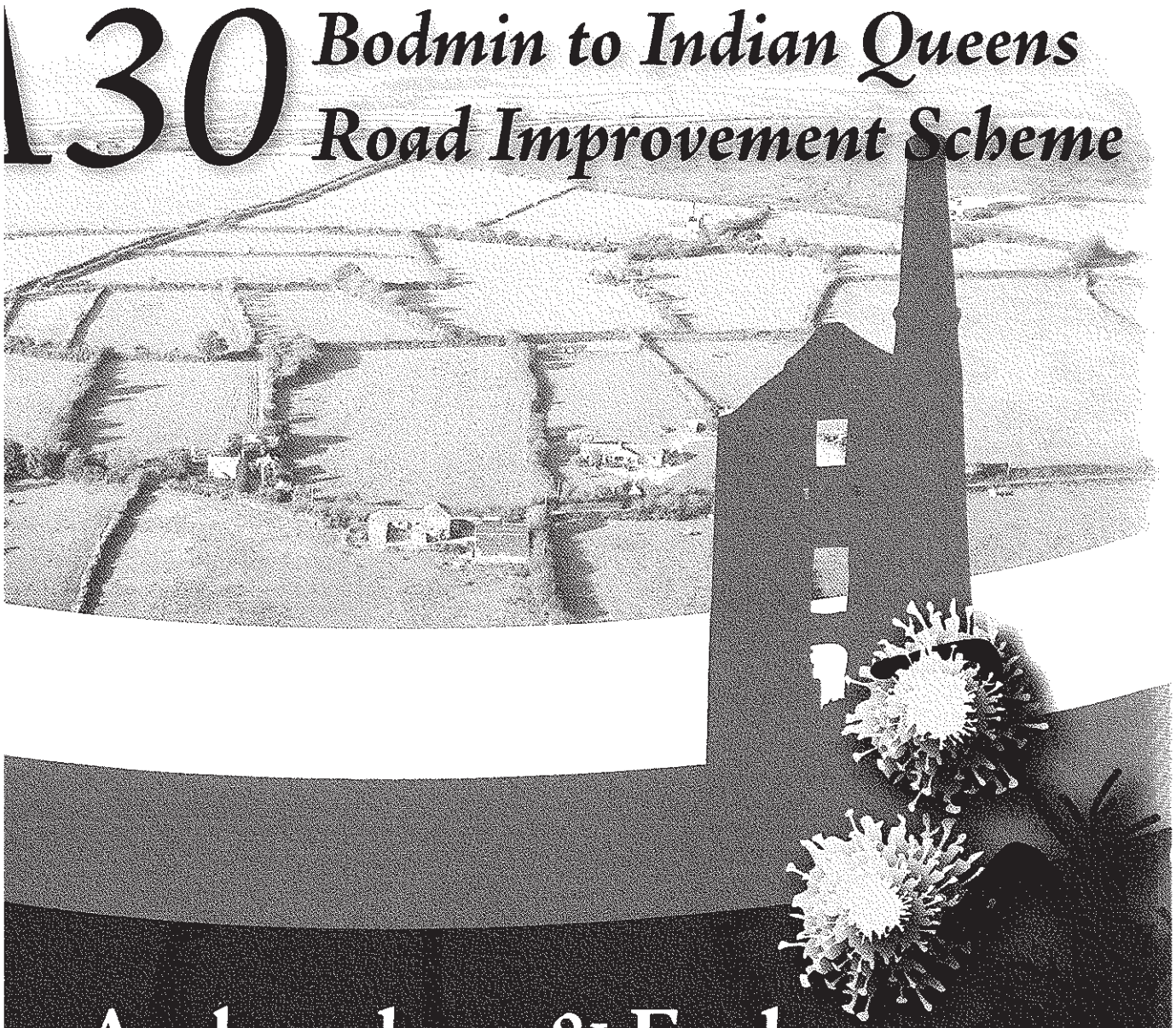
A30 Bodmin to Indian Queens Road Improvement Scheme



Archaeology & Ecology

July 2007

le A30 Bodmin to Indian Queens Road Scheme

The A30 trunk road runs the length of Cornwall, linking Penzance with Exeter in Devon. The Bodmin to Indian Queens section has formed a bottleneck on the route for many years. The road was a single carriageway and became notorious for accidents caused by the low head-room 'Iron Bridge' on Goss Moor.

In 2002 the Highways Agency appointed Alfred McAlpine and their designer Scott Wilson to design and construct the necessary road improvements. The team has now finished building 11.5km of new dual carriageway, nine bridges, 6.5km of side road, as well as extensive landscaping and environmental works. Through the lifetime of the project, Mouchel Parkman and RPS have provided Highways Agency with expert advice. The 'Early Contractor Involvement' scheme has enabled the team to adopt a strong partnering approach, dealing with archaeological and ecological matters in a positive and proactive manner.

Plans for the new road have been under consideration since the 1970s. However, the need for an improvement has grown dramatically over the last 10 years. Daily traffic has increased by 73%, leading to increased congestion and traffic delays, particularly in the holiday periods. Design work on the £93 million road scheme began in earnest in 2002. Our aim was to reduce congestion, improve reliability and road safety, while respecting the environment.

The road scheme had to be built through some importan areas for wildlife, including a National Nature Reserve at Goss and Tregoss Moors, which is protected under British and European law. We have taken this as an opportunity to improve the local environment.

. England have praised the scheme ...

ud to have worked with the Highways Agency to broker a ion which is truly win-win-win: delivering economic, social mental benefits.

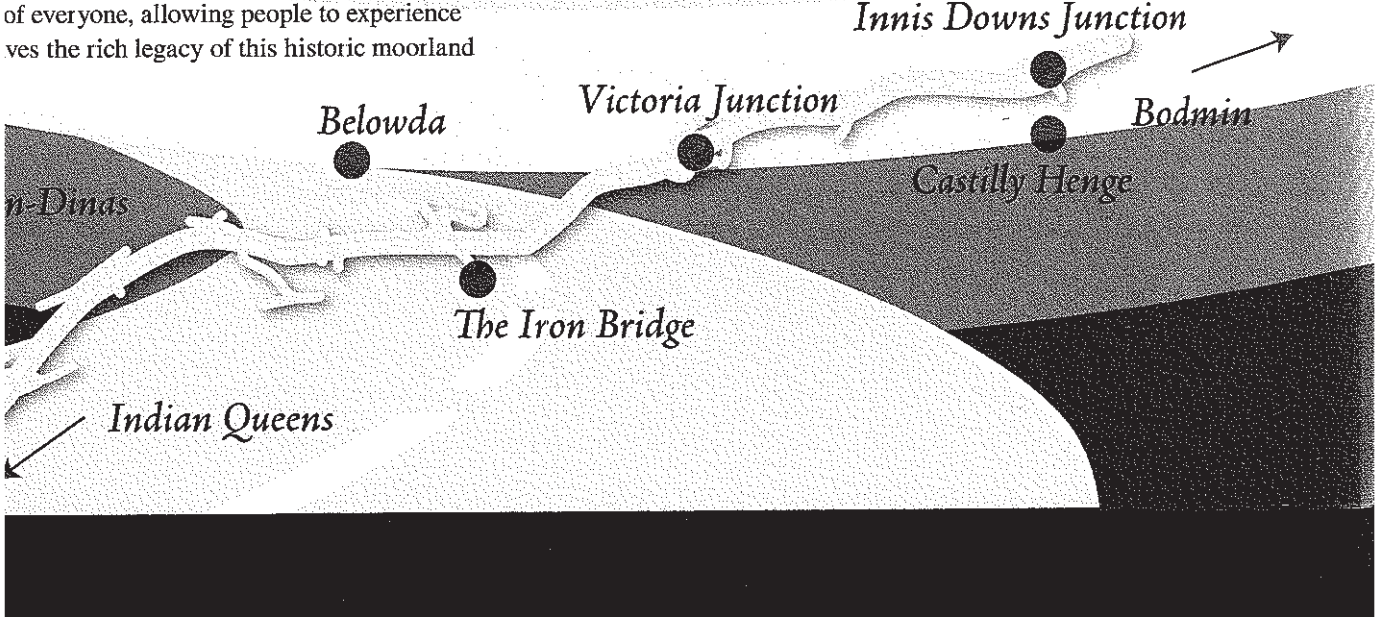
es like the marsh fritillary butterfly, in sharp decline with slicing its habitat in two, will benefit directly and the area a peaceful oasis for walkers, cyclists and horse riders.

Agency investments have also attracted more money from et up the mid Cornwall Moors LIFE Project to reconnect moorland landscape once again."

:onsidered at the Public Inquiry made it
r us to re-create a link between Goss and
ɔors, while also satisfying the needs of
Our aim has been to ensure the long-term
the plants and animals that live alongside
ıte, which include rare species in danger of
such as the Marsh Fritillary butterfly.

