

BBOWT Wild Oxford Project

Report on the first year 2014-2015

Dr Judith A Webb

Ecological Consultant
2 Dorchester Court
Blenheim Road
Kidlington
Oxon OX5 2JT

Website: <http://judithwebb.weebly.com/>

Chilswell Valley



*Chilswell Valley today. A view looking down the valley from the west end, over the south-east-facing limestone grassland, 18.04.2014.
A similar view to historic photograph on page 3*

Contents

	Page
Introduction and Background	1
Historical and Current Management	3
Habitats and Species at Chilswell today	6
Limestone grassland	6
Alkaline Fen	8
Stream and banks	9
Scrub on wet and dry soil	10
Old hedge line at top of north side above limestone grassland	10
Valley-side copse woodland	11
<i>Figure 1: Sketch map indicating the juxtaposition of the various habitat types in the valley before the start of the Wild Oxford Project work</i>	14
BBOWT Wild Oxford Project	
A. Alkaline fen restoration	15
B. Limestone grassland area extension	15
C. Restoration of the ancient woodland on the NE-facing limestone banks	16
Results of the first year of the BBOWT Wild Oxford Project work, spring 2014 to spring 2015	16
Alkaline Fen work	16
<i>Figure 2: Sketch map of reed-dominated fen showing the proportion cut and raked in 2014</i>	19
Limestone grassland area work	23
Chilswell Copse woodland and scrub areas work	25
Summary and Conclusions	26
Acknowledgements	27
References	27
Appendix I: Historical information on plant species records for the Chilswell Valley	28
Appendix II: Examples of notable/important wildlife already recorded for the site from previous surveys	30
Appendix III: Full Species record data accumulated by J A Webb in surveys in the Chilswell Valley from 2008 to 2015 (<i>separate document</i>)	

Introduction and Background

This valley is but one of the past so-called '**Hinksey Ravines**' (Church, 1922) or long, narrow, deeply incised gorges (3 in total), which all run more or less from the high ground of Boar's Hill on the west down to the Thames floodplain in the east. In the past these valleys were known by names indicating their use such as 'Rifle Range Valley/Ravine' or 'Rifle Range Butts'. One of the oldest references to these valleys is to the '**Bogs on the west side of Oxford**' (Bobart, mentioned in Druce, 1897) when referring to the wetland plants to be found in each of the valley ravines. There are several versions of the Chilswell name and explanations for it. These and certain important historical botanical references to the site are in **Appendix 1**.

The valley has been formed by the central stream cutting down into the rocks of the Jurassic Corallian limestone and sandstone. It is 1km long by 200m wide, about 8 hectares in total area, and is located 500m to the west of the Oxford ring road (A34). The top of the valley side is 25m above the stream in the bottom. The valley is more steep-sided and deeper at the western end than the eastern end and is continued up above the Kimmeridge clay at Chilswell Farm to the acid Greensand on the top of Boar's Hill. The stream running through the valley rises close to Chilswell Farm and after running through the mid-section of limestone geology, it cuts down through Lower Corallian clay and Oxford clay in its bottom reaches, onto more level ground at the eastern end.

The steep slopes of the ravine prevented ploughing for agriculture, as did the swampy, peaty, bottom of the valley. All the more level ground was easily converted to arable and the surrounding area was, in the past, cultivated right up to the edge of the ravine. In the recent past Chilswell Valley was a long thin island of valuable wildlife habitats within a 'sea' of improved, mostly arable, farmland. Since then, arable to the south is now pasture and arable to the north, since 2006, is now permanent grass of the Hinksey Heights golf course. The arable field to the north east of the lower portion of the valley, running up alongside the reserve, contains a valuable portion of what may have started as 'set-aside' at its upslope end. Here a good variety of 'weed' species, combined with invading limestone grassland plant species, provide an important feeding area for birds and insects, which forms a contrasting habitat to the more permanent habitats within the reserve.

This valley in South Hinksey Parish was donated to Oxford City Council (OCC) by deed of gift in autumn 1937 by the 'Oxford Trust', which was a forerunner of the current Oxford Preservation Trust. A condition of the deed of gift is that '**The land be dedicated permanently as public open space**'. The part now so managed by Oxford City Council (OCC) is 6.3 hectares and most of it is recognised of county importance for wildlife by the designation of most of the valley as a Local Wildlife Site – referred to as '**Chilswell Valley and Copse, 50B02**' by Thames Valley Environmental Records Centre (TVERC). The LWS centre is SP508035.

