Oxfordshire Geology Trust

Local Geodiversity Action Plan

for the

North Wessex Downs AONB

The Local Geodiversity Action Plan for the North Wessex Downs Area of Outstanding Natural Beauty has been produced by Oxfordshire Geology Trust with funding from the AONB's Sustainable Development Fund.

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Summary

The geodiversity of the North Wessex Downs AONB underpins almost every aspect of the AONB's character and dramatically influences the landscape which we see today. From the rolling hills of the chalk downland with their dry valleys to the characteristic chalk buildings and the puzzles of the sarsen stones. The influence of the North Wessex Downs geodiversity on the landscape has long been appreciated but the value of the geodiversity for recreation, land management and education has been overlooked. The Local Geodiversity Action Plan will help to promote the value of our geodiversity and the benefits that its conservation and promotion can bring to our appreciation and enjoyment of the beauty of the North Wessex Downs.

This draft LGAP represents the outcomes of a short 10 month project funded by the North Wessex Downs AONB Sustainable Development Fund. In this time it has not been possible to undertake a full geodiversity audit of the North Wessex Downs AONB nor has it been possible or appropriate to talk to all stakeholders about the LGAP and their wishes and concerns for our geodiversity. Local Geodiversity Action Plans are by their nature evolving documents and it is envisaged that over the coming months the LGAP will continue to revised and updated as targets are met and new issues and concerns arise.

As with any other management plan it is essential that LGAPS are driven and managed by specialist, dedicated organisations with the appropriate skills and experience of managing geodiversity for the benefit of all. It is also important that these organisations receive the resources needed to ensure that the LGAP and geoconservation delivers benefits to all communities influenced by our exceptional geodiversity.

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What is Geodiversity?

Geodiversity is defined as the geological diversity of an area. This can include not only the rocks, fossils, minerals and natural processes (geomorphology) of the area but also its soils, landscape, museum collections and building stone.

Geodiversity is not just important for our understanding of our ancient history. It underpins almost every part of our natural and man-made environment forming the framework for life on Earth. Rock types dictate the type of soils which are produced, and these in turn determine the types of habitats and species which will develop. It also influences where we build, where we dispose of waste and how we design our transport links. The geodiversity also influences the local water resources, climate and topography of an area, all of which influence human, animal and plant life. As a result geodiversity is responsible for a large part of an area's local character and distinctiveness.

The major influence on geodiversity of course is the local rock types and the processes which have acted on these since their formation. However, other features also affect the geodiversity not least of which is human exploitation. Humans exploit the local geodiversity both as a natural resource such as for aggregate, fuels, and building stone and as a source of water. It is often collected as local curiosities (particularly fossils and minerals) and landscape features are utilised as transport routes. This can be a positive influence on the geodiversity affecting the amount of geodiversity which is accessible, particularly for those areas where natural exposure of rocks, minerals and fossils are poor such as in the North Wessex Downs AONB. However, our geodiversity is a finite resource. Once it has been destroyed it can not be regrown, reintroduced to an area or redeveloped. It is important that we understand our geodiversity resource if it is to be conserved for the benefit of future generations.

Looking south east over the low lying vale of Pewsey towards the higher land of Salisbury Plain in the distance

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The Conservation of our Geodiversity

Although the value of geodiversity has been recognised for hundreds of years the realisation of the need to conserve and promote this most valuable resource is often overlooked. In spite of recent initiatives such as Local Geodiversity Action Plans, geoconservation is still often restricted to our geodiversity in the natural setting.

National Geoconservation Initiatives

The Geological Conservation Review (GCR)
The Geological Conservation Review was begun in 1977 by the Natural Conservancy Council (now Natural England). The GCR's aim was to identify and safeguard some of the most important national and international geological sites in Britain showing key elements of our Earth Heritage. The review was completed in 1990 and is being published in a series of 45 volumes by the Joint Nature Conservation Committee (JNCC).

Over 3000 sites have been selected nationally representing around 100 categories (Blocks) of geology and geomorphology. Many of these sites are already notified as Sites of Special Scientific Interest.
Within the North Wessex Downs AONB there are 13 GCR sites.

Sites of Special Scientific Interest (SSSI)
Sites of Special Scientific Interest represent the country's best wildlife and geological sites. The first SSSIs were designated in 1949 by the then Nature Conservancy Council. Natural England is now responsible for designating SSSIs and ensuring that they are kept in favourable condition. SSSIs receive statutory protection through the Countryside and Rights of Way Act (2000).

There are over 4,000 SSSIs in England many of which are internationally important. Some sites have been designated for both their wildlife and geological value. In the North Wessex Downs AONB there are 9 SSSIs designated for their geological value. There are also a number of SSSIs on the fringe of the AONB particular within Swindon Old Town which should be considered in conjunction with those in the AONB in order to build a representative picture of the geodiversity of the area.

