

ENVIRONMENTAL AUDIT

PRESTWOOD NATURE AREA

The area

Prestwood Nature covers parts of the Hughenden, Great Missenden and Great & Little Hampden parishes. It is wholly within the Chilterns Area of Outstanding Natural Beauty and the landscape is one typical of the Chilterns, a tapestry of small settlements, fields bounded by hedgerows, and frequent woods. Rounded clay-capped chalk hills are cleft by steep-sided dry valleys that provide scenic charm.

The importance of the local environment

To a great extent we take our environment for granted. It is simply there, we move through it, we exploit it, we may even admire it, but few take care to ensure that it will continue to provide these opportunities. Because we are so totally dependent on this environment, we cannot even countenance its not being there. We cannot survive without pure air to breathe, safe water to drink, soils for growing food, and a stable climate in which we can plan and live in comfort without fear of everyday disaster. While urban lifestyles can provide many of our needs, and may even seem preferable to having to cope with the threats and uncertainties of "wild nature", we remove ourselves from contact with nature at our peril. Most residents of this area value space in which to feel free, experience natural sounds, and relax in green surroundings, which provide emotional and psychological relief and sustenance. People who have no appreciation of nature or their environment cease to value them or care for them, failing to appreciate that they are eroding the very foundation of human existence.

We share our environment with innumerable other organisms. Attitudes to these vary from wonder at the diversity of life, fascination with the forms and habits of different wildlife, through interest in how they may benefit us (food, dyes, medicine, natural pest control), to annoyance at their interference with our own lives (stinging nettles, rabbits, squirrels, agricultural weeds) and irrational fear ("wildness", spiders, snakes). But the environment is sustained by communities of natural species in temporary balance, as trees and other plants absorb carbon dioxide, established natural grasslands prevent loss of rainwater, fungi sustain trees and grassland, invertebrates break down excessive dead organic matter, predators control prey. Our air, water, and soils depend on these communities. Whether one adopts the religious view that all life forms are sacred, or the scientific one that every creature has evolved to fulfil a niche in a balanced ecological community, or the humanistic one that our lives are richer for experiencing the wonder and mystery of other life forms, we need to be concerned to conserve these balanced eco-systems, their habitats and the species that make them up.

We therefore need to concern ourselves with maintaining the quality of our environment. Below we assess the current state of our environment in relation to

- (a) land-use and the associated habitats and natural communities
- (b) air quality
- (c) soil conservation
- (d) water quality and conservation
- (e) noise and light pollution
- (f) human heritage
- (g) climate change.

But first, in order to understand fully our relationship to the environment, we look at how human settlement and use of the land has developed over time.

History of man's settlement: how our environment was shaped

The first human settlements in England were around the coast and along major river valleys, so that our area long remained primeval "wild wood", but even by Neolithic times settlements were established on hill-tops with relics of hill-forts at the highest points of the Chilterns escarpment, and burial mounds (eg Oaken Grove, Hampden). These peoples would have hunted animals such as boar, bear, wild ox (aurochs) and deer, but their footprint in our area was very light, with the odd flint axe and scraper providing only scrappy evidence of their residence here. Even the hill-forts were deserted with the advent of the Romans, who preferred the well-watered valleys for their villas at Little Missenden, Hughenden and Wycombe. (The age of the mysterious Grim's Ditch, which passes through Hampden to the edge of Prestwood and again appears across the Missenden valley towards The Lee, is unknown, but certainly it seems to have lost all meaning by Anglo-Saxon times, probably marking the boundary of some ancient Celtic hill-tribe.) Outlying farms were sited near springs that then abounded, for instance, along what is now Hampden Road west of Prestwood (the valley along which this road now runs being then a winterbourne that flowed intermittently most winters). Roman impact on the hill regions was slight, despite a number of finds of late Roman (Byzantine) coins etc in Prestwood, Denner Hill, Potters Row, and other settlements north of Great Missenden, which are probably evidence of Anglo-Saxon commerce after the Romans departed. It was not until the Anglo-Saxon era that real inroads began to be made into our area, as manorial estates were established at Great Missenden, Great Hampden and Hughenden, and cultivation began to spread further up the hills with the felling of a large part of the old forest.

By the time of the Norman invasion there was little wild wood left. The remaining woods, mostly on the hill-tops, were intensively used for timber, firewood, coppice and browsing for animals. Below these was permanent grassland for grazing stock and hay-making, and in the more fertile lower valleys cultivated land for crops. Animals were taken to the grazing lands on a daily basis, being brought back each evening to the shelter and safety (there were still wolves) of stockades close to the settlements, among small orchards and kitchen gardens for herbs and vegetables. Around Great and Little Missenden this led to the creation of innumerable lanes followed by shepherds and cowherds for centuries, wearing deep tracks between high banks, surviving as the characteristic green lanes of today, a major scenic and ecological feature, some of which were eventually metalled, like Hotley Bottom Lane from Hampden Bottom up to Prestwood, or Watchet Lane, others still maintaining much of their original rural character, such as Featherbed Lane to Holmer Green from Little Kingshill, or Boss Lane from Hughenden Valley to Great Kingshill.