The remaining undesignated portion of the lower valley adjacent to the stream, called here and in the records in Appendix 3, the 'Lower Field', is currently outside the LWS designated area, being owned by South Hinksey Parish Council but now rented by a local farmer. It has been in set-aside and has had little management, resulting in the development of wildlife interest.

Chilswell valley is well named locally as 'Happy Valley', as for a wildlife enthusiast it has small areas of nearly everything – dry flowery limestone grassland with steep south-facing and north-facing sections, ancient woodland of oak and hazel on steep limestone, rare calcareous, alkaline, tufa-forming fen with reed on peat and a tufa-forming stream.

At the lower end of the valley ungrazed, damp, rank, tussocky grassland of the Lower Field on more neutral soil contrasts with the short, drier, alkaline limestone grassland higher up.

All habitats are close together in a mosaic and animals benefit from being able to move easily from one to the other to fulfil their life cycle needs. For example, flies known to breed in the wet fen are to be found nectaring on the flowers in the hot, dry, grassland adjacent.

Access is from the southwest side of the A34 along the road to the Garden Centre known as Chilswell Path. From this road a public footpath branches off travelling south-west up the valley between houses and gardens and then up the northwest side of the reserve, running eventually along the top of the ravine between the highest point of the south-east-facing limestone grassland slopes and a very old hedge line, which separates the reserve from Hinksey Heights golf course.

Walking is facilitated by a mown path through the grasslands and a boardwalk through the fen. This allows a pleasant circular walk, which takes in all the site has to offer. Occasional seats at the top of the south-east-facing limestone grassland enable walkers to pause to enjoy the peace, the attractive views and perhaps watch the numerous butterflies on the grassland slopes below in the summer months.

Higher ground to either side of the valley ravine is currently under permanent grazed grassland or mown grassland in the case of the Hinksey Heights golf course, or arable cultivation.

Early botanists based in Oxford in the 17th, 18th and 19th century found the valley a fruitful site for excursions to find interesting plants. A summary of historical names for the site and historical plant records from published sources is presented for interest in **Appendix 1**. From these records it is apparent that a much more diverse flora used to be present in the valley, with such treasures as marsh violet, fragrant orchid, burnt-tip orchid, yellow star of Bethlehem and some sedges now very uncommon in the county. The importance of such historical information is that it provides a picture of past species' diversity and habitats, which might, to some degree, be restored with improved management. Plant species with a long-lived seed bank might not be actually lost from the site and might be encouraged to recur with soil disturbance and the removal of shading vegetation.

I am very grateful to all the people who have supplied me with results of previous surveys and species records to inform this report, including South Hinksey Parish Council and members of Butterfly Conservation. I am also grateful for access to OCC archive records provided by the Countryside Rangers. All photographs are my own except where mentioned.

Historical and Current Management

A management plan from 1989 in OCC records provides most of the information that follows. The Valley has been used only for informal public recreation over the last 100 years or so. Little management occurred from 1934 to 1985 and since 1985 it has been managed for informal recreation, including making a raised walkway of railway sleepers through the fen, improvements to footpaths, some tree work for health and safety and some sheep grazing of limestone grassland, although there was not much grazing, as is obvious from the long appearance of the sward in the 1998 photographs (see pp 4 and 5). Periodic selective spraying with weedkiller of shrubs invading on the limestone slopes and a partial cut-back of the reeds in the fen are recorded. Occasional summer cutting and raking of the sward on the south-east-facing limestone slopes was achieved (no doubt with some difficulty, due to steepness) by OCC (pers. comm. C. Whitehead, Countryside Ranger).

Longer ago, before management by OCC, the site was rough grazed, as can be seen from the short turf in this historic photograph from the OCC files of a view very similar to the photograph on the title page. The date of the photograph below is unknown but it is likely to be of 'beating the bounds' so possibly early 1900s.



Historical photograph held in OCC records for the Chilswell Valley, undated. View is from the west end of the south-east-facing limestone grassland, looking down the valley to the east and across to the oak woodland copse on the north-west-facing slope.