Regionally Important Geological and Geomorphological Sites (RIGS)
RIGS work in a similar way to the non-statutory County Wildlife Sites in that they have no statutory protection from damage or destruction but they are often recognised by planning authorities providing them with some level of protection. The RIGS scheme was initiated in the early 1990s and is now largely managed by county based dedicated geoconservation organisations either Geology Trusts, local RIGS Groups, Earth Heritage Trusts or a like.

RIGS are designated on their aesthetic, educational, historical or scientific value. Considerations such as access are also taken into account. This means that SSSIs can also be designated as RIGS using different criteria. Oxfordshire has designated 1 RIGS within the AONB. There is one West Berkshire RIGS in the AONB, with another three sites proposed for designation. Wiltshire Geology Group have designated 5 RIGS within the North Wessex Downs AONB.

There is currently no RIGS Group or Geology Trust in Hampshire. The feasibility of establishing a group in this area should be investigated through the future LGAP process.

It should be noted that there are a substantial number of Earth Heritage sites in the area which do not have a national or local designation. This does not detract from their geoconservation value especially with reference to local communities. These sites are still in need of surveying, monitoring and where appropriate promotion.

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The Geology Trusts
The Geology Trusts was launched in 2003 as a national umbrella organisation for independent, professional geoconservation organisations. Their launch was driven by the realisation that significant advances in geoconservation could not be made through the voluntary model being utilised by existing county based geoconservation organisations.

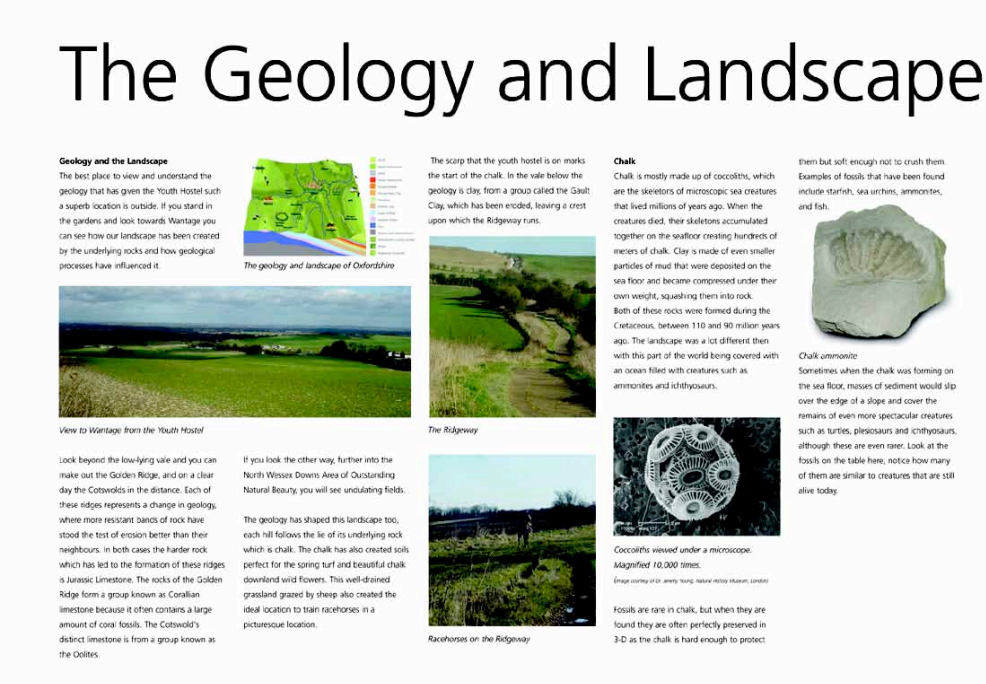
UKRIGS
UKRIGS is a national umbrella for county RIGS Groups. They were established in 1999 and aim to encourage the appreciation, conservation and promotion of Regionally Important Geological and Geomorphological Sites for education and public benefit.

Geoconservation in North Wessex Downs AONB

Oxfordshire Geology Trust
Oxfordshire Geology Trust is the only dedicated geoconservation organisation in the county. The Trust was launched in 2000 (under its former name of Oxfordshire RIGS Group) and continues to undertake both protection and promotion work. Oxfordshire Geology Trust is the body which designates RIGS in the county.