Remains of medieval settlements can still be seen at Bury Farm, Rook Wood, Frith Hill, and of course Missenden Abbey, but we know very little about them. In some cases isolated plateau farms were established to keep stock near their food, such as: Denner Hill (Anglo-Saxon *denn* 'swine-pasture') which was then still largely tree-covered, providing acorns etc for pigs; Nanfans (probably the first settlement at Prestwood); Peterley (first cleared and settled by monks from Missenden Abbey); Martins End, Little Kingshill and Grange Farm (all established by the monks). Even in these early medieval times the countryside was far from static, with grazing land alternating with hayland, neglected arable land returning to scrub, woods felled in one part, re-planted in another, cultivated land left to become grassland, grazing land ploughed up, according to the exigencies of changing population and economic needs, a continually changing environment that established the quilt-like scenery of today. A major change in the 14th century was the huge depopulation following the Black Death, when many former agricultural lands were deserted and returned naturally to woodland, some later re-cleared but others remaining wooded to this day. (The lower part of Angling Spring Wood, Great Missenden, was probably farmland in medieval times, but has been continually wooded since.)

The most fertile soils were in the river valleys, arising from a fine silt deposited in winter floods, often manipulated by sluice gates along the stream, as at Great Missenden (the remains of one of which can be seen by the path along the north side of Boug's Meadow), but most of the local soils were relatively poor. The chalk soils are thin, stony, not high in nutrients and low in yield. The clays, on the other hand, are difficult to work and prone to water-logging, which is why most of the woodland was left on the clay plateaux, alternating, near settlements, with heathy commonland where cottagers could water and pasture the odd cow or goat, collect bracken for bedding and furze for firewood. While cleared land was drained by ditches, the plateau woods still contained areas of marsh (such as the centre of Peterley Wood), and would have been far wetter than today.

Apart from the soils for farming, the countryside provided other resources. The sandier clays, such as at Kiln Common, Prestwood, were suitable as brick-earth, giving rise to a brick-making industry as early as the 15th century, which lasted until the Second World War. In places the clays held nodules of iron-rich ore that were excavated and smelted *in situ* using the wealth of wood around for fuel. (One such site, probably medieval, has been found in Peterley Wood, while slag from a similar site in Piggotts Wood has been dated back to the Iron Age.) This was a small-scale industry probably for home consumption alone. The clays also had many hard concretions of sarsen, known locally as Denner Hill stone, suitable for hard-wearing construction such as pavements, but it was probably not until the 18th and 19th centuries that the skills for finding and working them were sufficiently developed. Chalk-rock, a particularly hard chalk that runs in a thin band just below the tops of all the chalk hills, was also quarried for building-stone, especially barn floors where its permeability helped remove excess liquid. The old timber in the woodlands was jealously guarded by owners for its high value for ship-building etc. Thus commoners' rights included cutting brushwood but there were harsh fines (or worse) for anyone cutting down mature trees. The regular international wars of the middle of the second millennium led to the demise of virtually all our old woodland oaks, only particular "landmark" trees in hedge-rows and field corners surviving. The beech was particularly suitable for furniture and at the height of the Wycombe furniture industry in the 19th and early 20th centuries most of our local woodlands were converted to beech monocultures. All these woods still contain the remnants of saw-pits used by "bodgers" who camped out with their families in the woods each summer to turn chair-legs on crude lathes. While these "pure" beechwoods have become an accepted, and even celebrated, part of the Chiltern scenery, they are in fact artificial, recent and ecologically poor.

The 16th and 17th centuries saw the rise of a local aristocracy based on the major country estates, with wealth enough to be leisured and interested in ostentation. This was the main era of the development of parkland at Great Hampden, Hughenden and Missenden Abbey. Former productive farmlands were converted to parklands with isolated trees, usually chosen for their exotic origins, non-native species like common lime, sycamore, horse- and sweet- chestnut, walnut, London plane and Turkey oak. Grand avenues of such trees were planted to create imposing carriage-routes to their manor-houses and vistas to impress their guests. This new landscape element has survived to today and provides home to some of our oldest trees, fortunately including a few native oaks, ash and beech among their number.

The major change in the local landscape in the late 18th to mid-19th centuries was the enclosure of the commons (vituperatively referred to in legal documents as "waste"). This change was led by the rich gentry who had an eye on the then high wheat prices and greedily looked to increase their land-holdings. Not only did this destroy locally virtually every remnant of the old heathlands and the whole ecology associated with it (gone the heather, the heath violet, most of the gorse and harebells), but it also destroyed the ability of poor cottagers to live off the land, their rights to pasture and simple foraging removed at one sweep by Parliamentary act. This led to rural depopulation of the labouring class (not without their protests and riots, for which many were deported) and

a shift of population to the towns and cities to fuel the industrial revolution. And within decades the price of wheat fell and the ploughed-up commons, irretrievably destroyed, provided only poor farmland - so poor that they were soon sold off when the building boom of the mid-20th century presented another opportunity of profit to landowners. Heathland is now our rarest habitat and the ecology associated with it extinct. A few commons survive in nearby parts of the Chilterns (eg Naphill and Hyde Heath), although, having lost their original function and day-to-day management, they are sadly degraded.

For most of the history of our area Prestwood was somewhat a backwater in terms of the surrounding region, relations generally limited to neighbouring villages, and even the then grand Peterley House (it later burned down and was rebuilt in the current uninspiring manner) was rarely occupied by its noble owners, the Dormers, and continually let to a sequence of rather lesser gentry. The main communication routes were the London Road from Wendover through Great Missenden and the road from Hughenden south to High (Chepping) Wycombe. This left the plateau lands isolated, with one exception, which bore no comparison to the procession of carriages and stage-coaches along the main roads. This was the old drove road used by farmers taking stock on foot and hoof to sell in London or other towns along the way. This road ran from the north (ultimately from the Midlands) through Prestwood, passing through both Kiln and Prestwood Commons, and must have at least been a major source of trade for the series of inns that appears on its route, from Chequers eastwards to Martins End (and thus Great Missenden) and south to Wycombe past the Polecat, King's Head, Red Lion and Royal Oak (the last now demolished). At Kiln Common the road passed right beside the Sheepwash pond, where dust and briars were washed from the wool of sheep to make them more presentable at market. This pond was recently restored by Prestwood Nature, having lain neglected for a hundred years since it was last used for its original purpose in around 1900.