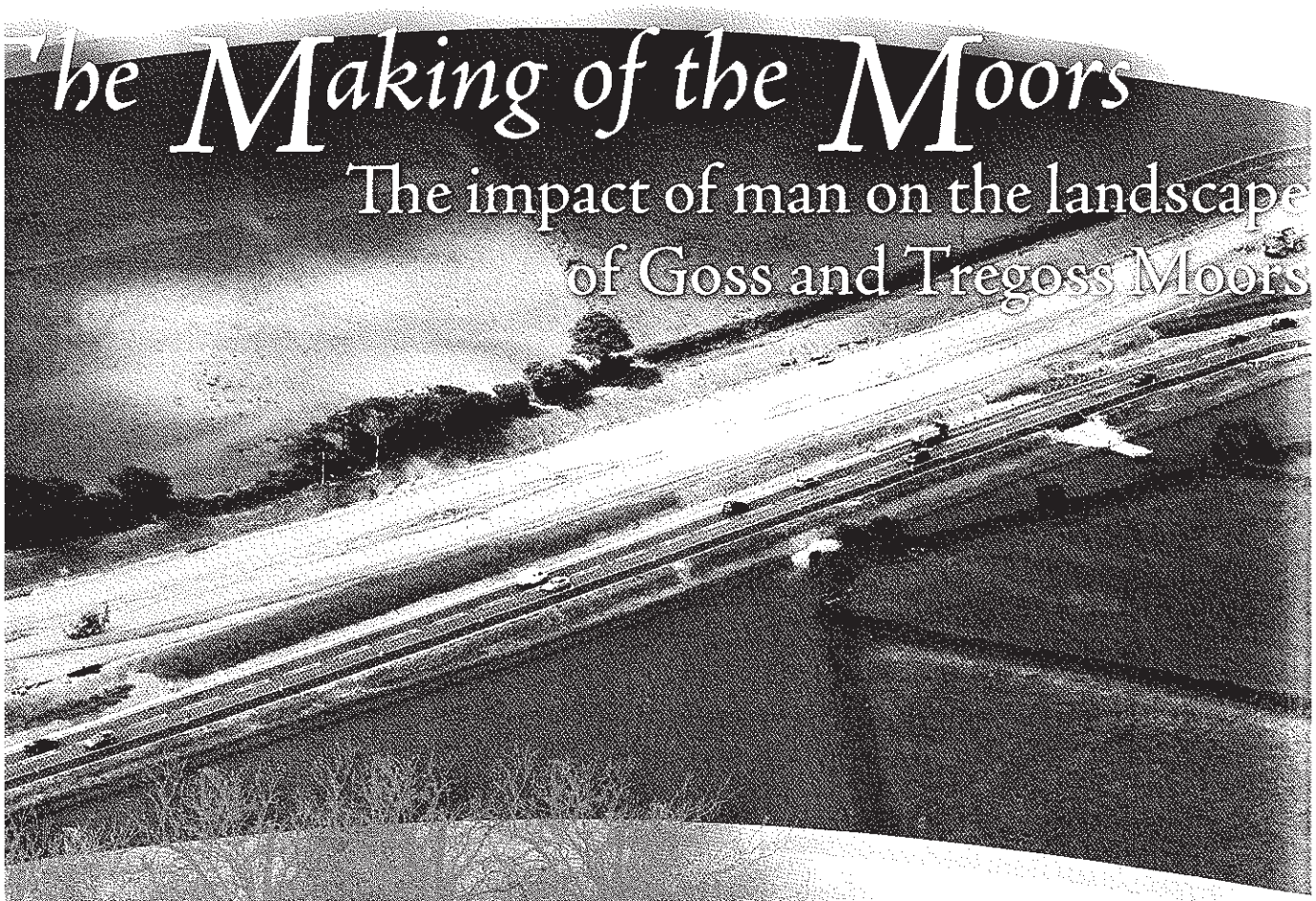
:tive character and ecology of the modern
ıas been shaped as much by thousands
human activity as by natural processes.
earthwork monuments, fossilised medieval
and the overgrown traces of old tin-
:an all be seen alongside the road. The new
ıefully designed to avoid damaging known
numents, but its construction was also an
y to make new discoveries. A team from
:haeology carried out large scale
ɔns which will help to build up a picture of
and environmental change in Cornwall over
00 years - a venture that would not have been
thout the construction of the new road.

ıd across Goss Moor has been reduced to a
which will open up the countryside for the
of everyone, allowing people to experience
ves the rich legacy of this historic moorland



The Making of the Moors

The impact of man on the landscape of Goss and Tregoss Moors



Goss Moor today is
for rare moorland wildlife
t scientific analysis of pollen
in waterlogged conditions in
tream channels has shown
te change and unsustainable
activity are not new problems
and areas of Cornwall: As the
e ended, around 9,500 BC,
tundra conditions gave way
d, which spread over much of
Much later, about 3000 BC,
farmers began to clear the woodland to make way for agriculture. By the early Bronze Age (about 1800 BC) there were extensive settlements on Bodmin Moor and Dartmoor.

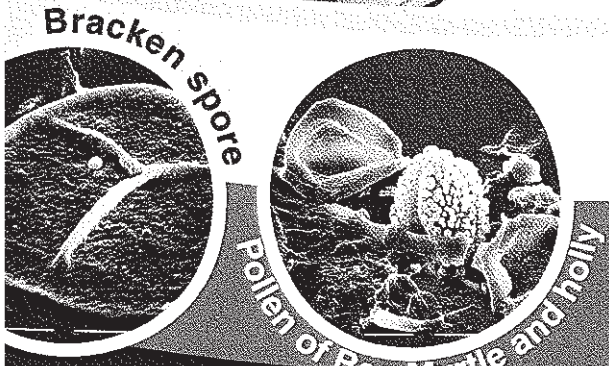
In the late Bronze Age (about 1000 BC) the climate became cooler and wetter, making the uplands less attractive for settlement. At the same time, the thin soil was eroded and exhausted as prehistoric farmers brought ever larger areas into cultivation.

These developments, and wider changes in society, led to permanent settlements on Dartmoor and Bodmin Moor being abandoned by the end of the Bronze Age. The A30 excavations suggest a similar pattern on Goss Moor and the surrounding area, although we did find evidence for short-lived or seasonal settlement in the Late Iron Age and Roman periods (about 200 BC - AD 100).

Thereafter the landscape of Goss Moor became damp, open moorland which, by around AD 1300, was used as pasture, and as a source of tin ore and also peat for fuel.

The area around Belowda and Tregoss seems to have remained quite attractive for settlement, as permanent hamlets were established by the early medieval period (about AD 1000 - 1350) surrounded by isolated pockets of open arable strip fields. The pattern of these ancient strip fields was preserved when they were converted into pasture in the late medieval period (about AD 1350 - 1600). They were enclosed with Cornish hedges, which have survived to the present day, providing cover and habitats for wild animals such as dormice and adders.

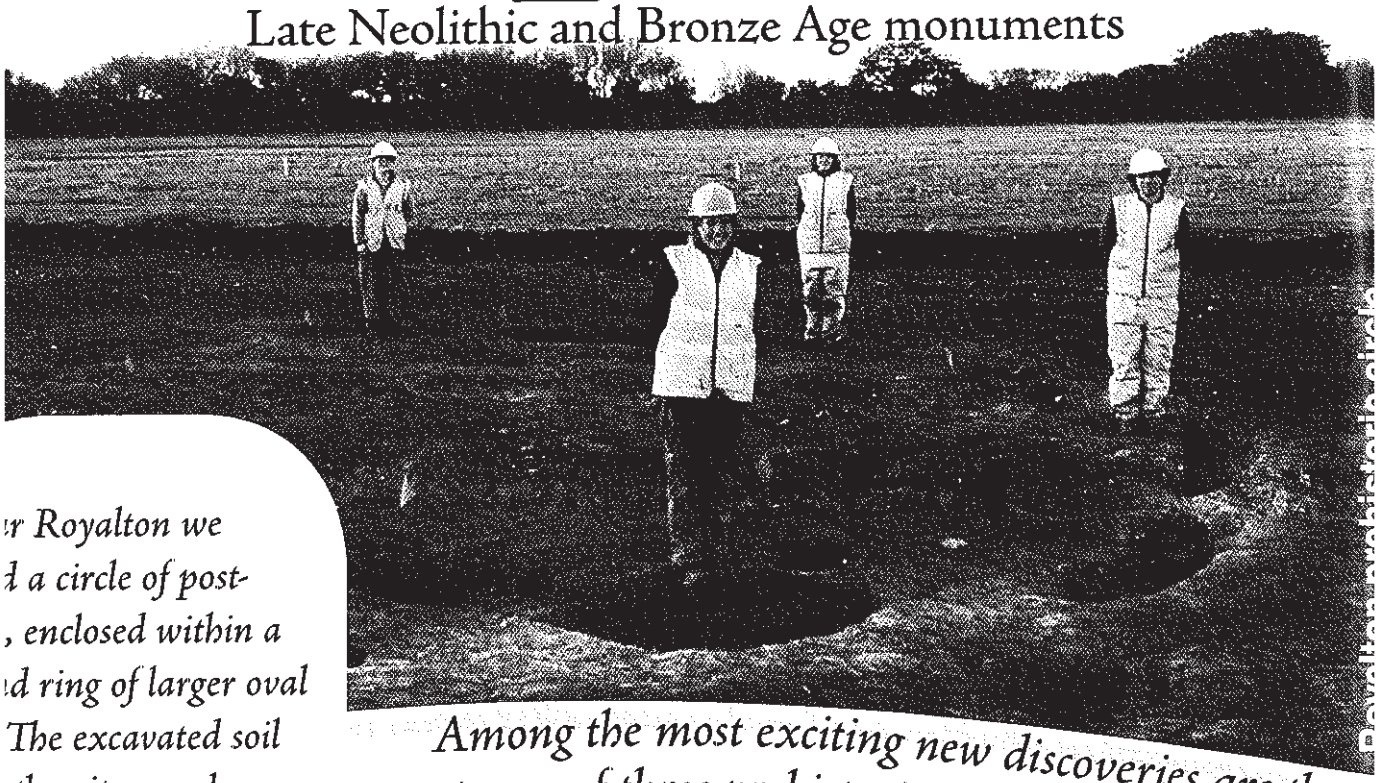
Rich natural deposits of 'stream tin' on Goss Moor certainly attracted settlers to the area from the 12th century onwards, and may have done so in earlier periods, allowing people to supplement a meagre living from farming by panning or streaming for tin. During the Industrial Revolution, from the late 1700s, the extraction of surface deposits of 'stream tin' and deep mining both became big business. The tin-workings once formed dramatic scars on the landscape, but today the overgrown spoil heaps and settling ponds alongside the old A30 are ideal habitats for a wide range of plant and animal species, particularly reptiles