Protection of sites is gained, not through restricting development or use of sites but through continued working with landowners, land managers, developers and local communities. By advising on management techniques we can help to enhance the geodiversity value of a site and help to manage this. This can often be done through the development of detailed holistic site geodiversity management plans. Sites can also receive protection through the non-statutory RIGS designation (Regionally Important Geological and Geomorphological Sites). These sites are included on planning authority alert maps. The Trust holds the only comprehensive database of geological and geomorphological sites in the area, which is constantly growing as survey work continues.

In order to be effective at protection it is essential to first promote the value and range of our geodiversity. The Trust does this in a number of ways. Through public and school events, publicity, publications such as newsletters and the 'Secrets in the Landscape' trail guides, training events, and consultation meetings.



One of the panels produced for the new interpretation centre at the Ridgeway Youth Hostel by Oxfordshire Geology Trust

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Berkshire RIGS Group
The Berkshire Regionally Important Geological and Geomorphological Sites (RIGS) Group was set up in 2003 to protect and conserve the most significant geological and geomorphological features from loss or damage and promote their use for education and research. Several sites of geological interest have been identified in West Berkshire as part of a project to register potential geologically significance sites in the North Wessex Downs Area of Outstanding Natural Beauty. A number of public events have also been held as part of a AONB funded project.

Contact Lesley Dunlop on 01993 814 147 or email Lesley.dunlop@oxfordshire.gov.uk

Wiltshire Geology Group
The Wiltshire RIGS group has selected, described and kept an eye on over 60 sites of local geological importance since 1990. In 2003 it was reconstituted as the Wiltshire Geology Group, fully independent of its parent body, the Wiltshire Wildlife Trust, though remaining affiliated. The change of name signaled a broadening of the group's work to include raising public awareness as well as listing and protecting RIGS. The Wiltshire Geology Group aims to promote an interest in the geology of the county, drawing people's attention to the way the landscape, and the towns and villages within it, are influenced by the underlying geology.

When funding is available, the group continues to add to its series of geology and landscape trails as well as regularly putting on displays and activities at local museums, leading field trips and giving presentations to local groups. In the coming year we are hoping to produce two geology and landscape trails in the North Wessex Downs AONB, covering the Vale of Pewsey and the Marlborough Downs.

Contact Isobel Geddes on 01380 871 008 or email geddes@wiltshiregeologygroup.freeserve.co.uk

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Local Geodiversity Action Plans – Purpose and Process

The purpose of LGAPs

The LGAP process and framework follows on from the realisation that geodiversity and geoconservation needed an effective mechanism for delivering benefits just as biological conservation has received from the Biodiversity Action Plan (BAP) process. Unlike biological conservation, there is no statutory requirement or legislation driving the LGAP initiative just the knowledge that something is required to steer geoconservation forward. This has its advantages in that each LGAP area can focus on the issues and requirements important to that area. Natural England and others are exploring the possibility of a national GAP.

This Local Geodiversity Action Plan for the North Wessex Downs AONB will form the basis for future geoconservation work within the LGAP area. It will be of value to geoconservation organisations working in the area and locally, landowners, quarry operators and to local communities who want to take an active role in the management of their local environment. It will also help to guide planners and provide information to other conservation organisations such as those involved with biological and archaeological conservation.

For LGAPs to be effective they should involve a wide range of stakeholders in the consultation and implementation process. Individual stakeholders may prefer to be involved at different stages of the LGAP process. This should be encouraged as each brings with them their own experience and resources to the process which may be more relevant at specific stages.

The LGAP will also highlight that geodiversity is not just about our exposed rocks and fossils which have already received protection, to a greater or lesser extent, through designations such as Sites of Special Scientific Interest or Regionally Important Geological and Geomorphological Sites. There are a wealth of local sites and features which have no designations but which are still incredibly valuable to local communities and geologists alike. It will also highlight the fact that within the AONB there is not a great deal of variety within the geodiversity but that there are landscape features and geomorphological features which are of significant interest and value.

LGAPs are evolving documents. It is planned that this first edition of the North Wessex Downs AONB LGAP will be revised in the first 12 months of its publication. It may be that the action plan needs monitoring yearly initially as many stakeholders are still unaware of the value of our geodiversity, its conservation and the benefits that their involvement can bring to all parties.

Meeting of Europarc delegates at White Horse Hill, Uffington, September 2006.