It was the main route through Great Missenden that did most to transform the area at the end of the 19th century, when the railway reached there from London. Not only did this lead to considerable gentrification of Great Missenden, which still has a completely different character from Prestwood and vastly more facilities, though far smaller, but it made for a minor revolution in agriculture. The small orchards attached to every farm suddenly changed from being merely for domestic consumption to being a real commercial proposition, because the speed of rail, compared to carriage on the still atrocious roads, enabled fresh fruit to be taken to the heart of the metropolis, and later to the Midlands. By 1950 Prestwood was like one gigantic cherry orchard, with outings arranged from London for tourists to enjoy the spring blossom. Similar large orchards sprang up at Hughenden, Little Kingshill and Holmer Green, some specialising in apples, others in cherries or a mixture of fruits including pears and plums. The bottom fell out of the market in the middle of the 20th century with the advent of refrigeration, and the orchards, which in Prestwood mostly occupied the fields that replaced the commons, were mainly sold for the major building expansion of the 1960s-1980s. Then Prestwood lost its character of rural village, for which farming was the core of its existence and the source of most people's livelihood, and became a dormitory suburb for people who originated elsewhere, worked elsewhere and had no connection with the locality or the land. From a tributary hamlet of Great Missenden, Prestwood became by far the largest settlement in the region (2,300 households) - strangely a change that was paralleled by the gradual loss of local shops and facilities, rather than an increase in proportion to the new population.

The environment today

(a) The land and its natural communities

The landscape outside the major settlements is dominated by woods and farmland of a mixed agricultural type, typical of the Chilterns. This landscape, as the outline above of its historical development shows, is one that has essentially been created by man. While none of the habitats can therefore be considered as properly "natural habitats", where there has been relative continuity and stability over time natural communities of plants and wildlife have evolved that are adapted to each of these man-made habitats. These communities today are threatened by rapid change and even the eradication of some of the habitats in which they have evolved, with the potential loss of biodiversity. Up until the 1950s our area lost on average one species of plant per decade (reflecting the expected rate of change from natural evolution and balanced by other native species expanding into the area), but from then on losses have been far greater with five species lost in the 1960s, seven in the 1970s, 18 in the 1980s, and 5 in the 1990s.

The area is bordered by many important conservation areas:

1. to the north-west by the Chiltern escarpment, where there is a series of important nature reserves owned by BBOWT (Berks, Bucks and Oxon Wildlife Trust) and the National Trust,
2. to the south-west by Naphill Common SSSI (an ecologically important area managed by a local group and merging into the National Trust's Bradenham Estate),
3. to the south by the National Trust's Hughenden Estate and BBOWT's Millfield Wood Reserve, and the beginning of the High Wycombe conurbation (Hazlemere, Holmer Green),
4. to the south-east by the extensive Penn Wood, owned by the Woodland Trust,
5. to the east by an ancient landscape of small fields and ancient hedgerows around The Lee, Ballinger etc that extends as far as Chesham.

The Prestwood Nature area forms a buffer area between all these major sites, with potential for wildlife links between them all. It is therefore important for relating disparate conservation areas under different management to one another. As such it has been recognised as a Priority Area under the Bucks County Biodiversity Action Plan.

Sites of importance for nature conservation

i. Priority Areas

The area also includes sites of nature conservation importance in their own right. Two areas that are selected as Priority Areas under the South-east England Biodiversity Action Plan and that lie partially within the Prestwood Nature Area are the Hampden woodlands and the Misbourne valley.

The ancient Hampden woodlands of the Hampden Estate occupy the north-west quarter of the area and from them extend a series of woodlands and chalk grassland sites (in various stages of preservation) south along the dry valleys occupied by the Hampden, Bryants Bottom and Speen Roads. This area occupies the western half of the Prestwood Nature Area and includes most of its most bio-diverse sites and rare species.

The Misbourne river is important as an example of chalk streams, with a special ecology of their own. The Misbourne valley occupies the extreme south-eastern edge of our area and runs from Mobwell, just north of Great Missenden, south-eastwards to Little Missenden. In this part of the river it is subject to disruption of flows, naturally drying up over summer and beginning to flow again in late winter. It suffered a decade of nil flow due to over-abstraction of ground water. While this has now been alleviated, flows are still restricted by a series of low rainfall years (especially over the winters) and subsequently a historically low water-table.

ii. Local Nature Reserve

The Prestwood Nature Area includes no BBOWT reserves, but there is one Local Nature Reserve (Prestwood Picnic Site), owned by Wycombe District Council and managed by Wycombe Rangers in association with Prestwood Nature.

iii. Local Wildlife Sites

There are 34 Local Wildlife Sites, selected by the Wildlife Sites Project, Bucks County Council, as having special importance for nature conservation, most of them privately-owned. These have no statutory protection, but their conservation value must be considered in the event of any planning applications that may affect them.

iv. Biological Notification sites

There are at least another 45 Biological Notification Sites in the process of being considered as LWS.

v. Road Verge Nature Reserves

Six sites were proposed as possible Road Verge Nature Reserves by the County Council before this proposal was shelved. Other road verges could well qualify for similar consideration.