In the early 1800s, large expanses of moorland were enclosed by landlords to provide small-holdings for a growing population of miners and agricultural workers. Many of these farmsteads were abandoned by the late 19th century, following the decline of the Cornish tin industry and some of the fields have returned to rough pasture.

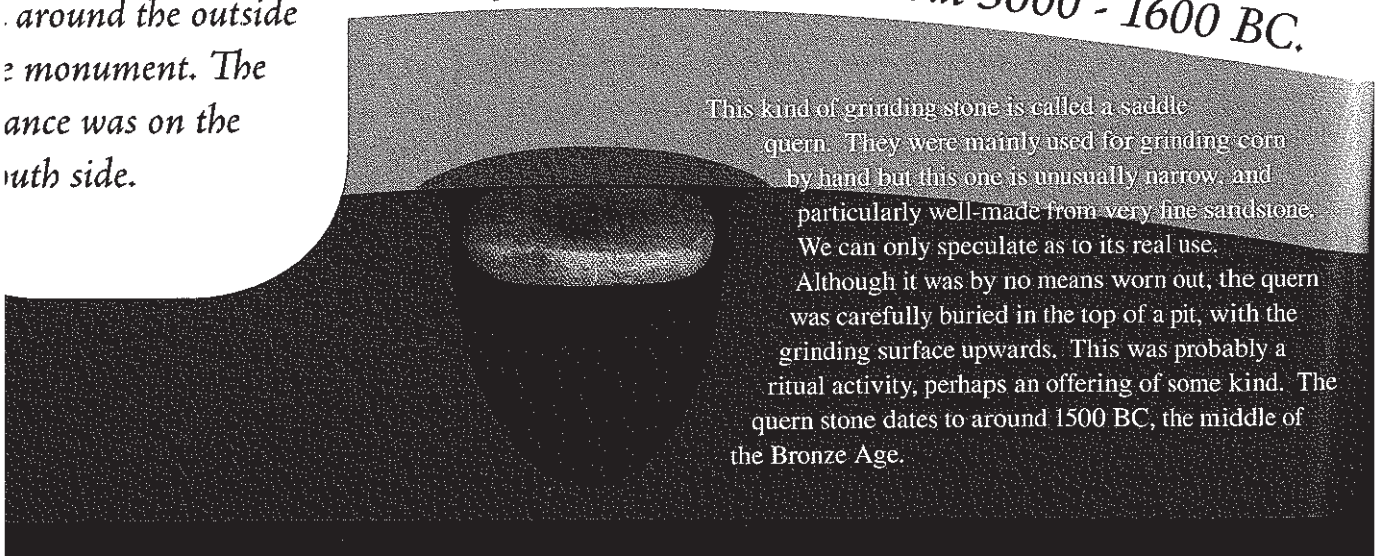
Circles in the Landscape

Late Neolithic and Bronze Age monuments



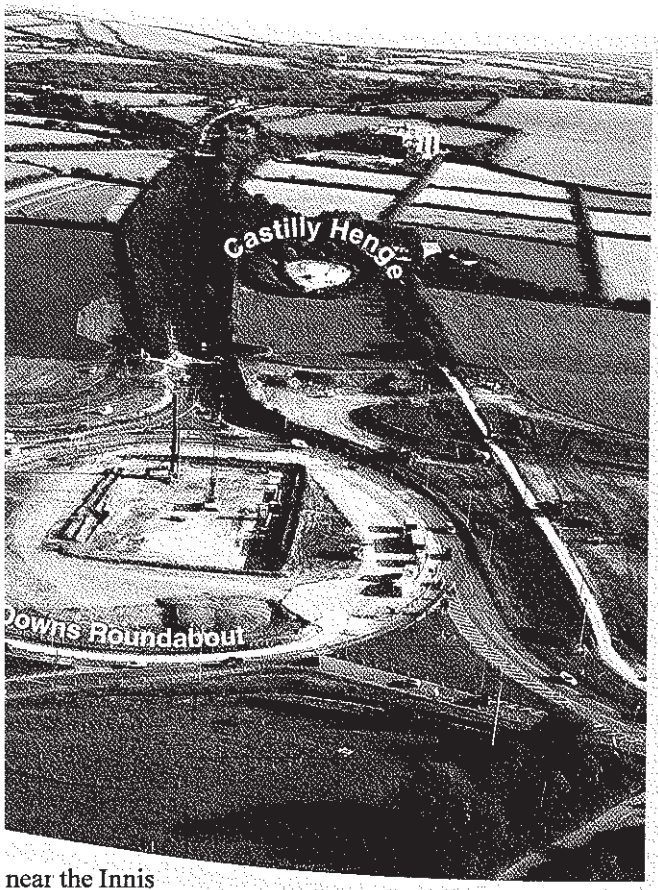
Among the most exciting new discoveries are the traces of three prehistoric circular monuments, used for ritual purposes about 3000 - 1600 BC.

r Royalton we d a circle of post- , enclosed within a d ring of larger oval The excavated soil the pits may have used to form a low around the outside e monument. The ance was on the uth side.



This kind of grinding stone is called a saddle quern. They were mainly used for grinding corn by hand but this one is unusually narrow, and particularly well-made from very fine sandstone. We can only speculate as to its real use.

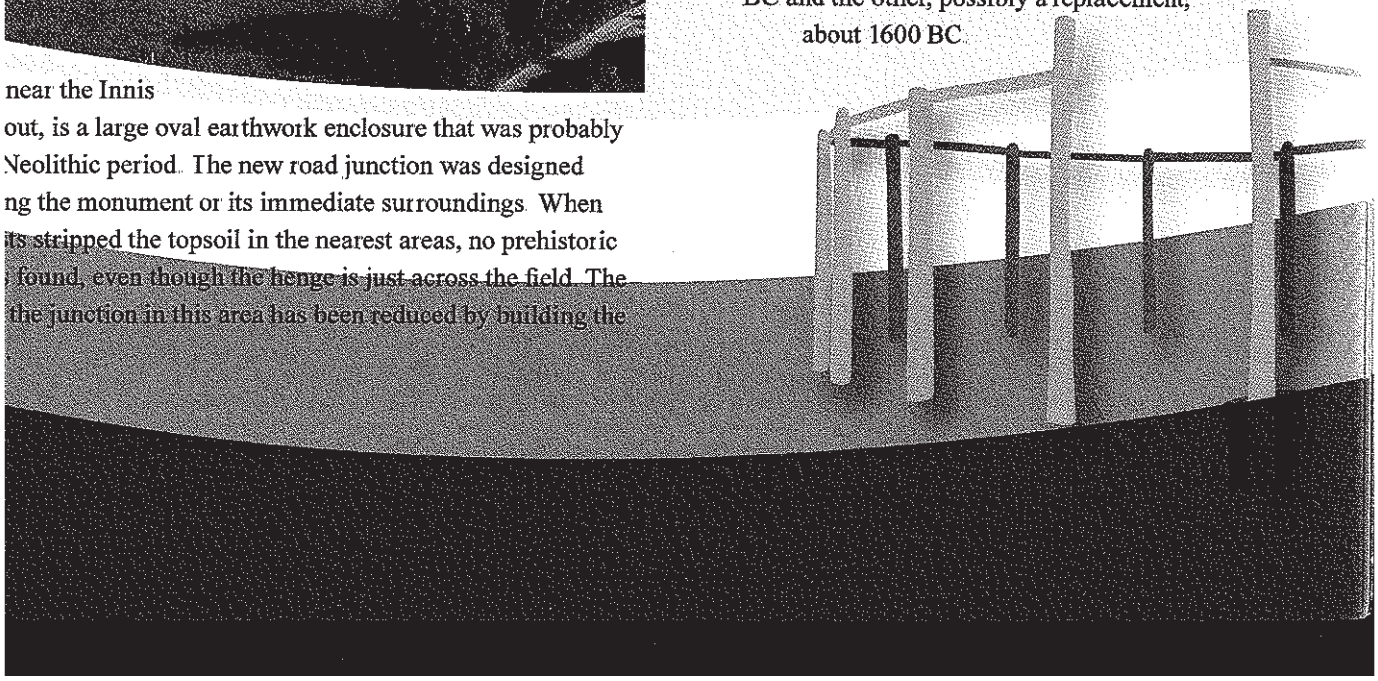
Although it was by no means worn out, the quern was carefully buried in the top of a pit, with the grinding surface upwards. This was probably a ritual activity, perhaps an offering of some kind. The quern stone dates to around 1500 BC, the middle of the Bronze Age.