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The Geographical Boundary

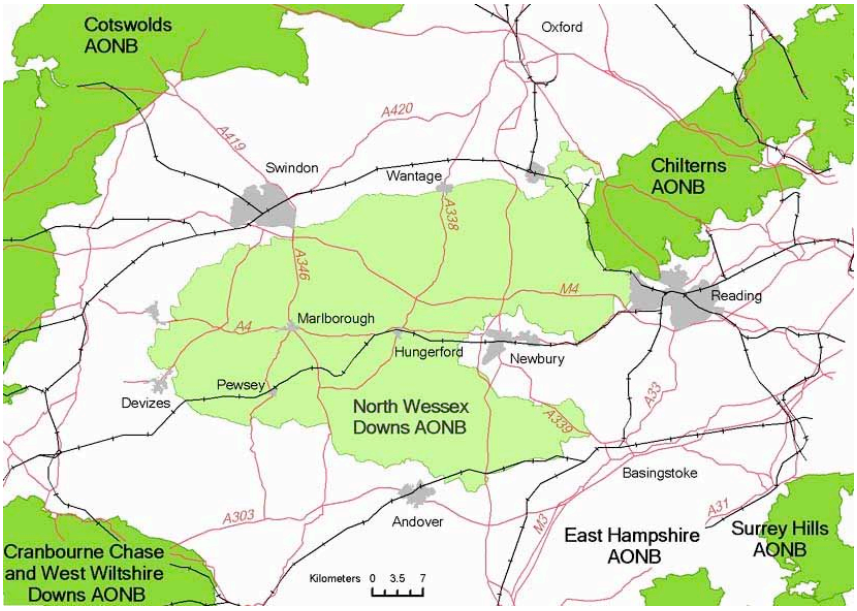
As with all management plans for the natural environment it is essential that the plan covers a well defined geographical area. This LGAP covers the whole of the North Wessex Downs AONB as it is already a well established and recognised region with a cohesive approach to the conservation of the natural environment. A single LGAP for the entire AONB will help to highlight the need for an improved focus on the value and conservation needs of the local geodiversity as an inherent feature of the North Wessex Downs AONB.

Preparing the Plan

Oxfordshire Geology Trust was awarded a Sustainable Development Fund grant from the North Wessex Downs AONB for a preliminary audit of the area's geodiversity and to initiate the LGAP process. Data collected from the audit has helped to feed into the action plan. All of the field data collected will be maintained at the Trust's Geological Records Centre and is open to anyone with an interest in the local geodiversity. Although Oxfordshire Geology Trust is the author of the LGAP, it has been produced after wide consultation with stakeholders representing a variety of interests from geological through to planning, biological and local interests.

The following organisations/individuals have been consulted:

Berkshire Buckinghamshire and Oxfordshire Wildlife Trust
Berkshire RIGS Group
English Heritage
Friends of the Ridgeway
FWAG
Hampshire County Council Museums and Archive Service
Hampshire County Council Planners
Hampshire and Isle of Wight Wildlife Trust
Hampshire Soils Project
Individual landowners
Local teachers
National Trust
Natural England
North Wessex Downs AONB
Oxfordshire County Council Waste and Minerals Planners
Oxfordshire Nature Conservation Forum
Ridgeway National Trail
Ridgeway Youth Hostel
Streatley Youth Hostel
Thames Valley Environmental Records Centre
Vale of White Horse District Council Planners
West Berkshire Ramblers
West Oxfordshire District Council Planners
Wiltshire County Council Planners
Wiltshire Geology Group
Wiltshire and Swindon Biological Records Centre
Wiltshire Museums Service



Map showing the location of the North Wessex Downs AONB

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The success and implementation of the LGAP will be continually monitored to ensure that the targets outlined below are being met. Stakeholders will be encouraged to participate in this monitoring so as to help to determine the success of the LGAP as well as new issues and needs as they arise.

Geodiversity Audit

As part of the production of this action plan a preliminary geodiversity audit of the North Wessex Downs AONB was undertaken focusing on SSSIs and RIGS. It was not possible due to restrictions in time and resources to undertake a fuller geodiversity audit. The information gathered from this audit fed into the action plan and will help to identify future priorities for protection and conservation of our geodiversity sites.

Data collected from the audit will be retained by Oxfordshire Geology Trust in the Geological Records Centre and is available for consultation by interested individuals and organisations.

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North Wessex Downs AONB Geodiversity Resource

The geodiversity resource is a fundamental aspect of the North Wessex Downs. It underpins almost every aspect of the character of the AONB and influences dramatically the landscape which we see today. However, it is not the more well known features of geodiversity, by which quarries and natural craggy outcrops are the most common which are the most valuable to the AONB, but it is the more subtle influence of the underlying geology on the landscape and biodiversity of the area.

The North Wessex Downs has only a small number of rock types present at the surface yet these tell a fascinating story of major climatic changes and immense crustal movements. The majority of the AONB is underlain by chalk resulting in the beautiful gentle rolling topography which is so characteristic of the North Wessex Downs. The area records sedimentary deposition which took place from Cretaceous to Quaternary times. Overlying the chalk are patches of Palaeogene and Quaternary sediments which contrast with the chalk scenery by producing more acidic soils. The area has undergone periods of uplift and tilting which created the small anticlines (upward folds) of the Vale of Pewsey, Vale of Ham and Kingsclere Inlier exposing the older Upper Greensand enclosed by younger Chalk.