Grazing of the limestone grassland by cows was introduced after 1998. Up until that point the lack of annual grazing had resulted in increasing rankness and scrub (mostly hawthorn) invasion.

Oxford City Council instigated a survey by the Rare Plants Group (RPG) of the Ashmolean Natural History Society of Oxfordshire (ANHSO) in 1998 and 1999 to assess the population of a scarce plant in the county which seems to particularly favour calcareous soils, particularly limestone – namely the **wild liquorice *Astragalus glycyphyllos***.

This is a plant which is very local in Oxfordshire, with its main population centre in the Cotswold limestone areas, but it is on the Rare Plants Register for Berkshire (within old county boundary i.e. VC 22, now part of modern Oxfordshire), which covers the area of Chilswell Valley. Indeed the Chilswell wild liquorice population seems to be one of the most important ones remaining in the whole of VC 22.



Wild liquorice in flower and with characteristic claw-like seed-pods, Chilswell, July 2008

Whilst this plant seems to cope with longer vegetation (not liking grazing or cutting), the smaller limestone grassland flowers were not doing so well in 1999. The sward appears dominated by tall false oat in 1998, a plant that thrives in the absence of cutting and grazing and can eliminate species by competition. Restoration of grazing by cows (black Dexter cattle) was introduced in 1999 in an attempt to stop the loss of plant biodiversity in the limestone grassland. Current management involves grazing by approximately 6 cows on the top end of the valley in the fenced areas of both south-east-facing and north-west-facing limestone grassland and the peaty wet areas next to the stream from early November until the sward on the grassland reaches the required short height and there are enough bare soil areas to ensure seedling establishment. Over the years since the 1999 survey, wild liquorice has naturally spread to the area originally set-aside on the high eastern end of the arable field to the north of the reserve.



South-east-facing limestone grassland before grazing was re-introduced, July 1998.

OCC Countryside Ranger Anthony Roberts marking top of ANHSO RPG botanical monitoring transect running downslope.

Note rank tall grassland sward on important slope to right.

Photograph by member of Rare Plants Group



July 1998, Rare Plants Group members carrying out botanical survey transect of south-east-facing limestone grassland, mainly for wild liquorice. Note the rank tall grassland sward. Photographs by member of Rare Plants Group.

No grazing extends to the reed-dominated fen areas or to the scrub or woodlands.

Habitats and species at Chilswell today

The whole valley is used by a good variety of common birds and also mammals, such as fox, badger, woodmouse, field and bank vole, mole, grey squirrel, common shrew, roe and muntjac deer. Whilst common frog and toad have been recorded, no monitoring for reptiles by the use of refuges has yet happened. Other smaller animals may be restricted to particular habitats and these are discussed under the headings below

Limestone grassland

This comprises, on the north side of the valley, a steep south-east-facing slope, providing hot sunny conditions. It is an area where the dominant grass is upright brome and seems likely to be a reasonable fit to NVC **CG3 upright brome *Bromopsis erecta*** grassland (Rodwell, 1992).

There are some areas towards the bottom of the slope with substantial amounts of false brome *Brachypodium sylvaticum*. However, the site benefits from very little quantities of tor-grass *Brachypodium pinnatum*, a grass of calcareous soils, which can dominate and exclude other flora if grazing is reduced. Other grasses include false oat and yellow oat with small amounts of quaking grass on the north-west-facing slopes. The following are all frequent in the sward: wild basil, knapweed, greater knapweed, rough hawkbit, glaucous sedge, hawkweed ox-tongue, field scabious, salad burnet and hoary plantain. Lesser amounts are found of woolly thistle, common knapweed, red clover, hoary and common ragwort, wild carrot, hedge bedstraw, bird's foot trefoil, agrimony, black medick, mouse-ear hawkweed, bulbous buttercup, cowslip, lady's bedstraw and common rest-harrow.