The early farming communities of Britain built such monuments during the Neolithic and early Bronze Age. They vary greatly in size - Stonehenge is the most famous example. The Royalton circle is much smaller by comparison. Some were simple circular or oval enclosures, usually with one or two entrances, and an earth bank around the outside. Others, like the Royalton circle, enclose settings of timber posts or stones.

The purpose of these monuments is still a mystery, although it is generally accepted that they were used as arenas for ceremonial gatherings and rituals, including animal and (rarely) human sacrifice. Some sites also served as cemeteries for human cremation burials. Prehistoric timber circles are sometimes found on their own. Our archaeologists found two circles of pits, again for supporting upright timbers, at Belowda. We have radiocarbon dated the circles to the early Bronze Age - one was built about 1800 BC and the other, possibly a replacement, about 1600 BC.

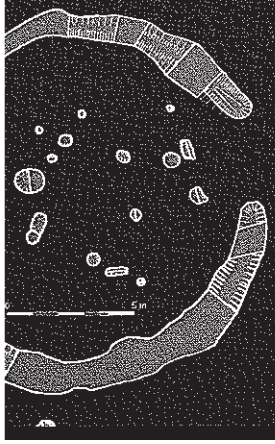
near the Innis
out, is a large oval earthwork enclosure that was probably
Neolithic period. The new road junction was designed
ng the monument or its immediate surroundings. When
its stripped the topsoil in the nearest areas, no prehistoric
found, even though the henge is just across the field. The
the junction in this area has been reduced by building the

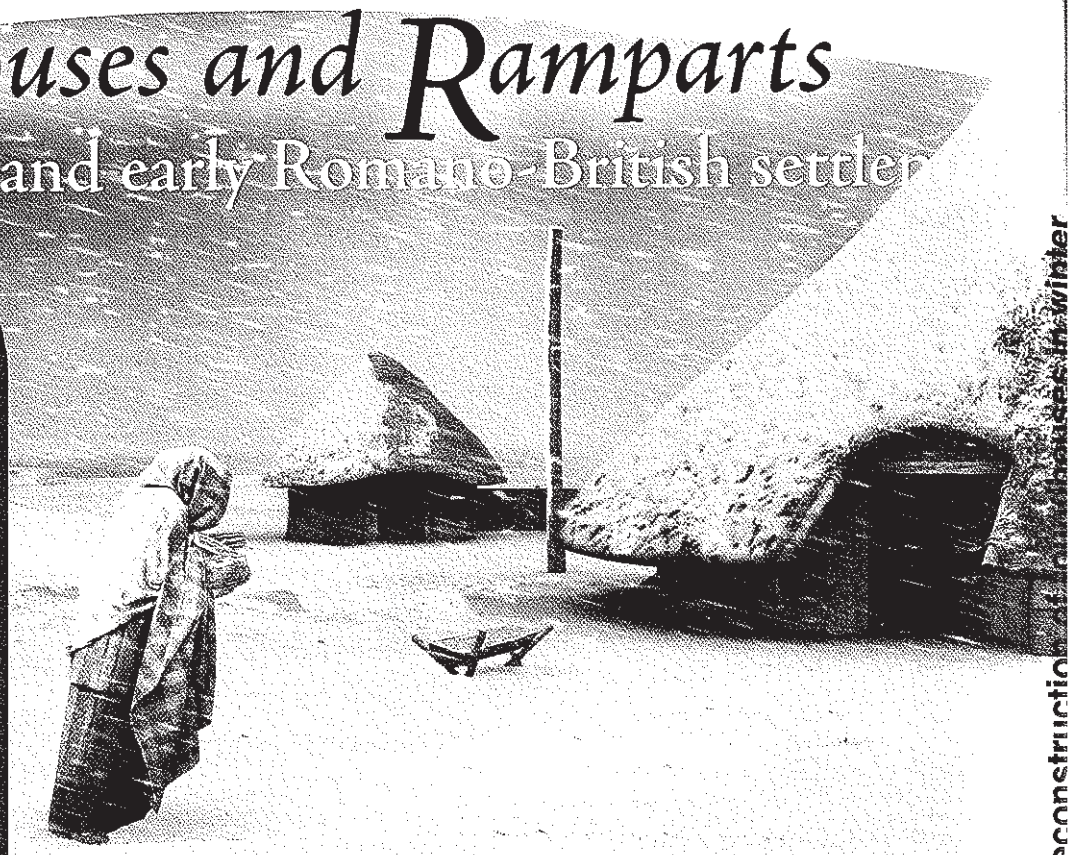


oundhouses and Ramparts

Iron Age and early Romano-British settler

und the remains of
dhouses, about 800m
he Belowda area. The
these sites, and the
n dates, show that the
e lived in during the
Age and early Roman
250 BC - AD 100).
s they were probably
t the same time as
Castle-an-Dinas.
oth roundhouses were
in diameter, and they
y stone walls with an
doorway. The roofs
e been made of thatch.
agments of heather
were found, both of
suitable for thatching.
ch house was a gully to
-water from the eaves.





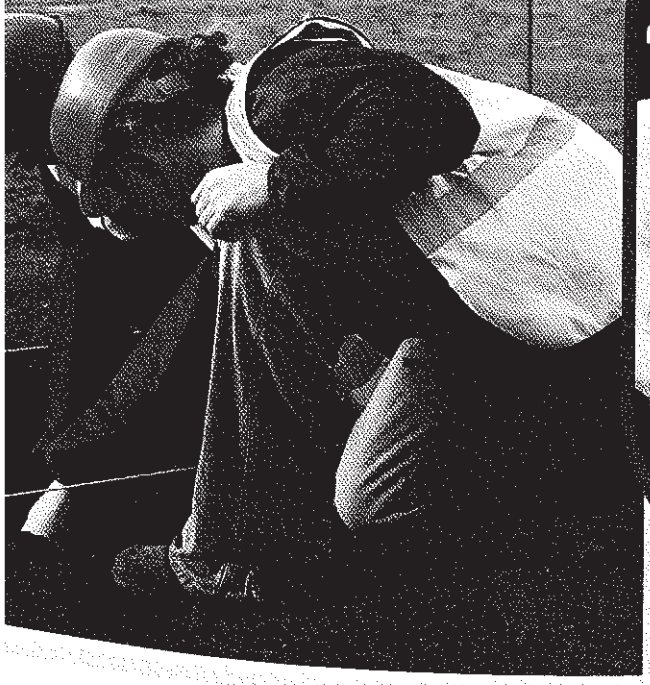
Reconstruction of roundhouses in winter

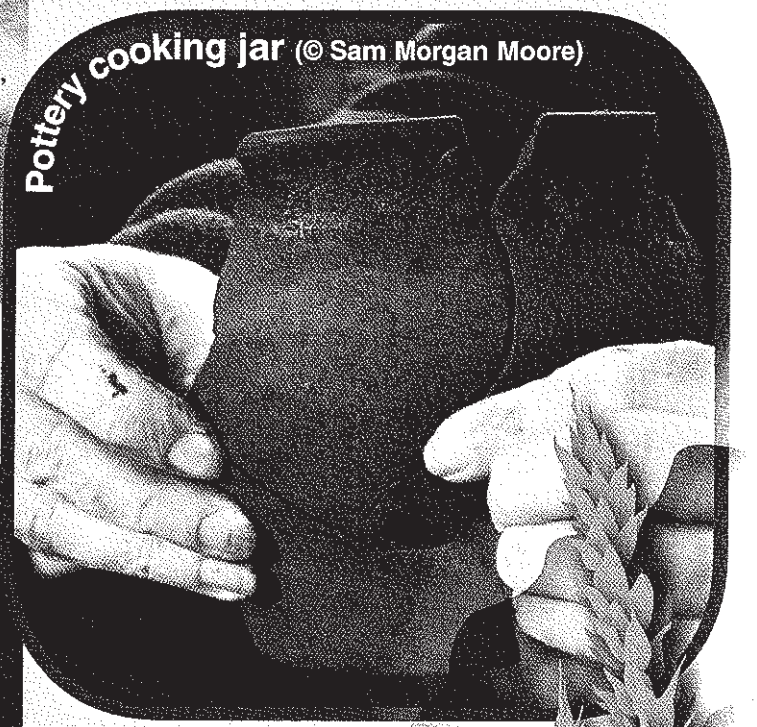
The A30 route across Goss Moor is overlooked by the hillfort of Castle-an-Dinas. The form and scale of the fort tell us that it was probably built in the Iron Age, perhaps about 300-200 BC.

