiversity net gain.

Restoration schemes also clearly deliver much larger benefits than just biodiversity – including creation of new landscapes, opening up areas for access, recreation and enjoyment, and wider 'natural capital' and its associated 'ecosystem services' including those necessary to address and respond to climate change such as carbon sequestration, water storage and flood management.

Minerals are part of our natural capital, extracted and used to benefit society. While not 'renewable' they last a very long time through their use in buildings, infrastructure, and a vast array of products, and most can be and are re-used and recycled time and again. The UK is a world leader in the recycling of construction and demolition waste and what is not used as recycled material is used to recycle the land. As long as minerals are needed by society, mineral producers will continue to go above and beyond to ensure that the lasting legacy of their work is a positive one. The industry looks forward to another 50 years of high-quality restoration schemes, where minerals operators continually adapt to new challenges and opportunities, and where their critical role is properly recognised.





“The partnership between the RSPB and the minerals industry is incredibly important for wildlife. There’s a real opportunity to do something really quite significant for lots of species, lots of habitats, but also very importantly, for people as well, providing recreational space surrounded by nature. It’s one of the very few industries that have made really, really strong efforts to create something out of what they’ve exploited. By planning and working with the stakeholders, the RSPB, other wildlife organizations, communities, the planning authorities, we can create better spaces for nature.”

*Nigel Symes
Head of Sector Advice RSPB,
and Nature After Minerals*

MPA Biodiversity Strategy

MPA members will continue to take a positive approach to nature conservation and recovery, leaving behind more and better quality habitats than before mineral extraction (net gain) through sensitive site selection, management, restoration and aftercare.

MPA and its members will:

- Protect and enhance biodiversity through land and site management and restoration, including wherever possible, delivering a net gain in biodiversity.
- Extend our knowledge of the wildlife interest and potential on and adjacent to active sites, and how best to maximise benefits through management, restoration and after-use, through monitoring and sharing of experience.
- Share best practice between our members and partners through regular events, briefings, and through our Biodiversity & Nature Conservation working group.
- Develop our partnerships with conservation organisations, decision makers and individuals to ensure that opportunities to improve biodiversity associated with minerals operations are understood and realised.
- Celebrate our successes through our Quarries & Nature Awards, collating and publicising achievements.
- Understand our contribution to delivery of local, national and international biodiversity priorities, through measuring and reporting the gains that we are achieving and planning to deliver.
- Increase our influence through engagement with policy makers at all levels, including with global initiatives and in association with European Trade bodies.
- Promote awareness and participation using industry assets such as restored sites and education centres to encourage visitors and out-of-classroom learning, to encourage first-hand experiences of the natural environment and our role in its conservation.

About the industry

Mineral products are essential to our construction and manufacturing industries, to our economy and to our everyday lives. The 390 million tonnes of minerals and mineral products produced in the UK each year comprise the biggest material flow in the economy.

The UK's diverse geology provides us with high-quality materials and supports a wide range of habitats and species. Maintaining a secure and adequate supply of materials, while reducing environmental impact and maximising environmental benefits is central to delivering sustainable development.