The scarcest plants are rockrose, sainfoin, basil thyme, burnet saxifrage, oxeye daisy, fairy flax, centaury, large thyme, yellow wort, meadow vetchling, tufted and common vetch and orchids. bee, common-spotted and pyramidal orchids are recorded, but whilst the last two are occasional, bee orchids have not been seen in the past few years. The wild liquorice is doing well, but is more confined to longer sward on the margins of scrub since the re-introduction of grazing, which does not favour it. Trampling of stock has created areas of disturbed soil and here there are patches of sow thistles, melilot and prickly ox-tongue, which are valuable nectar sources. Species on older lists from 1998 and 1999 surveys that have not been re-found in recent years include stemless thistle, wild marjoram, small scabious, dropwort and wild strawberry. Zigzag clover used to be on the north-west-facing slopes only. Bramble and dewberry invasion from the bottom of the steep slope threatens to reduce the area of flowery grassland.

The small quarry area at the east end is important for mosses and lichens of bare limestone and the tiny mollusc typical of such hot, dry, sparse turf - moss chrysalis snail *Pupilla muscorum* (not found elsewhere). This small quarry is threatened by dogwood and dewberry invasion

Invertebrate recording is still in early stages but a few results may be mentioned. The most noticeable and numerous insects are the common grassland butterflies – the season starts with early brimstone and orange tip in April, followed by various whites, meadow brown, ringlet, gatekeeper, large and small skippers, common blues and impressive numbers of marbled whites in high summer. Scarce butterflies previously recorded but not seen on recent surveys include wall brown *Lasiommata megera* and small heath *Coenonympha pamphilus*. On the other hand, the recent recording of the rare black hairstreak *Satyrium pruni* by members of Butterfly Conservation (who regularly record on transects at the site) is encouraging. This species will be breeding on blackthorn in the valley.



Oxeye daisy and micromoths, south-east-facing limestone grassland 24.05.2014

The day-flying spectacular black and red spotted 6-spot burnet moths *Zygaena filipendulae* are also frequent. The grassland has an abundance of small brown pyralid moths in summer. The narrow valley provides sheltered, warm, conditions particularly favourable for many other invertebrates including good numbers of the common grasshopper species.

Ants particularly favour the south-east-facing hot grassland slopes and there are mounds of the yellow meadow ant *Lasius flavus*, with its associated small white ant woodlouse. A recent finding is a nest of the uncommon rather big ant with reddish thorax and legs (*Formica cunicularia*), which is a species requiring really hot, calcareous, short vegetation.

Common bumble bees and solitary bees have been recorded (not all yet identified) and important nesting zones for ground-nesting bees are the bare soil patches on the sunny warm slope and in trampled/eroded patches along the path at the top of the grassland slope. The bi-coloured mason bee *Osmia bicolor* uses empty snail shells on the slope as nest habitat. Flowers in the Fabaceae (clovers, rest harrow, vetches, melilots, wild liquorice) on the slope will be particularly important as food sources to the bee species recorded.

There are several pretty picture-wing flies breeding in flower-heads on this slope, of which the most attractive is *Merzomyia westermanni* (Notable), which breeds in ragwort flower-heads, but there are others breeding in the thistles (such as the spectacular large woolly thistle) and the common and greater knapweeds.

Especially important here is the good population of the nationally declining heath snail (*Helicella itala*), which requires hot chalk or limestone slopes with short tussocky vegetation and bare areas (although not the very short vegetation produced by rabbit grazing). This species will be eliminated, if the sward becomes dominated by tall, dense, grass with no low turf or bare areas, therefore light grazing is essential.



The very local Heath snail Helicella itala, confined to the hot dry south-east-facing limestone grassland slope - photographed 16.07.2011.

On the south side of the valley, the very steep north-west-facing slope is damper and cooler, with less plant species diversity. Here, common spotted orchids, quaking grass and cowslips are more common than on the south-east-facing slopes. The north-west-facing wetter, lower, slopes on the spring line are dominated by meadowsweet, wild angelica and hogweed. In the very bottom of the valley old fen peat is now dominated by cleavers and common nettle indicating a degree of nutrient enrichment, most likely from fertilizer from the adjacent arable areas before conversion to pasture.

Mammals using the grassland include moles (hills abundant in some areas) and a variety of small mammals including common shrew, bank vole and field vole. Kestrels have been seen hunting over the grassland.

Alkaline Fen

This has a depth of peat and limey deposit produced over thousands of years by calcium-rich, tufa-depositing, springs emerging on the gentle northern side slope. This spring flow ensures the water table remains more or less at the surface year-round, which allows peat accumulation by the continual waterlogging, retarding decomposition of plant remains. Water continually flows gently through and over the peat surface towards the central stream.