Castle-an-Dinas (© Dae Sasitorn/www.bestrafts.co.uk)

In local folklore Castle-an-Dinas hillfort is associated with tales of the mythical King Arthur; it was reputedly the place from which he rode out to hunt on Tregoss Moor.

chaeology Foundation Course students worked on
dhouses during a training dig organised by the A30
group of 12 students were taking part in a one-week
m hosted by our professional archaeologists from Oxford
ds from the excavations included pottery cooking jars and
charred grain. This suggests that the houses were lived in,
time. They may have been used as seasonal dwellings.





Pottery cooking jar (© Sam Morgan Moore)

s have studied
uins, preserved in waterlogged conditions in a stream valley
f Castle-an-Dinas, close to the Belowda roundhouses.
e area was a generally damp, open, moorland
very attractive for agriculture. Nevertheless, as a result
tions we can now say that the area around the hillfort was
ed and farmed, at least on a seasonal or short-term basis,
in the late Iron Age and Roman periods.

:rip-Fields and Stream Tin

: A30 follows the main ancient
st route into west Cornwall. It probably
he line of a Roman road, and may even
rigins in a prehistoric track. In the 1760s
was established as a Turnpike road, which
straightening and improving the section
oss Moor, diverting it away from the narrow
ne through Belowda An anonymous
scribed it, writing in 1795:

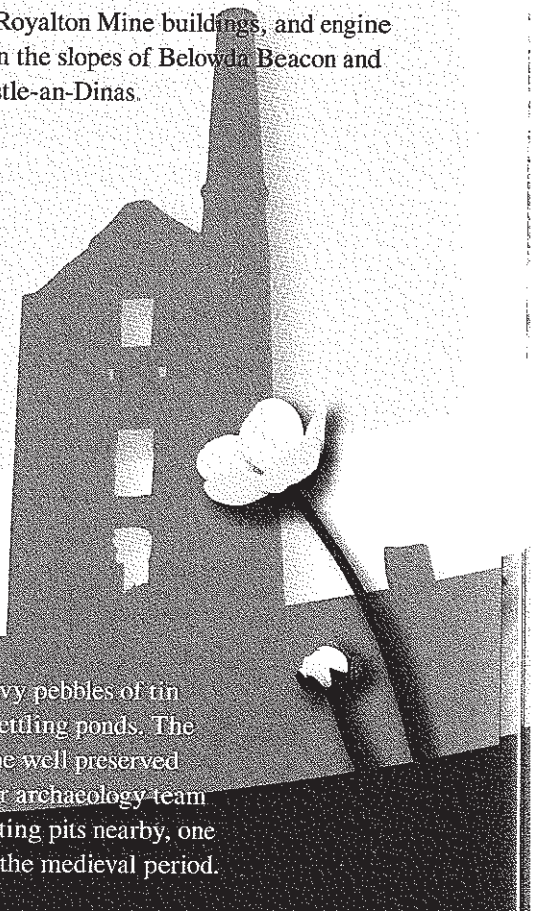
ı to the Indian Queen - 11 miles of most excellent road mostly upon a level. All moorland, not a tree to be seen on this road"

A30 route passes through a series of
erved strip fields which surround the
amlets of Belowda and Tregoss Strip fields
ıl of medieval (AD 1066-1550) 'open-field'
n Cornwall, but rarely survive in the
day. The hamlets of Belowda and Tregoss
nentioned in documents dating from the
ntury AD, but they may pre-date the
nan conquest

Tinners' settlements on Tregoss Moor are recorded for the first time in 12th century documents, although the rich tin deposits were probably being exploited long before that. By the early 14th century many inhabitants of the area were tinners first and farmers second. A document of 1309 tells us that the parson Ralph de Arundell, one of the major landowners in the area, was forced to take refuge in the Parsonage at St.Columb from an angry mob of tinners from Ruthvoes and Trevarren, after he tried to enforce the payment of dues on tin ore.

16th Century woodcut showing tinners prospecting

The heyday of large-scale Cornish tin extraction was between 1840 and 1860. A slump in the worldwide price of tin from the 1860s led to a collapse in the Cornish market and the mass emigration of miners from Cornwall. Deserted mining features from the most intensive phase of tin extraction can be clearly seen beside the new A30 road, including the scars of large-scale streamworks around the headwaters of the River Fal on Goss Moor, the Royalton Mine buildings, and engine houses on the slopes of Belowda Beacon and Castle-an-Dinas.



strial revolution, most Cornish tin was eaming' or 'panning'. This involved in ore, usually by digging trial pits d down by streams. Some tinners locate promising spots. Once an was discovered, the tinners excavated used flowing water to wash away the unwanted material, leaving the heavy pebbles of tin ore (Cassiterite) on the bottom of settling ponds. The new A30 route carefully avoided the well preserved streamworks on Goss Moor, but our archaeology team discovered three groups of prospecting pits nearby, one of which was radiocarbon dated to the medieval period.

e Marsh Fritillary Butterfly

s our archaeologists excavated dence of past environments, our ists studied today's heathland and land habitats, seeking not only to imise disturbance, but to provide e environmental gains. Here, with ples of the species that benefited, is how we did it.

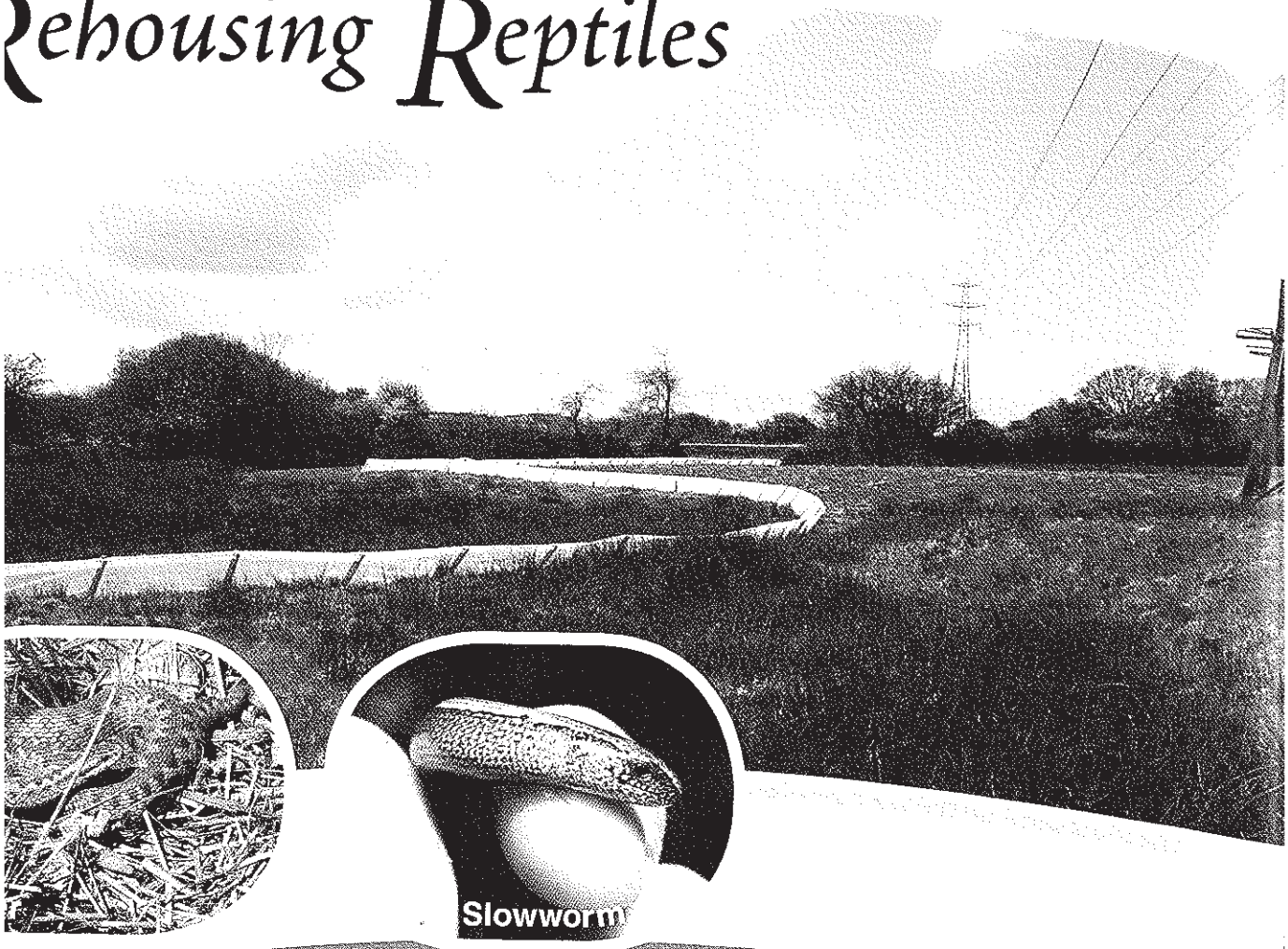
fritillary butterfly (© Adrian Spalding)