The steep scarps of the northern edge of the AONB and of the Vales of Pewsey and Ham give excellent view points over the beautiful chalk downlands and the surrounding landscape.

Lower Cretaceous (145 – 99 million years ago, 112 – 99 million years ago exposed in AONB)
Only the top most part of the Lower Cretaceous, the Gault Clay and the Upper Greensand, are found in the AONB. The Gault Clay is restricted to a narrow band marking the foot of the Downs on the northern margin. This blue-grey mudstone has historically been extracted from the Swindon and Devizes area for brick making. Unfortunately exposures are no longer visible here. The fossils of the Gault Clay are often poorly preserved crushed shells which are quickly destroyed by weathering.
The junction between the Gault Clay and the overlying Upper Greensand is marked on the northern edge of the AONB by a spring line which gave rise to the development of the villages such as Cherhill and Uffington as well as larger settlements such as Wantage just on the edge of the AONB. The sands and silts of the Upper Greensand are rich in a mineral called glauconite giving them their green colour. As well as tracing the foot of the northern scarp of the AONB the Upper Greensand is also seen at the surface in the Vale of Pewsey as a result of the uplift of the basin. The Upper Greensand is incredibly variable from place to place in both appearance and in age. Towards the top of the Upper Greensand is a bed known as the Malmstone. This is a hard sandstone composed of siliceous sponge spicules held together with a silica rich cement, hence the hardness.

Upper Cretaceous (99 – 65 million years ago, most exposed in AONB)
The Upper Cretaceous chalk dominates the solid geology of the AONB as well as much of its landscape. Although there is around over 200 m thickness of chalk in the AONB it is thought that as much again has been removed from the top as a result of erosion during the last 65 million years or so when the basin was uplifted and tilted.
Chalk is a pure limestone which is 98% calcium carbonate. It is restricted to the Cretaceous period in England and stretches in a sideways u-shape from the Yorkshire Wolds to Devon and across through Kent.

At first appearance the chalk can look very unimpressive and uniform throughout. However, it is possible to distinguish a Lower, Middle and Upper Chalk based on variations in lithology and appearance. These can be summarised as –

Lower Chalk – a clayey chalk often with glauconite at the base giving it a green tinge. It becomes purer upwards with a number of persistant beds recognisable including the Totternhoe Stone which is hard band locally used as a building stone. The Lower Chalk is moderately fossiliferous and contains no flint.

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Middle Chalk – the thinnest of the three, this is a nodular chalk with marl layers. Flints are absent in the lower layers but become increasingly common higher up. The base of the Middle Chalk is marked by a hard band known as the Melbourn Rock. This is a thin bed only 1-2 m thick, which contains yellow/brown nodules.

Upper Chalk – this is by far the thickest of the chalk divisions reaching 210 m in parts of Wiltshire. The base of the Upper Chalk is locally marked by another hard condensed sequence commonly known as Chalk Rock. Again some glauconite is found in this nodular chalk which reaches 4-5 m thick around Marlborough. The rest of the Upper chalk is a very characteristic soft white chalk. It is thickly bedded and flints are common either scattered or as beds parallel to the chalk bedding.

Fossils are scattered throughout the chalk and can be difficult to find. However, a wide range of fossil groups are present in the chalk including bivalves, brachiopods, echinoids, gastropods, belemnites, sponges and coral. Fish and shark teeth have also been found.

The formation of flint is not well understood. It is thought that it forms as a result of the concentration of silica (dissolved from the skeletons of silicious animals such as sponges and some plankton), sometimes in preserved burrow structures and sometime as isolated nodules when the chemistry of the groundwtaer changes.

Palaeogene (65 – 23 million years ago, 55 – 40 million years ago exposed in AONB)
It is probably true to say that the deposits of the Palaeogene in the North Wessex Downs are not impressive. They are by and large unconsolidated sediments which provide no distinctive landscape feature other than the development of neutral to acidic soils leading to the establishment of heath type vegetation and are extremely poorly exposed. However, the Palaeogene deposits record a time of significant change in Britain's palaeoenvironment. At the end of the Upper Cretaceous there was a period of earth movements (tectonic activity) and a global fall in sea level. Britain drifted northwards (continental drift) with southern Britain being uplifted and gently tilted to the south; the northerly effects of the creation of the Alps. Subsequent erosion of the new land removed some 200 m of Cretaceous chalk. During this time there was also a major extinction of both land and marine organisms which is best known for the demise of the dinosaurs. The consequence of this extinction was the radiation of new groups particularly the mammals and birds, hence the time from the Palaeogene onwards is known as the Cainozoic meaning 'new life'.