Currently the alkaline fen habitat on sloping ground down towards the stream from the northern-side footpath is dominated by common reed NVC communities such as S25, with S26 in areas where lots of common nettle are present (Rodwell, 1995). Historic botanical records (see **Appendix 1**) indicate past presence of a more biodiverse short fen/mire community. Rough-grazing would have kept the reed in check in the past and reduced its vigour to the extent that a number of smaller wetland plant species would have thrived.

The likely cessation of grazing in the early 1900s probably allowed the reed quickly to become dominant to the exclusion of most other plant species due to its tall, dense, vigorous growth. This species would have been especially encouraged by fertilizer drift or seepage from surrounding agricultural land when chemical fertilizers became widely used after the last war. The past records of the short fen plant **dioecious sedge** (recorded in 1690) and the abundant tufa (calcium carbonate, lime, travertine) deposition visible at the surface of the peat under the reed are the two biggest clues to the past presence of a rare calcareous alkaline short fen community, such as still survives in the SSSI sections of the Lye Valley fens on the other side of Oxford.

Such short fen is dependent on grazing or cutting for survival. Although the wetland at Chilswell might look like a reed bed now, historically it was not a reed bed, merely a short vegetation wetland; it has become dominated by reed due to lack of management.

Where the stream has cut down into its bed all along the valley, sections of exposed peat in the bank wall indicate that in the past a fen peat-forming environment was far more widespread up and down the valley. Most of these other areas have now undergone succession to wet woodland or scrub and seem too dry for active peat formation. Marginal to the dense reed, there are relic areas with lesser and greater pond sedge and such tall herb species as great willowherb, meadowsweet, water figwort, hemp agrimony, square-stalked St John's wort, wild angelica, common valerian and comfrey. Great horsetail competes with reed near the stream. Apart from reed-specific birds like reed bunting, sedge warbler and reed warbler, scarlet tiger moths are recorded, which will have been breeding on the comfrey. There are reed-specific gall flies in the genus *Lipara* present and probably a number of reed-specific moths, but as yet the moth fauna is mainly unstudied.

There has been no management in the fen other than cutting back reed for 1 metre distance either side of the boardwalk to prevent public access being impeded by tall reed collapsing over the walkway in summer.



Scarlet tiger moth, a spectacular fen insect, which will benefit from the remedial work planned.

Stream and banks

The highly calcareous nature of the water in the stream sometimes results in tufa deposition on stones and vegetation, resulting in accumulations of 'petrified' mosses, liverworts and twigs, and there are some tufa 'shelves' in the bed. Limestone boulders in the stream are covered by cushions of long-beaked water feather-moss and the stream banks are often carpeted by flat green growths of liverworts such as the endive peltia and strap-shaped, lemon-scented liverwort. Some ferns seem to favour the stream banks, especially the common hart's tongue fern and the local soft shield fern. Mosses abound in the seepages emerging from the bank sides and the shady humid conditions where the stream runs through woodland and scrub.

All up and down the valley, a feature of peaty areas near the stream that are not too shaded is the presence of patches of giant horsetail, which excludes most other smaller plants. Wood falling into the stream or lying in the wet seepage areas from the banks will be used by a variety of saproxylic insects needing this specific habitat.

Already the attractive scarlet elf cup fungus and the rare brown-purple cup fungus known as the midnight disco, are found on this waterlogged wood near the stream and a greater fungal diversity will certainly be identified here with more surveying and recording effort.



Scarlet elf cup fungus on waterlogged wood in the calcareous stream

Scrub on wet and dry soil

Tree invasion of wet, peaty, previous fen areas has produced grey willow and ash scrub, mainly from the middle to the east end of the valley, mostly on the southern bank and between mature hazel coppice stools. Occasional patches of relic fen communities of lesser/greater pond sedge with giant horsetail are found under the willow scrub where conditions are not too shady. Limy tufa-forming seepages and red iron oxide seepages are common. Some wetland iron oxide peaty areas are evidently more acid in soil reaction, as these are the places that bracken prefers. Drier soils higher up valley slopes have thickets of blackthorn and hawthorn with occasional hazel and field maple. These areas are very good for the birds on site, blackcap and whitethroat have been recorded nesting in the blackthorn scrub. Nettle areas ensure peacock, small tortoiseshell and red admiral butterflies are well supplied with caterpillar food plants, although the occurrence of much cleavers indicates a rather high level of undesirable nutrient enrichment in patches. Mammals using the scrub include rabbits, deer (roe and muntjac) and presumably the black hairstreak butterflies recently found (Butterfly Conservation records for 2014).