The rare marsh fritillary butterfly lives heathland and grassland areas around the A30. We nted numerous seeds and seedlings of a plant called devil's bit scabious, which is the only food eaten he marsh fritillary caterpillars. They weave a web und the plant while they feed, to protect themselves n predators.

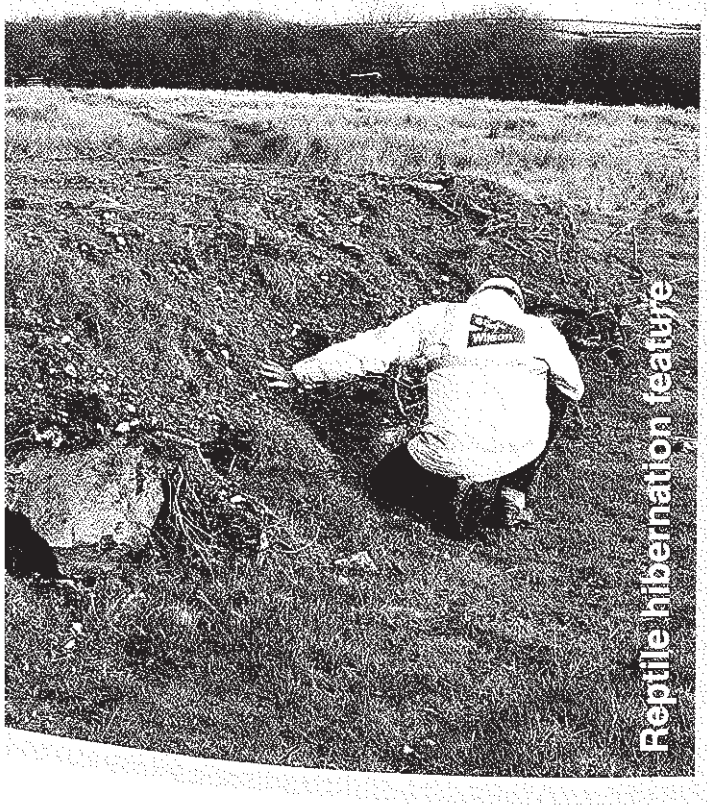
The caterpillars spend all winter in clumps of grass and emerge as butterflies in May or June. Marsh fritillaries only travel short distances, remaining in their home patch for their entire adult life. Both the heathland and grassland derive from man's past activities, particularly tree clearance and agriculture.

wed wildflower and heather seeds along the sides of the new road,
itats for the marsh fritillary. By downgrading the old road, we
ble to join two areas of Goss Moor, reuniting two habitat areas.

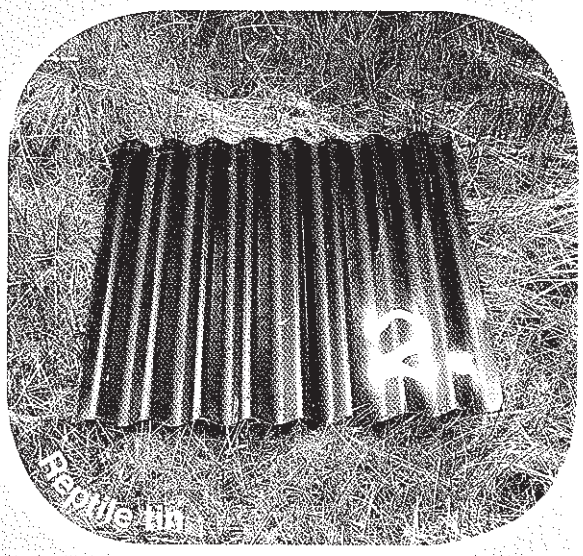
Rehousing Reptiles

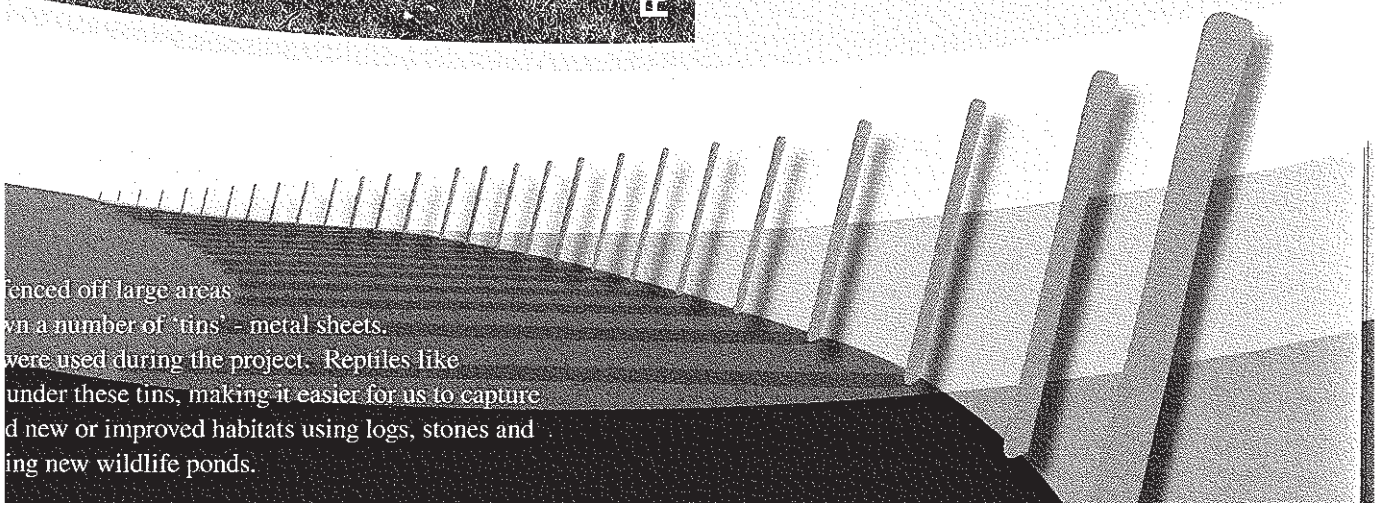


Four types of reptile were found along the A30 corridor: adder, common lizard, slowworm and grass snake. These ar all protected species, and we captured and moved the carefully, by hand, to more favourable areas.