Small outcrop of Middle Chalk along a footpath

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The London Clay which is probably the most well known of the Palaeogene deposits in the south of England. It is a bluish to brown clay with some sand and silt beds especially at the top and bottom of the unit. It has a poor diversity of fossils though in the Thames Estuary it has yielded over 500 species of plants. It has historically been exploited locally for brick making.

By far and away the most obvious of the Palaeogene rocks are the sarsens. These scattered blocks of hard sandstone are one of the most identifiable and well known aspects of the AONB's geodiversity. They are the remains of the unconsolidated Palaeogene sediments which have been variably cemented by silica. The removal of the uncemented material left the sarsens lying like dropped marbles on the chalk. The potholed appearance of the sarsens is another indication that cementation must have been very patchy. Recently formed examples can be seen in Australia and Africa where groundwater saturated with silica percolates through unconsolidated sands and deposits the silica as localised chemical or physical changes take place.

The famous uses of the sarsens includes the prehistoric stone circles of Stonehenge and Avebury and the burial mound at Waylands Smithy and West Kennett Long Barrow. Their continued exploitation as a good quality building stone has led to a much depleted number of sarsens visible in their natural position. Several sites are now protected for the sarsens including the SSSIs of Fyfield Down and Piggledene.

Quaternary Deposits (2 million years ago to Present)
Between the Palaeogene and Quaternary deposits there had once again been huge environmental change in Britain this time as a result of numerous glaciations and the earth movements in southern Europe uplifting the Alps. Some 20 million years is unrecorded in the sediments of the North Wessex Downs between the Palaeogene and the Quaternary. Although much of England was covered by advancing ice at some point during the last 2 million years there is no evidence in the North Wessex Downs that the ice ever covered this part of sourthern England. There is evidence though in the sediments and in the landscape that the area suffered periglacial conditions.

The history of the Quaternary in the North Wessex Downs is, like elsewhere in the country, incredibly difficult. This is due largely to the difficulty correlating Quaternary deposits and the complexity of the sediments. In the AONB there are three principle types of Quaternary deposit. There are the river terrace deposits, alluvium (modern day river sediments) and a deposit known as clay-with-flints.

A rare exposure of Palaeogene Reading Beds at a SSSI

© Oxfordshire Geology Trust

It is thought that the river terraces were cut during the cold periods and not during the warmer interglacial periods of the Quaternary. As ice sheets grew so sea level fell rejuvenating rivers and increasing their erosive power and so they cut deep into the bedrock. The terrace sediments are predominantly gravels with sand though some clays and muds are also preserved. The terrace development reflects the successive cutting of ancient floodplains, the older terraces being the highest ones preserved. Terraces and their sediments have been preserved in all the major modern day river valleys in the AONB. Alluvium is the modern day deposits of rivers. It is mainly silt and clay but can also contain sand and gravels from flood events. Older alluvium found in the bottom of river valleys, particularly the Kennet Valley and dry valleys in the AONB has yielded Mesolithic artefacts.

Unlike the terrace deposits and the alluvium the clay-with-flints is not the result of river channel activity. It is the remains of the Cretaceous chalk after the effects of intense weathering plus a residue of tertiary sands. It is exactly as it sounds, often brown or reddish clay with abundant flints which covers large parts of the chalk downland. It can often be mapped by the presence of woodland particularly in the central and southern parts of the AONB.

Geomorphology and Landscape

The landscape and geomorphological features dominate the geodiversity resource of the North Wessex Downs. The steep scarp slopes of the chalk with their beautiful view points and the more gentle rolling open plateau of the chalk are both parts of the landscape directly influenced by the underlying geology. The value of this landscape has been reflected in human land use since Mesolithic times with the development of the Ridgeway footpath and the innumerable ancient momunents and settlements which are found all over the North Wessex Downs.

One of the more impressive and obvious geomorphological features of the landscape are the dry valleys or coombes. These can be found all over the Cretaceous chalk plateau often forming impressive, deep rounded valleys. They are the result of torrents of water flowing over the surface of the chalk during cold periods when permafrost (frozen ground) made the chalk impermeable. The combes are often associated with terracettes along the valleys such as those at White Horse Hill in Oxfordshire. These are solifluction depositions resulting from the gradual movement downhill of soil and frost shattered chalk during times of partial thaw. If large amounts of material is moved down the slope of the valley it accumulates in the valley bottom forming a deposit known as head. It some places it has been possible to identify successive cold and warmer periods from the layering of head deposits.