Old hedge line at top of north side above limestone grassland

Adjacent to the Hinksey Heights golf course the fence line has very old, large, rotting coppice stools of ash, field maple and several types of apple which are either hybrid crab or possibly of domestic origin, perhaps small-fruited varieties such as cider apples. Hawthorn and blackthorn scrub line the inside of the hedge and are adjacent to the footpath and grassland slope.

Amongst commoner hedgerow species such as cow parsley and wood avens, 2014 saw a really good flowering of the local goldilocks buttercup *Ranunculus auricomus* (an indicator of good 'old' habitats, such as woodland rides and glades or old hedge lines). This species has a long-lived seed bank and the impressive flowering occurred in an area where the stock had stood and trampled in the shade of trees the year before. The disturbance brought the seed up, and stock removal allowed successful germination and flowering. British bluebells and greater stitchwort are there as well, all these being indicators of the age of the hedge line and possibly that it was originally derived from woodland.



*A good flowering of goldilocks buttercup
under a very old coppice stool in the hedge line 18.04.2014*

Notable invertebrate finds from the last year in this old hedge line include the uncommon tree-nesting jet ants *Lasius fuliginosus* and the rare red-necked false blister beetle *Ischnomera sanguinicollis*, which breeds in the old deadwood .

Valley-side copse woodland



Pedunculate oak with hazel coppice on the dry southern slope of Chilswell Copse 23.10.2011.

'Chilswell Copse' was probably originally hazel coppice with pedunculate oak standards and a few old mature ash coppice stools, but it has now, in addition, a number of young ash trees and occasional crab apple trees.

Oak is not regenerating at all, whilst there are forests of young ash saplings in some areas, so this is possibly NVC community W8 in slow transition to W10 (Rodwell, 1991a) if there is no intervention to replace the oaks. Quite a number of mature oaks have died and fallen, relatively few mature oak trees are left standing. The presence of honey fungus *Armillaria* sp. rhizomorphs under bark on these fallen trunks indicates they were killed by this pathogen. Oak wood decays extremely slowly and the persistence of fallen tree trunks on site presents valuable habitat for invertebrates, mosses and ferns in moist shade.

Mature hazel coppice stools between the oak and ash trees create rather deep shade and are perhaps responsible for the absence of some of the ancient woodland ground flora recorded in the past that can no longer be found. Attractive ancient woodland ground flora indicators still obvious include: bluebell *Hyacinthoides non-scripta*, greater stitchwort *Stellaria holostea*, red campion *Silene dioica*, dog's mercury *Mercurialis perennis*, wood sanicle *Sanicula europaea* and wood anemone *Anemone nemorosa*. There are records from 2006 of climbing corydalis *Ceratocarpus claviculata*, which is now rare in the county but this has not been seen recently at this site.

Most ground flora is on the deeper, wet peaty soils towards the valley bottom. The higher steep slopes become very dry in summer, disadvantaging many species. Opposite-leaved golden saxifrage *Chrysosplenium oppositifolium*, now a rare species in the county, used to be found in the peaty bottom area of the woodland but has not been seen for many years. Clonal patches of dewberry and redcurrant are slowly spreading in the wet areas. Lesser celandine *Ficaria verna* is particularly abundant all along the peaty bottom of the valley adjacent to the stream and is attractive in flower in spring time. Goldilocks buttercup *Ranunculus auricomus* is also to be found in small quantity in the wet peaty valley bottom.

Much deadwood in damp conditions favours fungi and will mean a good saproxylic invertebrate community is present. Stumps and fallen trees are extensively colonised by mosses and liverworts, especially in the humid conditions near the stream. The moss and liverwort species list thus includes a good variety of species. Typical woodland floor mosses are present and these often form carpets over peaty areas, stumps and fallen tree trunks, providing excellent invertebrate habitat.