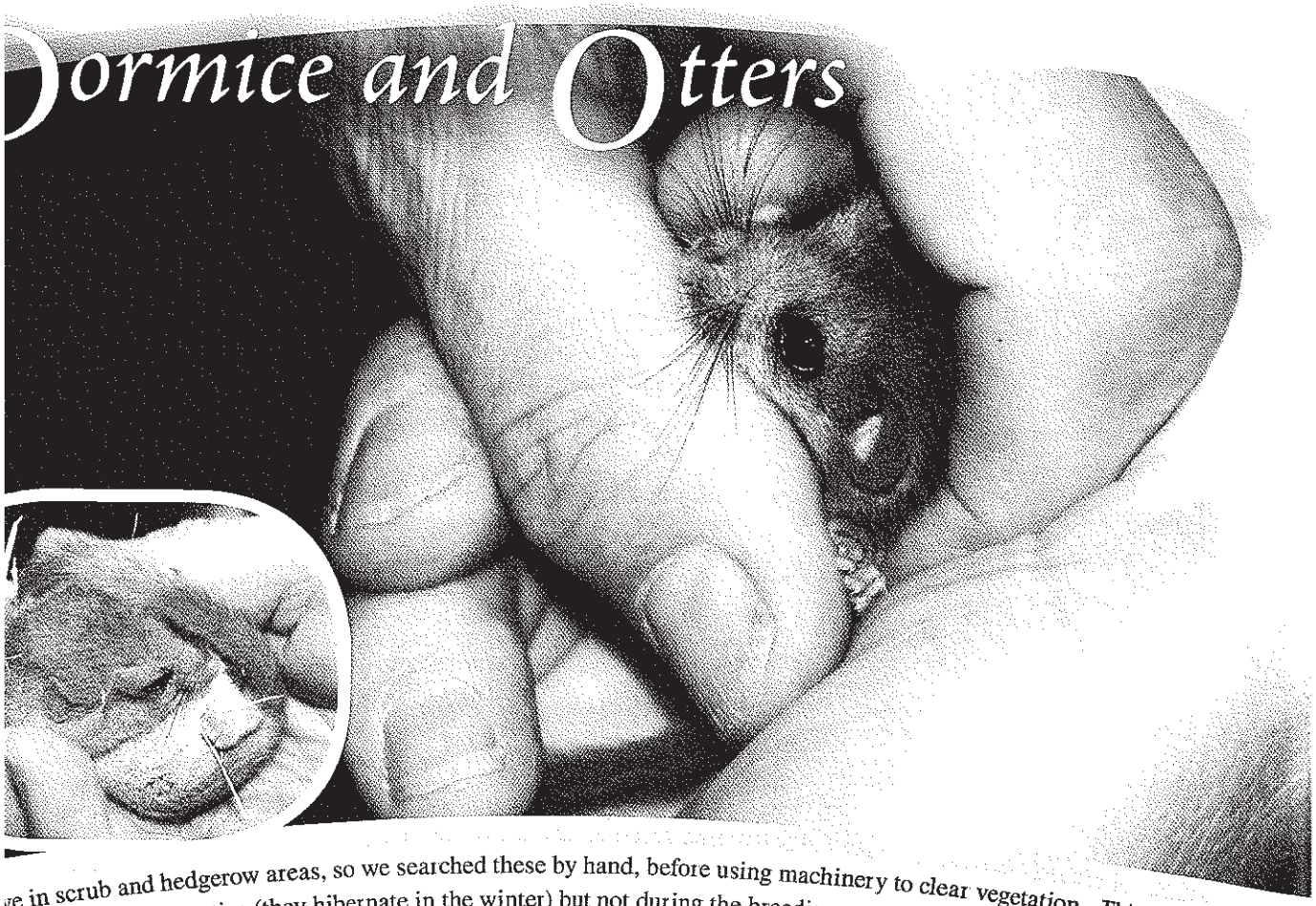
Reptile hibernation feature



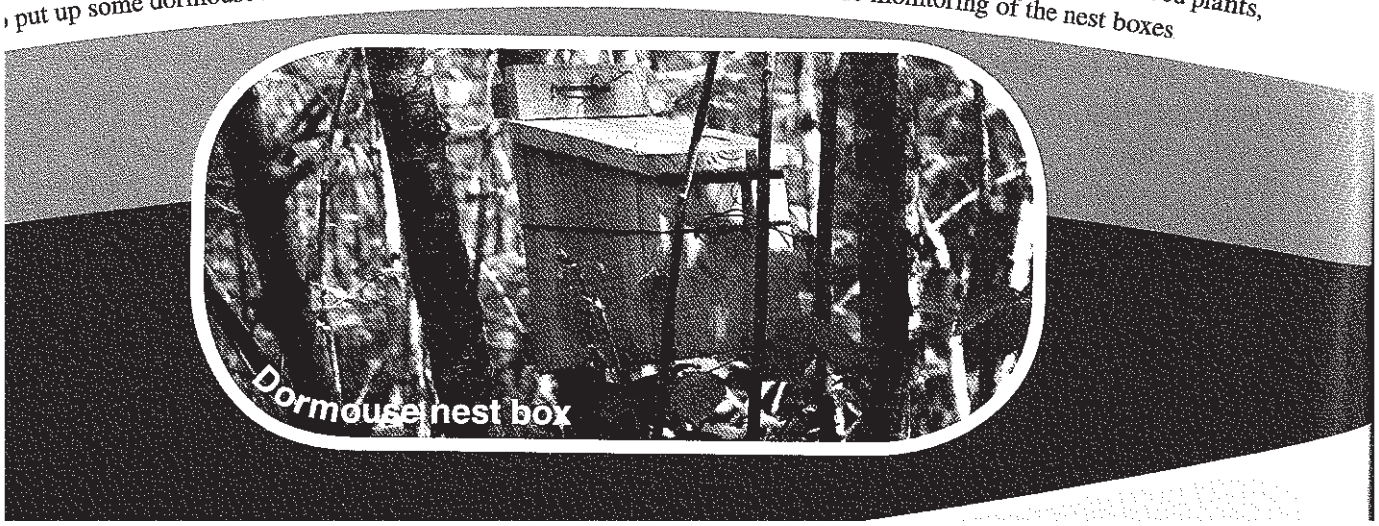


fenced off large areas
wn a number of 'tins' - metal sheets,
were used during the project. Reptiles like
under these tins, making it easier for us to capture
d new or improved habitats using logs, stones and
ing new wildlife ponds.

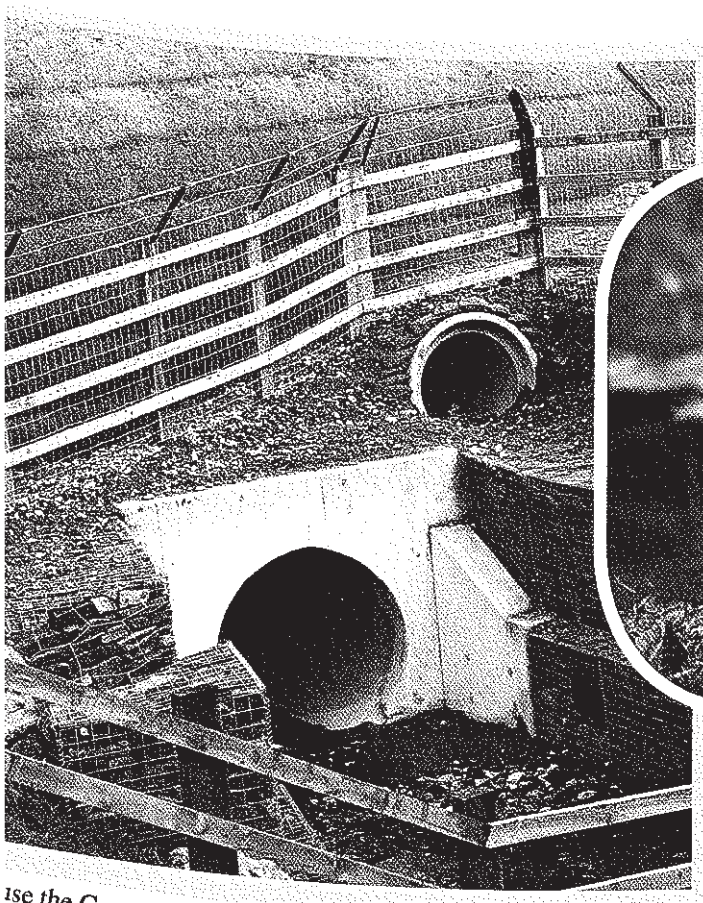
Dormice and Otters



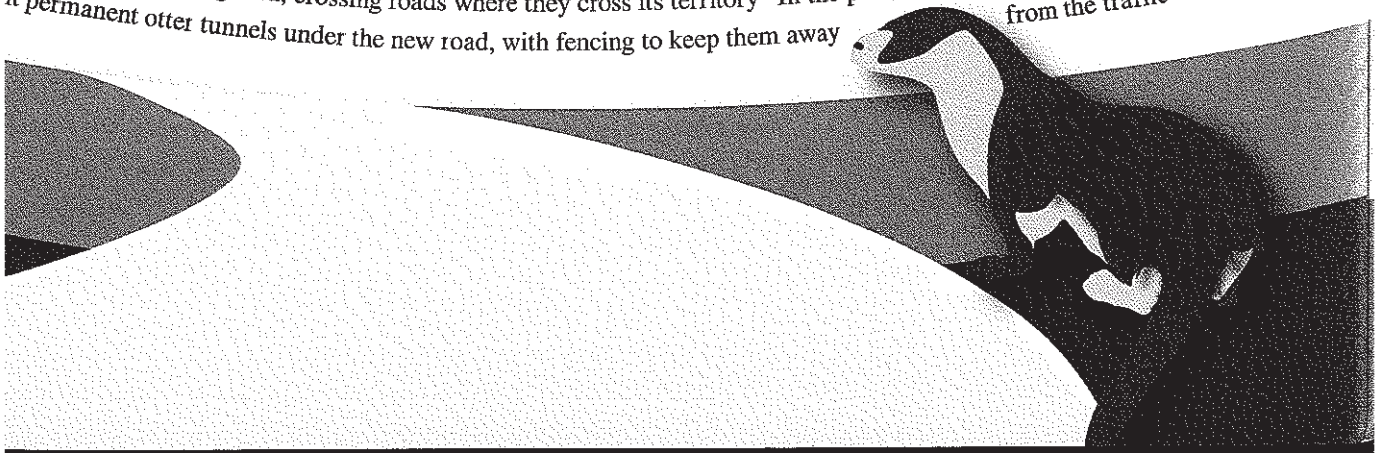
ve in scrub and hedgerow areas, so we searched these by hand, before using machinery to clear vegetation. This was the dormice were active (they hibernate in the winter) but not during the breeding season, allowing them to move to other from the road building. We linked dormice habitats by planting Cornish hedges, including their favourite food plants, put up some dormouse nest boxes. Our ongoing conservation work will include monitoring of the nest boxes.