Countryside Stewardship

Several farms have been awarded the old Countryside Stewardship or the contemporary Higher Level Environmental Stewardship, particularly Hampden Bottom Farm (which is also a flagship farm for LEAF, Linking Environment and Farming) and Wren Davis Ltd, which between them account for over 80 fields and several woods. Hampden Bottom Farm includes unsprayed cultivated field edges supporting rare arable annual wildflowers, and both farms have permanent recovering grassland with important plants and insects. The Little Hampden Estate is also creating wildlife-friendly margins and managing its woodlands with advice from FWAG (Farming and Wildlife Advisory Group).

Protection

Most of the land is within the Green Belt and all of it within the Chilterns Area of Outstanding Natural Beauty. Although this does not provide absolute protection, the Chilterns Conservation Board is very active in promoting conservation, especially through such posts as its Farming and Chalk Streams Officers. While there are some trees (and whole woods) with Tree Protection Orders, this system provides hardly any protection and most of the important veteran trees are not covered by TPOs. Prestwood Nature mobilises local volunteers and works with landowners to restore, preserve and improve a continually increasing number of sites, as well as promoting awareness of nature conservation. The Chiltern Society maintains footpaths, encourages building that fits in with the local character, monitors water-flow in the Misbourne, and generally tries to increase awareness of environmental issues. There is a Misbourne Action Group concerned to reinstate regular flows in the whole of the river.

Public lands

A number of scattered sites are owned by public bodies - county, district and parish councils. In many cases, except those sub-let for agriculture, there is public access, as at Abbey Park, Great Missenden (county council), Boug's Meadow, Great Missenden (Chiltern district council, managed by Prestwood Nature), Buryfields (Great Missenden Parish Council), and Kingshill Common (Hughenden Parish Council). Others provide recreation grounds (Prestwood, Great Kingshill, Great Missenden) or allotments, including three at Prestwood and others at Great Kingshill, Ballinger, Naphill, and Spurlands End. In addition, the Countryside and Rights of Way Act 2000 established a

couple of open-access areas - Flowers Bottom at Speen and the field north of Spring Coppice, Bryants Bottom - which are also significant as important wildlife areas. Prestwood Nature has been involved with ecological surveys of many of these sites.

Important habitat types in the area

Farmland still accounts for three-quarters of the landscape in our area. The proportion of arable to pasture has varied considerably over time, but currently about two-thirds of farmland is pasture, which therefore occupies half of the district. Another 15% is occupied by woodlands, and 10% by human settlements.

The bulk of the pastureland is "improved" in agricultural terms, ie has been fertilised to encourage the growth of grasses nutritious to stock, and has low frequencies of flowering plants of a limited number of species (largely dandelion and buttercups). Little is cut for hay, which has largely been replaced by silage, where the grass is cut while still green and flowers have not set seed, which again reduces the diversity of species. A significant proportion of pasture has recently been replaced by horse paddocks, for which there is considerable demand from a growing leisure industry of horse-riding. Such paddocks are generally particularly low in biodiversity.

Most woodland in the area is formally "semi-ancient", but because of the slump in demand for timber and other woodland products, most have become neglected and have lost a lot of their environmental value. Some woodlands are used for rearing game-birds for shooting syndicates and these are particularly depauperate.

Areas of human settlement are not devoid of environmental value. A large part (about a half) is occupied by gardens, which vary considerably in their biodiversity according to how they are used and managed. Allotments, which are usually close to housing, have a role in supporting wild arable annual plants displaced from intensively managed farmland. There are often interstitial green spaces between housing that are particularly valuable in relieving the monotony of the built environment and can support ecological communities, although these are considerably affected by the intensity of human use. Buildings themselves are of value for a few species of wildlife - such as swallows, house martins and swifts that build their nests under eaves, and barn owls and bats that may find roosting and nesting sites in the roofs of old buildings. Other "invaders" of our living space, such as fat dormice and grey squirrels, are usually less welcome.

The following habitats were once characteristic of the area but are now endangered because of changes in land-use:

(1) *Common land* (acid grassland and heath with gorse scrub) - virtually extinct with no good surviving examples.

(2) *Chalk streams* - two such streams arise in the area; both suffer from low flows resulting from a lowered water-table.

(3) *Chalk grassland* - just a few moderately good examples, but most of these are in serious decline and reversion to scrub; the best examples are those that survive over the harder chalk-rock.

(4) *Hay meadows* - largely replaced by cutting for silage, so that flowery long-grass meadows, cut late in the year, are a thing mainly of the past; these flowery meadows supported huge communities of butterflies, bees and other insects, and early-flowering orchids now rare or extinct locally.

(5) *Arable land* - once supported a range of annual native plants, but most of these are now rare and endangered or even extinct because of modern chemicals; a few communities survive on unsprayed cultivated field margins and allotments.

(6) *Orchards* - a few survive along with fragments of many others. Only one is in active conservation (Collings Hanger) but there are plans to restore others (eg Andlows, Old Orchard); by far the largest is the Old Orchard, Little Kingshill. All orchard remnants in the area (virtually all on private land) were surveyed by Prestwood Nature in 2010 in association with the national orchard survey sponsored by Natural England. The hard

winter of 2009-10 saw the start of major muntjac damage of orchard trees, as other forage became difficult to find.

(7) *Ponds* - most in poor condition. There are about 100 ponds still existing in the area. All are in the process of being surveyed by Prestwood Nature.

(8) *Ancient trees* - veteran trees can each support a unique ecological community of its own; there are few trees in the area over 300 years in age. A complete survey by Prestwood Nature is proceeding.