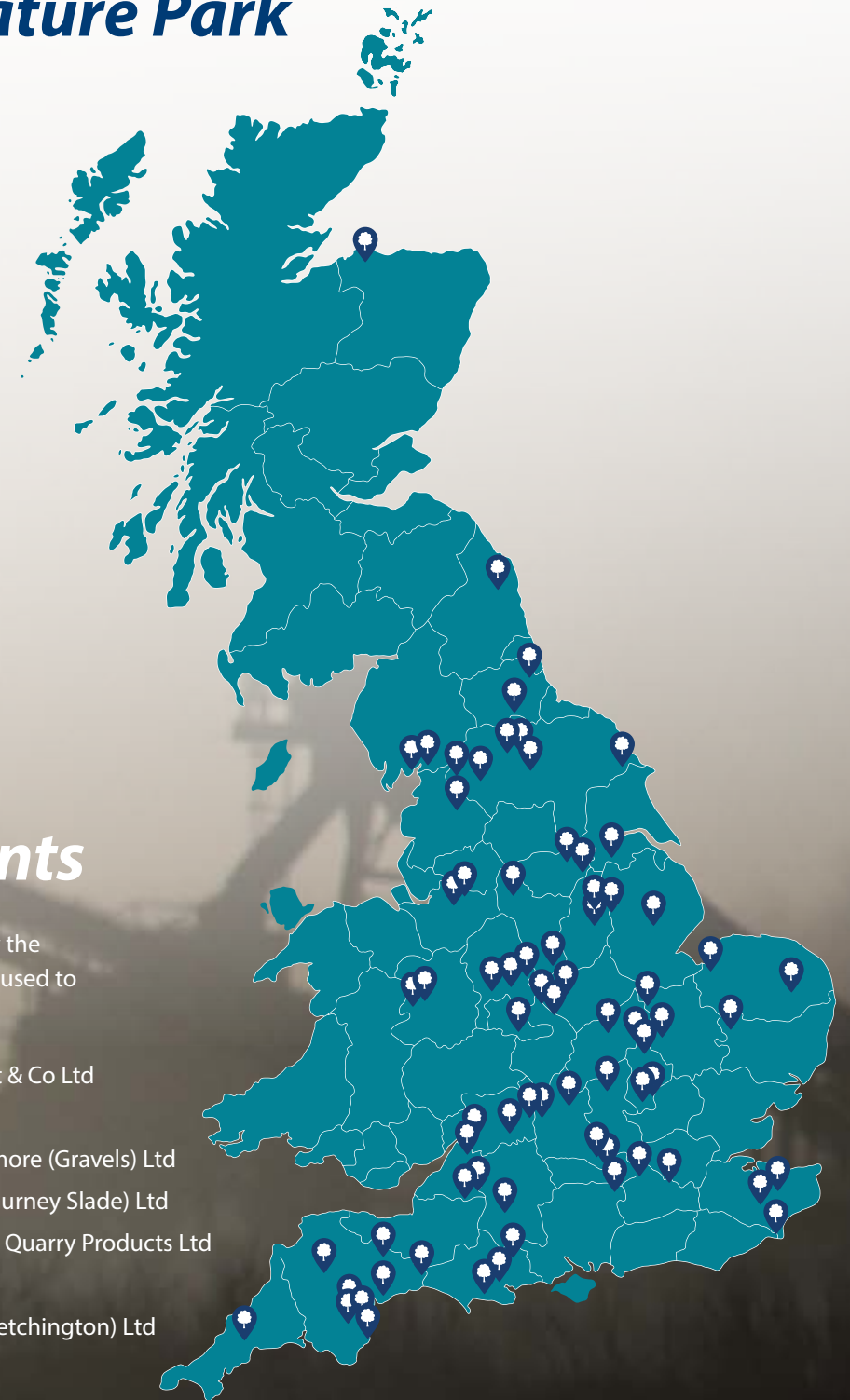
About the MPA

The Mineral Products Association is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries. MPA has a growing membership of 520 companies from small independent businesses to large international operators.

The industry supplies around £16 billion worth of materials and services to the UK economy every year. Mineral products industry production represents the largest materials flow in the UK economy and is also one of the largest manufacturing sectors.

MPA National Nature Park

The MPA National Nature Park is a growing network of nature reserves spanning the length and breadth of the country which have been created through quarry restoration. Most are managed by conservation organisations and have public access and many have grown to become regional destinations for wildlife watching.



MPA Restoration Guarantee Fund

MPA members are proud of their record on restoration. They know that unless worked out sites are not only left safe and tidy but also carefully designed to maximise their value to local communities, landowners and the wider environment, the industry can never claim to be truly sustainable. The MPA Restoration Guarantee Fund (MPARGF) recognises that it could be difficult for restoration conditions to be delivered if an operator becomes financially insolvent. First established by the Sand and Gravel Association in 1975, the MPARGF has evolved to provide a £1 million overall guarantee against restoration default with a single claim limit of £500k. It is endorsed by Government through the Planning Practice Guidance that supports the National Planning Policy Framework.

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CEMEX UK	Raymond Brown Quarry Products Ltd
Gallagher Group Ltd	Sibelco UK
Hanson UK	Smith & Sons (Bletchington) Ltd
Hills Quarry Products Ltd	Tarmac
Imerys Minerals	

Thank you to all the many industry employees and volunteers at restored sites who entered the MPA Nature Photo Competition 2021 and in previous years. Many of their images are included in this document.



The Mineral Products Association is the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries.

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Back cover: Short-eared owl | Totternhoe Knolls Nature Reserve, Bedfordshire | by Roy McDonald

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