Sarsen stones used at Avebury

© Oxfordshire Geology Trust

A large coombe with the effects of solifluction seen on the slopes

It is was thought that the relative accumulation of sarsen stones in valley bottoms may have been the result of solifluction processes transporting the stones downhill. However, the concentration of stones along dry valleys is considered to be the result of patchy cementation due to capillary action drawing water up vegetation roots.

It is also possible to see active fluvial processes within the AONB. These are the present day processes which will shape the landscape of the North Wessex Downs into the future e.g. Kennett Valley, and forms part of the geodiversity resource of the area.

Other geomorphological features have been recorded in Palaeogene and Quaternary deposits elsewhere but are not well documented within the AONB. These include features such as ice wedges where freeze thaw action has opened cracks in the ground surface which have later been infilled with gravels and sands. More research is needed within the AONB to ascertain their presence here.

Sarsen stones in the bottom of a dry valley on the Marlborough Downs

© Oxfordshire Geology Trust

Building Stone
Although there is a general lack of true building stone within the North Wessex Downs much of the local geology has been utilised for construction. The only true building stones are the hard bands of the Melbourn Rock, the Chalk Rock and sarsen stones. The chalk is not an ideal building stone as it not waterproof and so foundations of flint, brick or occasionally hard bands within the Upper Greensand have been used to prevent damp. A thatch roof with overhanging eves also helps to prevent rainwater dissolving away the walls. The chalk has also been used to create cob, a mixture of clay or chalk, water and straw which is built up in layers to create walls. Again, this isn't waterproof and so thatch roofs where beneficial.

Sarsens have been used as construction materials since Neolithic times. Their resistance to weathering once the outer parts were hardened made them prized stones. Their use can be seen all over the downs from the now popular attractions of the major ceremonial and religious sites of Avebury and Waylands Smithy. Sarsens are still commonly seen as footings in medieval and post medieval cottages and agricultural buildings.

The Gault Clay and London Clay have been used for brickmaking. Kintbury and Hermitage where major brick making areas in the 18th and 19th centuries utilising Palaeogene clays. In the Kennet Valley there was a medieval tile and pottery industry also utilising the Palaeogene clays.

As mentioned above flints have been used as waterproof foundations for chalk buildings but they are also a common sight as a more major component of walls. They are generally used in conjunction with brick to produce a more decorative feature and stronger structure. Flints have been used both in their natural state and have also been knapped to form a flatter surface again another decorative quality.

Soils
Soils are also a particularly valuable part of the AONB's geodiversity as they support the distinctive habitats which give the North Wessex Downs one of their characteristic features. Each rock type can be associated with a particular soil type and hence a particular habitat or land use. In the North Wessex Downs these are broadly –

Churches like this one at Chisbury of are often built of flint as it is more durable than chalk.

© Oxfordshire Geology Trust

- Upper Greensand producing neutral to acidic soils with thick woodland thriving on the steep slopes particularly in the north of the area
- Chalk producing thin and light, free draining calcareous soils supporting the important natural chalk grasslands and more recently arable land
- Tertiary sands producing brown soils, acidic to neutral with a marked change in vegetation to acid loving heath type vegetation
- Clay-with-flints giving a damp heavy soil which is often waterlogged, usually neutral they can be acidic and support dense woodland such as Savernake Forest

Soil exposures are rare. Good indications of soil type and consequently the underlying rock type can be seen at the base of fallen trees.

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Implementation

Relationships with other Management Plans

The LGAP should not be seen as a stand alone document which exists outside of other local and national management plans, strategies or policies. Many of these other documents can directly influence the local geodiversity resource and can also be informed through the LGAP. One of the roles of an LGAP is to seek benefits to the local geodiversity through these plans and planning strategies. Some of the relevant documents include –

Planning Policy Statement 9 (PPS9) – Biodiversity and Geological Conservation

Planning Policy Statements (PPS) are governmental guidance for local planning policy. The LGAP will form a valuable resource for helping to fulfil the PPS9 requirement to conserve and enhance geodiversity through the planning process.

North Wessex Downs Management Plan

The AONB covers 1,730 sq km and is the largest AONB in South East England and the third largest nationally. It was created in 1972 to give a protective coherence to one of the largest tracts of chalk downland in southern England which is least affected by development. The management plan, published in January 2004, was prepared on behalf of the AONB's Council of Partners and is a statutory requirement of the CRoW Act (2000). The plan sets out the ambitions for the North Wessex Downs within 15 policies and a 3 to 5 year action plan.

Local Planning Policies

The local planning system is currently undergoing a re-organisation with the existing Local Development Plans being replaced by Local Development Frameworks (LDFs). The LGAP is an ideal way of ensuring that geodiversity is included within the new LDFs in a similar way to the use of LBAPs previously.