(9) *Semi-ancient woodland* - due to a mixture of clear-felling in the past and recent neglect, hardly any of our woodlands, despite being common and of long-standing, contain really good examples of ancient woodland flora and fauna communities, and most are in decline. The beechwoods, often seen as a quintessential Chiltern feature, are a human artefact of the late 18th century; as these monocultures decline it will be better to encourage a mixture of species that would have been typical of the area over many more centuries. Grey squirrels, muntjac and roe deer (all introduced species) have become major pests and are having an increasingly deleterious effect on the regeneration of woodlands.

(10) *Churchyards* - non-intensive management has left many as rare oases for wildlife with many uncommon species.

In addition, the following are important because they provide interstitial wildlife habitats that provide connections between wildlife areas. They often contain the only survivals of ecological communities that were once more extensive:

(11) *Hedgerows*

(12) *Road verges and green lanes*

(13) *Streams.*

Lastly, there are ecological communities, often very changeable and temporary, that arise, and depend, on

(14) *Disturbed ground*, usually in association with human settlement or industrial sites.

(b) Air quality

Within close proximity to London, the Chilterns in the past suffered from high levels of air-borne industrial pollution. While increasing regulation of emissions has reduced these levels, there is still a rising effect from increasing motor traffic and the release of carbon dioxide from numerous activities. Most of the lichens (a good indicator of air quality) in our area are common species that are adapted to high levels of pollution and nutrification (high levels of nitrogen and phosphorus). A few plants benefit from nutrification - such as stinging nettle, broad-leaved dock, cleavers (or goosegrass) and cow parsley - and these are expanding their populations at the expense of other native species, thus reducing biodiversity. All plants absorb carbon dioxide and are important to reducing the "greenhouse effect", and trees, especially mature old ones, given their size, make a particularly important contribution. Fungi also absorb pollutants from the air.

(c) Soil conservation

Most air-borne pollution, along with rainwater, is eventually absorbed in the soil, especially where there is a dense turf held together by plant roots and aerated by worms and other invertebrates. Arable land, like built environments, is poor at holding water, which therefore tends to run away before it can be used by natural species, including man. (There is a current argument in "green" circles in favour of growing more crops and eliminating animal husbandry, because farm stock release high levels of methane into the atmosphere. Such a move would, however, remove all the natural grassland eco-communities and large areas of cultivated land would cause problems of run-off. This is probably an instance where a balance is preferable to either extreme.) High levels of pesticide and fertiliser on arable land not only destroy soil eco-

communities (as large and important as those on the surface of the land, although entirely invisible), but can also leach into water-courses and water-tables. Countryside Stewardship conditions seek to prevent use of such chemicals in water catchment areas. Organic farming avoids the use of dangerous chemicals altogether, although it is difficult to farm organically while keeping up the high yields necessary in today's economic climate and with supermarket uniformity demands. Shallow-ploughing (as practised for instance by Ian Waller at Hampden Bottom Farm) is the most effective way of maintaining soil quality and both pollution and water-absorption.

(d) Water quality and conservation

While there is no particular issue in terms of water-pollution in this area (as there are no major rivers), over-extraction in the past heavily damaged the Misbourne stream (being among the top 25 rivers in the UK most affected in this way). From its main origin at Mobwell north of Great Missenden to Little Missenden, it ceased to flow altogether for ten years, destroying important aquatic eco-communities. Reductions in extraction have since allowed the stream to flow more regularly, although not every winter as it did in the past. The water-table is lower than formerly because of increased building and lower levels of rainfall in recent decades, which affects the chalk springs that give rise to the Misbourne and also many ponds in the area. The Misbourne is a winterbourne, which traditionally flowed in the winter and spring and gradually dried up in the summer. The plants and creatures that lived in this habitat were adapted to this change and able to survive this annual transition, but only insofar as the revival of flow in the winter was reliable. Fluctuating flows can cause problems in built-up environments. At its maximum flow the Misbourne can flood the neighbouring fields - a fact that was used to advantage in previous centuries because of the fine silt that was deposited in the meadows, improving their quality (a series of higher banks and ditch systems for controlling flows, can still be seen in the fields south of the Black Horse). When the neighbouring land is a car-park or other space used by humans, such floods cause problems. This is particularly so in the Buryfield, Great Missenden, where the river has been constrained within underground culverts too restricted to cope with the maximum flows.

(e) Noise and light pollution

While the Chilterns promotes an image as "peaceful" countryside, the fact is that a continual background drone of traffic, both road and air, is impossible to avoid in our area. The proposal for a high-frequency rail route across the Chilterns (currently to run right through the Great Missenden Parish) would increase even further this level of noise pollution.

Light pollution reduces the visibility of the night sky and appreciation of its constellations, and can disturb certain creatures adapted to darkness. The most affected of the latter are probably the glow-worms, whose populations have declined locally, probably because the males are attracted to human light sources instead of those emitted by the females. Moths are also attracted to street-lights, which disrupts their feeding and breeding activity. The problem is not, however, a major one in our area, where the number of street-lights is very small. Security lights can be a problem if they intrude into neighbouring green spaces and disrupt animal activity there.

(f) Human heritage

There are features of the environment that are valued by its residents and visitors. These include relics of the past (eg barrows, old buildings, traditional orchards, bank-and-ditch boundaries, laid hedgerows, and woodland archaeological features like old saw-pits) and the admired scenery with small patches of different agricultural land-use, hills and valleys. As an Area of Outstanding Natural Beauty it is important that this heritage

be preserved, although on scientific grounds there is no association with the quality of the environment per se. Valuing the scenery and the past, however, does lead to greater appreciation of the role of natural communities in maintaining them and thus indirectly to the maintenance of environmental quality. There is nevertheless a conflict between human appreciation of a particular environment and its conservation, if this appreciation leads to higher levels of human settlement, higher house prices leading to unbalanced communities, higher levels of tourism, and higher levels of leisure use of the countryside, all of which may damage the character that was initially valued. A balance needs to be struck between local economic development and the needs of an environment that has been increasingly marginalised and is now highly sensitive to further impact.