There are still sufficient mature trees with rot holes to provide some habitat for hole-nesting birds such as the greater spotted woodpecker, which bred on site in 2014.

Typical woodland snails of limestone soils present include the round-mouthed winkle *Pomatius elegans*, but in this north-west-facing copse there has recently been discovered a very small population of the rare ancient woodland restricted snail known as **Rolph's Door Snail** *Macrogastera rolphii*, which lives in damp leaf litter in the moister sections of the woodland slope. It is possible that it requires long-lasting oak leaf litter, and ash litter may not be suitable, as it decays very quickly, unlike oak leaves.

Towards the top of the limestone slope in the woodland there is a badger sett.

Hazels provide nuts for grey squirrels and a variety of small rodents, as is shown by the caches of nibbled nutshells found under logs – these show gnaw marks typical of woodmouse.

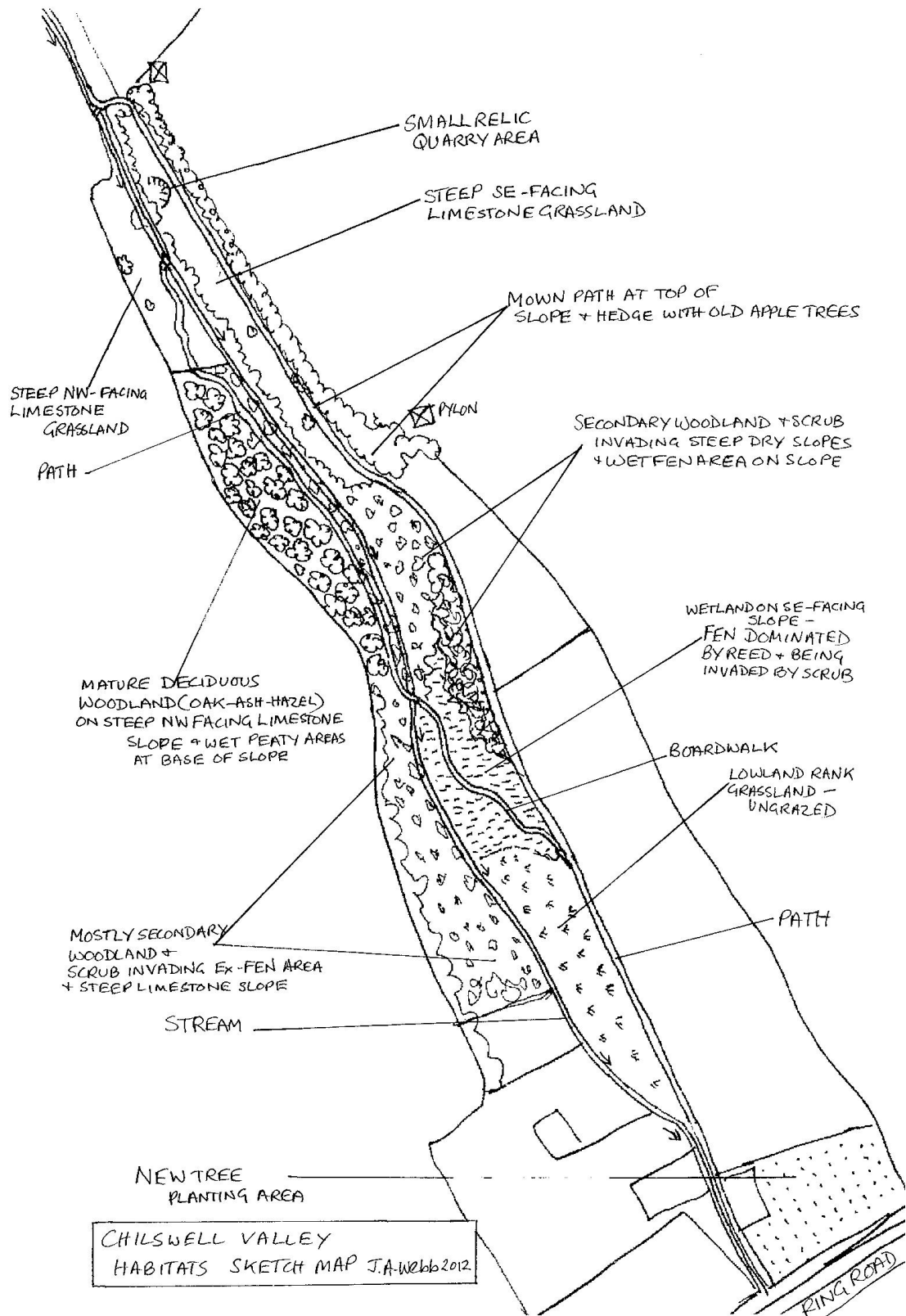


*Rolph's Door Snail Macrogastrea rolphii and wood anemones
from Chilswell copse Oak-hazel-ash woodland, 08.09.2010 and 03.04.2015*

A full table of records of the species found at Chilswell Valley to date from 2008-2015 is presented in Appendix 3 (*separate document*)

Comment on those species of conservation importance so far discovered is presented in Appendix 2.

FIGURE 1: Sketch map indicating the juxtaposition of the various habitat types in the valley before the start of the Wild Oxford Project work.



BBOWT Wild Oxford Project

At Chilswell the potential for the following possible habitat enhancements by the project work were identified as follows:

A. Alkaline fen restoration:

Chilswell valley contains a relic, rare, valuable, calcareous, alkaline fen that has been overtaken by common reed due to lack of sufficient management since the cessation of grazing. Natural succession has also resulted in the invasion of patches of scrub comprising willows and guelder rose. Whilst some of this monoculture reed habitat could be left for specific birds and invertebrates, other areas could have scrub removed and regular reed cutting and raking to return it to the vegetation type typical of when it had rough, extensive, grazing. This would increase plant diversity and benefit fen insects that like open, warm, short vegetation. It is possible that eventually some extension of grazing from the grassland area, currently lightly grazed by cattle, to the fen land would be beneficial to these newly restored short-vegetation areas. In the absence of grazing the fen will need an annual cut and rake.