The new LDFs within the LGAP area are Basingstoke and Deane Borough Council, Hampshire County Council, Kennet District Council, North Wiltshire District Council, Oxfordshire County Council, South Oxfordshire District Council, Swindon Borough Council, Test Valley Borough Council, Vale of White Horse District Council, West Berkshire Council, and Wiltshire County Council

Historic Landscape Characterisation Programme (HLC)

The HLC programme was initiated in the early 1990s by English heritage as a powerful tool to provide a framework for broadening our understanding of the whole landscape and contributing to decisions which affect tomorrow's landscape. The programme runs in partnership with County Council or equivalent Sites and Monuments Records Centres and Historic Environment Records offices. The HLC has been completed in West Berkshire and Hampshire and within the AONB, it is still underway in Oxfordshire and Wiltshire.

Historic Environment Character Zoning

This programme takes the HLC one step further combining other Historic Environment Records data to see how they interact with other landscape scale data including geology and soils. It is hoped that the character zoning will help to make the HLC programme more beneficial for strategic management of the historic environment. This initiative is currently only underway in West Berkshire.

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Local Biodiversity Action Plans (BAPs)

Our biodiversity is inextricably linked to our geodiversity. Many geological sites are important for biodiversity and vice versa. By working with ecologists and with the BAPs covering the area we will be able to deliver significant benefits to both geodiversity and biodiversity. The six BAP covering the LGAP area are the Berkshire, Hampshire, Oxfordshire, Reading, Swindon, and Wiltshire.

Through continued consultation with BAP authors we will be able to deliver benefits to both our biodiversity and geodiversity through the BAPs and the LGAP.

Other GAPS

The Oxfordshire LGAP was produced in 2002 and was the first LGAP to be produced by a dedicated geoconservation organisation. This LGAP sat within the Oxfordshire BAP as a Habitat Action Plan with the lead partner being Oxfordshire Geology Trust. It has recently been removed from the BAP and is now a stand alone document managed directly by Oxfordshire Geology Trust.

The Future of the LGAP

It is anticipated that the Draft LGAP will undergo further consultation which will lead to the production of a full LGAP for the North Wessex Downs AONB within the next two years. At this stage the AONB Council of Partners may wish to adopted the LGAP.

The development of a North Wessex Downs Geodiversity Forum is also envisaged. This will consist of stakeholders involved in the early development of the LGAP plus others as and when they are identified) who will meet once a year to discuss the progress of the LGAP and to identify emerging objectives and actions. This will serve as a way of monitoring the success and implementation of the LGAP. Oxfordshire Geology Trust will lead this process for the foreseeable future as the only dedicated geoconservation with the resources to currently do this.

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The Action Plan

Objective	***Action***	***Timescale***	***Potential Partners***
Develop the role of geoconservation organisaitons within the AONB	Investigate the possibility of establishing a Hampshire Geology Trust	2008	
	Identify persons/organisations to assist with soil surveying	Ongoing	
	Encourage the involvement of volunteers in local geoconservation organisations and provide training opportunities	Ongoing	
	Secure resources to help with the development of LGAPS in areas adjoining the AONB	2008	
Promote the value of the AONB's geodiversity as a key part of its character	Use viewpoints to interpret geology and landscape	Selection of sites by 2008	
	Hold on-site training events for people involved with aspects of nature conservation in the AONB looking at links between these and geodiversity	1 per year in each county/unitary authority	
	Highlight the AONB's geodiversity with planning authorities	Have RIGS on alert maps by 2008	
	Promote the value of using the AONB to teachers through INSET days	2009	
	Hold a series of public events in the AONB and on the fringe to raise awareness of geology among the general public	5 per year organised by geoconservation groups	
	Work with tourism authorities to explore the possibilities for geotourism in the AONB	2009	
Manage the geodiversity resources of the AONB as a distinct feature	Hold an annual Geodiversity Forum meeting	1 per year	
	Develop a programme of site auditing for all lithologies and features and begin implementing this	2008	

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	Work with National Trust and other organisations to manage sarsen stone sites	2008	
	Develop a programme of soil surveying across the area	2009	
	Identify further stakeholders who may benefit from and help to deliver LGAP objectives	ongoing	
	Work with local museums to develop geological displays and other uses for the collections	2009	
	Develop strong relationships between geoconservation organisations and the landscape sub-committee of the AONB Council of Partners	ongoing	
	Include the fringe of the AONB in the LGAP objectives e.g. holding public events in settlements just outside the AONB boundary	2008	
	Explore the possibilities of working with landowners to benefit geodiversity and their land management	2009	

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