(g) Climate change

Climate has never been stable and there have been times in the last thousand years when the climate has been hotter and colder than it is now. In the last few decades there has been evidence of global warming, but there is uncertainty about whether this is part of a continuing trend, how far it is due to man's interference with the atmosphere, and what local impacts are likely to be. The general consensus among scientists is that there is an effect driven by man's economic activity and that more extreme weather events and overall warming can be expected to increase, but there are some scientists (and some evidence) that would disagree. We shall only really know the truth for certain after the event - when it is too late if, as some forecast, we are headed for ecological disaster. As the effect locally cannot be forecast (even with global warming, in this particular area we might face colder winters and wetter summers), it is impossible to plan for climate change. We do know, however, that gases released by human industry, transport and farming are changing the atmosphere and this change is not beneficial, so that it is sensible to minimise these impacts by the way we live our lives (less use of cars and aeroplanes, recycling, economising on water and fuel, buying local foods and products). These would all have environmental benefits, whatever happens to the world climate. It is also sensible to bear in mind that extreme weather events are always possible (whatever the general trend which at the moment seems to be towards greater frequency) and to plan accordingly - by, not instance, building on low ground close to rivers. The general warming in this area that has occurred over the last few decades has resulted in the migration of creatures, especially insects, into this area that were previously restricted to warmer districts, some of them becoming common, such as Roesel's bush cricket, median wasp, harlequin ladybird, tree bumble-bee, and horse-chestnut leaf-miner, while average dates for first flowering and first advent of summer visitor birds have gradually got earlier. This reinforces the need for linking important wildlife sites by natural corridors (ie wildlife-friendly habitats) to enable species of all kinds to move easily to find the temperature conditions they need as their habitats change.

How we can maintain and improve our environment

(a) Eco-communities

Intensive agriculture, driven by economic forces and scientific advances, has radically decreased the area of countryside in which natural communities can thrive. It is therefore important that those areas where such communities currently exist are preserved and managed to maintain or increase their biodiversity. Prestwood Nature carries out regular surveys of different habitats and tries to ensure that those that still have some natural integrity are preserved, by negotiation with and assistance to landowners, and by mobilising volunteer effort. In doing so it has benefited from the support of parish, district and county councils, the Chilterns Conservation Board, and other bodies. Continued cooperation is essential to future success. Efforts need to be continued to publicise the needs of environmental conservation and the responsibility of each resident in this respect. These efforts need to be made continually because of the high turnover of population in the area. Schools should be encouraged to engage their pupils in conservation, both on school grounds and in the wider area. Parish, district and county newsletters delivered to all households should feature environmental issues much more extensively than they do now, where "environment" tends to come down to just recycling and traffic control.

1 Common land.

With no viable heather communities left, the only option is replanting with heather if a suitable site can be found on acid soil. Prestwood Nature is making small trials of heathland restoration on two small sites, but a site of reasonable extent where the owner is sympathetic has yet to be found. Margins of current relics of old commons now used as playing-fields might have potential for heathland creation, without encroaching on playing areas.

2 Chalk streams.

In consultations on water extraction, all bodies should press for reduced extraction from the Mobwell region. Conservation of waterside meadows south from the Mobwell towards Little Missenden should be a priority, linking the management of neighbouring fields. This is one of Prestwood Nature's priority "corridors". Improving flow underneath Buryfield would be beneficial, but there would seem no way of enlarging the current culverts. The only other option would be to deflect the course of the river around the edge of Buryfield and to return to surface flow, which would itself have public amenity value. Although several parties have suggested this, it is likely that the cost would be prohibitive.

3 Chalk grassland.

Several sites are already subject to conservation management. Other sites exist but are deteriorating because of the lack of interest of owners. This includes a series of fields on the west side of Denner Hill.

4 Hay meadows.

Hardly any hay meadows now survive in the area, although Prestwood Nature are reseeding a few areas (Boug's Meadow, Kiln Common Orchard) and some private landowners are also re-establishing appropriate management on their property to good effect. Areas of public land not used for recreation could be considered for similar management in favour of flowers, butterflies and bees. The benefits of properly managed long-grass areas over short-turf "lawns" should be publicised, and interested landowners supported with advice (as Prestwood Nature is attempting to do). Ideal meadow management is a single cut in later summer (or whenever the flowering plants present have had a chance to seed), removing the cuttings. Plants will gradually move into such an area, but the process can be speeded up by initially scarifying the existing turf and sowing a wildflower meadow mix from a supplier who can guarantee British origin. Bulbs of wild daffodil, bluebell, snowdrop, etc can also be planted to add springtime interest.

5 Arable land.

Unsprayed cultivated field margins on arable farmland should be promoted - even a 2 metre wide strip around each field would increase the area available to native annual plants very considerably. Pesticides should be used sparingly - Integrated Pest Management, as recommended by LEAF (Linking Environment and Farming) and Plantlife, minimises use of chemicals by proper targeting, whether on farms or in private gardens. The coming EU Directive on Sustainable Use of Pesticides will require even greater regulation in future. Owners of allotments should be encouraged to allow smaller "weeds" like fumitory, small toadflax and corn spurrey to share the space used by crops, as allotments have been found to support a significant number of uncommon native annuals. Gardeners should similarly be encouraged not to weed too assiduously between crops, except for vigorous plants and those that spread quickly: discrimination rather than blanket destruction of all natural life-forms.