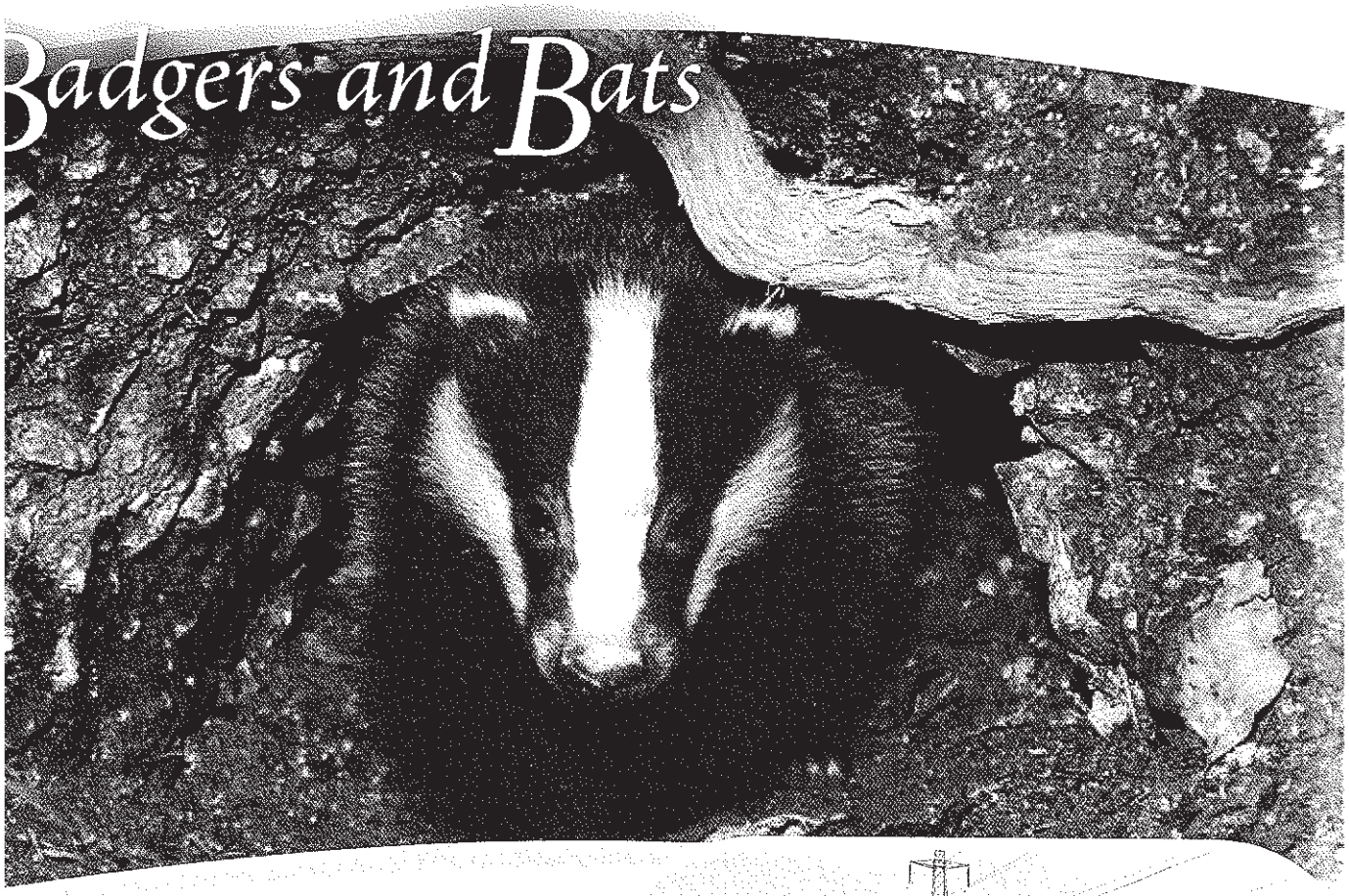
Dormouse nest box



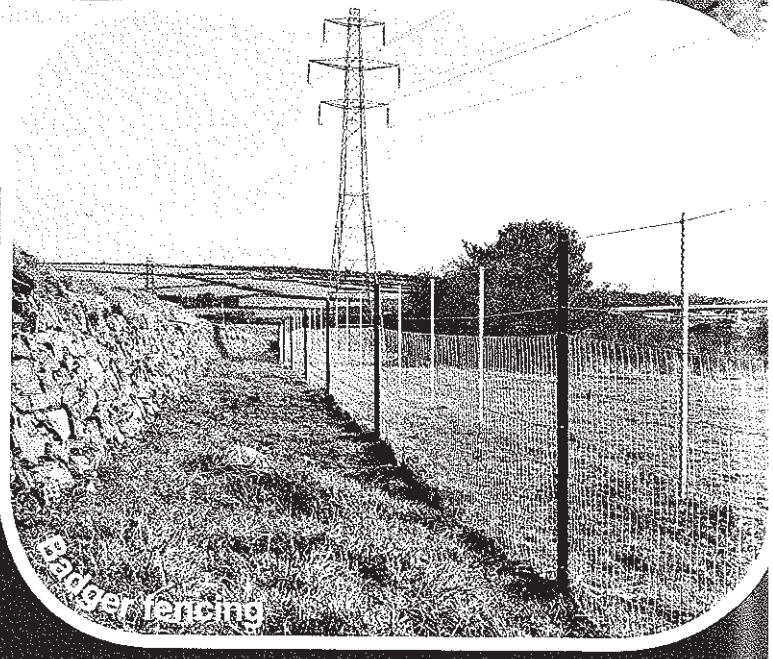
ıse the Goss and Tregoss Moors as part of their home range A male or dog otter can occupy a territory of up to 6 kilometres
istances to its feeding area, crossing roads where they cross its territory In the past, otters have been killed on the A30
lt permanent otter tunnels under the new road, with fencing to keep them away from the traffic



Badgers and Bats



We needed to move some badger
s away from the new road, so we fitted the setts
te that allowed badgers to leave but not re-enter.
ers respond to this by exploring other nearby setts
choosing one to settle in. The road can divide
eding areas, so we built special badger underpasses,
l with fencing to keep them off the dual carriageway.



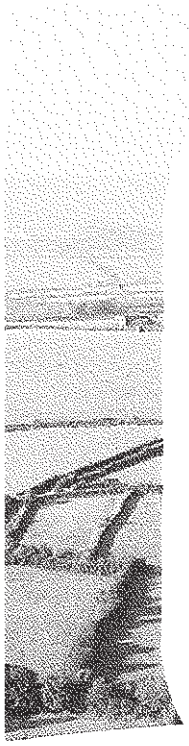
Badger fencing

a bat box

f bat

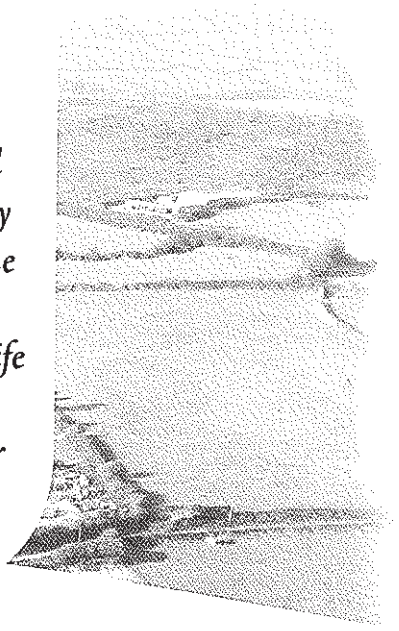
ıse the fields and hedgerows around the A30
pipistrelle, brown long-eared bat, natterer's bat
ı's (or whiskered) bat. It was important that
trees and hedgerows to replace any that were
ese are used by bats to find their way to feeding
put bat boxes up in trees, for bats to roost
e summer months. As part of our ongoing
conservation work we will be monitoring
these boxes.

Pipistrelle bats



The A30 Bodmin to Indian Queens road improvement scheme has shown that positive conservation benefits can be achieved as part of a major road development.

By improving access to the west of Cornwall the road scheme has created opportunities for tourism, industry and rural communities in the South-West. At the same time, engineers, ecologists and archaeologists have worked together to safe-guard rare and protected wildlife species and ancient monuments. In doing so we have taken the opportunity to improve the environment for the benefit of wildlife conservation, cultural heritage and public enjoyment.



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