6 Orchards.

Owners of remnants of old orchards should be encouraged to preserve them, leaving dead wood in situ as an important wildlife habitat, and planting new trees to replace those that will eventually die. The planting of new orchards (which can be done in conjunction with hay meadow creation) should also be encouraged. While small orchards will necessarily use dwarfing stock, full-grown orchard trees are feasible in larger fields and will be more beneficial to wildlife. Orchard owners should also be encouraged to plant endangered old local fruit varieties where commercial fruit production is not being considered. There are several suppliers of such varieties and Prestwood Nature can supply details.

7 Ponds.

Derelict ponds that show signs of being able to maintain water for a good part of the year may be worth restoring. The cost (from £100 to £5000 or more) will depend on size, the extent of dredging necessary, and whether shading trees need to be taken out. A good pond supports a vast amount of wildlife and can be scenically attractive. Ponds should not be stocked with fish, which destroy most other creatures. Fish are not a natural component of isolated ponds. People should be discouraged from feeding ducks, which attracts excessive numbers that devastate the flora and fauna of a pond. (An example of where this has created a very ugly and lifeless pond is the one in the centre of Holmer Green.) Where it is not worth restoring a pond in a residential area, planting of reeds should be undertaken so that it will act as a pollution-extractor from road run-off.

8 Ancient trees.

There are hundreds of trees (especially oaks) in the area that are over 200 years old. They are mostly in hedgerows, along roadsides, and in parkland. Very few woods have ancient trees except sometimes along the margins. All trees over 2 metres girth (at chest height) should be preserved, even if they show signs of deterioration, for the wildlife they support, as long as there are no safety implications. Even in the latter case, the problem can usually be dealt with by removing selected boughs. Even dead trees should be left standing if possible. Where large trees are close to housing it can be difficult to preserve them, as residents may worry about windfall and roots disturbing foundations. Such trees are also likely to suffer from drought. Nevertheless, such trees are an important amenity, for residents and wildlife, and should be preserved if at all possible. An example is the line of trees, mostly oak, along Westrick Walk on the Lovell Estate in Prestwood. This used to mark the edge of Prestwood Common, the trees being relics of the former hedgerow. Underneath them in autumn grow many rare species of fungus which depend upon the trees. They also provide a pleasant green walk across the area.

9 Semi-ancient woodland.

Angling Spring Wood is currently improving with new management by Prestwood Nature and the Chiltern Woodlands Project. Many other woodlands are receiving careful management. Priorities for Prestwood Nature on the basis of wildlife (including dormice

and white-letter hairstreak butterflies) are Longfield and Hatches Woods, part of a series of woodlands (including Nanfan Wood, already designated a Local Wildlife Site) along the Hampden Road Valley and connecting with the important Hampden woodlands. Further south are other important woodlands in the vicinity of Pipers School and Boss Lane. Some woodlands (Pepperboxes, Chalkdell, and Gomms) are managed by the Woodland Trust. Woodlands should be managed to preserve their archaeological interest as well as wildlife. Woodlands neighbouring housing often suffer from the dumping of garden waste "over the fence", which causes nutrification, the spread of nettles and loss of other plants: the authorities need to take action where this is occurring. Ancient woodlands have a sensitive soil structure with fungal mycelia, invertebrates and uncommon plants. Management of woodlands should be carried out with a minimum amount of damage to the ground layer, avoiding heavy vehicles. Similarly, motorised vehicles and horses should be excluded from woods, except, in the latter instance where there are bridleways.

10 Churchyards.

Prestwood Nature already advises on the management of some churchyards. These are important for relic habitats such as heathland, short and long grassland, etc. Most have not been fertilised like pasture and have had minimal disturbance (if one omits grave-digging). With graded frequency of grass-cutting and removal of cuttings, some marginal wild areas, etc, churchyards can be treasure-houses for wildlife as well as pleasant places for human contemplation. Mowing should be discontinued from late August to the end of October to allow fungi to "fruit" and flourish, as most churchyards are home to rare species that are rarely allowed to raise their heads because of the rampant mower. Nor do the mower blades need be set so low as to scalp the turf every time.

11 Hedgerows.

With large areas of land - improved pasture, chemically-treated arable, and residential areas - uncongenial to wildlife, hedgerows have become crucial habitats and highways for wild plants and creatures, providing a network of semi-natural habitat across the whole area. Maintenance of these hedgerows is crucial to conservation of the countryside. They are particularly important for dormice to travel between woodlands, as recognised in the western part of our area being designated as a priority area in the national Hedgerows for Dormice Project. They are also the main habitat these days for decreasing woodland plants like moschatel, green hellebore and toothwort. Hedgerows should be maintained as dense structures, with gaps (except gateways) filled by replanting, preferably laid as in the past (although the cost of labour for this these days tends to be prohibitive), and cut only once in three years (ideally alternating each year between cutting one side, then the other, then the top). Annual cutting of hedgerows destroys the fruit on which dormice and other creatures depend. Annual cutting, however, tends to be popular with farmers and contractors because it prevents thick branches forming and makes cutting easier. In each hedgerow it is beneficial for there to be one tree allowed to grow tall in each 30 metres. These taller trees provide habitats for bats and birds (and, in the case of oaks, purple hairstreak butterfly), and they also provide the ancient trees of the future. The vegetation beside each hedge, up to at least 2 metres, should be left uncut, except once a year, to allow scrub and long grass to provide extra cover for wildlife. Spraying of fields should avoid encroaching on these field margins.

12 Road verges and green lanes.

These habitats, like hedgerows, also provide corridors for wildlife - indeed they will usually include hedgerows, often ancient. Green lanes preserve the vegetated banks important for many plants like primrose and violet, whereas surfaced roads for motor vehicles have often been widened to such an extent that the road reaches right up to the hedgerow on each side, as can be seen to have happened recently along Whitefield Lane as it rises from Great Missenden to Angling Spring Farm (formerly View Cottage), where colonies of orpine and moschatel have been virtually eliminated by removal of the

banks. Leopardsbane was similarly destroyed by the widening of Perks Lane. The maintenance of roads has always taken scant regard of the needs of natural habitats, and contractors, whether widening roads, taking out hedgerows to improve visibility of traffic, or cutting verges, have no knowledge of what they are destroying. Highways departments should seek advice on whether there is any conservation interest before undertaking any maintenance of roadsides. Prestwood Nature intends in 2011 to carry out a systematic survey of road verges, but an earlier proposal from the Countryside Section at the County Council for roadside nature reserves (present in virtually every other county in Britain) received short shrift from the Highways Department. Prestwood Nature already has knowledge of numerous important verges in its area and it is essential that this is incorporated in maintenance plans. Timing of cutting is important, varying with the particular plants present, and cuttings must be taken away to avoid the build-up of nutrients and colonisation of verges by the likes of stinging-nettle and dock. At the moment neither of these is taken into consideration.

While road verges can be wildlife corridors, roads themselves can be barriers to wildlife. In cases where this is a problem measures such as mammal fencing; underpasses for badgers, hedgehogs and amphibians; and green bridges for both wildlife and people; should be considered. These can, however, be costly and limited in effectiveness if not adequately planned, so that these measures are easier to apply at the time of new road creation.

13 Horse paddocks.

The Natural England leaflet "Horses, grasslands and nature conservation" shows how horse-grazed grasslands can be managed so as not to lose their natural biodiversity. Horse-farms and individual owners should be encouraged to adopt these ideas.

14 Disturbed land and built environments.

While there is a suite of plants and invertebrates dependent on disturbed land ("wasteland"), it is difficult to plan for their conservation, because it is in the nature of such land to be temporary and continually shifting. Wasteland that is left for too long becomes dense scrub of limited value. Species that use such habitats are adapted to the need for constant dispersal (eg wind-carried seeds) and they must look after themselves. Man can help, however, by not being over-tidy in the management of residential and industrial areas, leaving the odd pile of rubble or sticks and trampled ground. Green corridors should be provided at regular intervals in all residential areas and should be incorporated into building plans. They are important for human leisure needs as well as wildlife. While regularly walked routes and play-areas should have frequently-cut short grass, there are usually odd corners and fringes where grass does not need to be cut other than once a year to allow wildflowers to flourish. This area (especially Prestwood) is notable for the number of rare toadstools produced in late summer and autumn, including the Red Data Book Devil's Bolete and many waxcaps, but these are regularly mown as soon as they appear. Mowing should be discontinued between late August and the end of October to allow these species to multiply, as in the case of churchyards above.

15 Building plans.

Considerations for building plans from an environmental perspective include:

- (i) Landscaping incorporating a variety of green spaces, avoiding the recent tendency towards high density housing by building over gardens
- (ii) Tree and shrub planting limited to native species of British origin
- (iii) Nesting and roosting sites incorporated into architectural designs - eg bat and swift bricks; nest boxes mounted on outside walls; green/brown roofs for birds, plants and invertebrates
- (iv) Preservation of any extant natural features such as hedgerows, mature trees, ponds
- (v) Incorporation of water conservation features, such as ditches draining into ponds, encouragement of reduced water consumption by householders (eg water meters), and grey water systems incorporated into building design (eg for collecting rainwater to flush toilets)

- (vi) Grassland seeding including wildflower seed (again of British origin) in areas that are to be cut less frequently; bulbs planted - eg roadsides - should similarly be of native species and local origin (eg wild daffodils rather than sterile Dutch hybrids)
- (vii) Prohibition on pesticide use in all conservation and public areas (with exemptions for specific problems, such as the need to control Japanese knotweed)
- (viii) Where street-lights are necessary it is important they be shielded to prevent light "escaping" upwards and by using low-power sources
- (ix) Having regard for the surrounding green spaces that will be impacted by increased human pressure from new housing, taking measures to protect the most important natural features and preventing fouling by dogs; similarly the scale of developments should be consonant with the need for adequate recreational space
- (x) Design features should blend into the current landscape, wherever possible, although innovative "green architecture" features such as solar panels and green roofs should override these concerns - the built landscape is an evolving feature and does not have to be lodged entirely in the past, as long as unattractive incongruities are avoided
- (xi) New roads which cross likely regular mammal and amphibian routes should incorporate features such as mammal fencing, underpasses and green bridges.

16 Local authorities.

- (i) Councils should encourage residents to garden in a wildlife-friendly manner by providing information on pond-construction, plants to avoid, planning for a variety of habitats and specific provision for creatures, such as "bee-hotels" and bird-feeders
- (ii) Councils should provide easily-accessible waste-disposal facilities, especially for green waste, and taking action against householders who dump garden rubbish into nearby green spaces
- (iii) All authorities should encourage residents to use cars and aeroplanes less frequently, recycle waste, economise on water and fuel, and buy local foods and products. They should also provide the information and support facilities that will encourage residents to do so.

**Prestwood Nature
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