Adjacent to the boardwalk OCC Rangers had previously cut and removed vegetation for 1m either side to facilitate access for walkers in the summer. Here could be seen the range of plant species indicating the diversity that could potentially be restored over the whole of the fen with further cutting and reed removal. Species that are proven to have increased with such cutting and removal of reed include attractive wetland species useful to a variety of insects, including: water mint *Mentha aquatica*, meadowsweet *Filipendula ulmaria*, marsh thistle *Cirsium palustre*, common valerian *Valeriana officinalis*, water figwort *Scrophularia auriculata*, comfrey *Symphytum officinale*, great willow-herb *Epilobium hirsutum*, hemp agrimony *Eupatorium cannabinum*, marsh woundwort *Stachys palustris*, wild angelica *Angelica sylvestris*, brooklime *Veronica beccabunga*, water forget-me-not *Myosotis scorpioides* and bugle *Ajuga reptans*. An increase in the population of comfrey by such cutting work will benefit the population of scarlet tiger moths on site. Recurrence of scarce seed bank species typical of calcareous fen that were previously recorded (like blunt-flowered rush *Juncus subnodulosus*) would be a particularly good outcome of this work.

B. Limestone grassland area extension

The south-east-facing limestone grassland, because of its aspect, is very important for attractive wildflowers providing nectar and pollen, plus the high temperatures favour the life cycles of many invertebrates including butterflies, bees, moths, flies, grasshoppers and scarce snails like the heath snail.

Coppicing of trees such as hazels and reduction of dogwood and bramble or dewberry that are shading or encroaching on the bottom of the hill would be helpful to extend the valuable area of limestone flora that is exposed to the light and warmth of sun. The small overgrown quarry at the eastern end of the grassland would particularly benefit from scrub and other vegetation clearance to expose bare limestone rocks. Nationally rare plants such as basil thyme and locally very uncommon ones such as large thyme and rockrose are confined just to the edges of this quarry, but with no management will soon be lost under scrub. This is also a much loved hot spot for basking butterflies such as the common blues and marbled whites. The limestone rocks currently exposed have interesting lichens and mosses, which are also on the way to being lost due to shading. Clearing vegetation out of the quarry and returning the site to bare rock would benefit all these different wildlife groups and thus enhance the site biodiversity.

C. Restoration of the ancient woodland on the NE-facing limestone banks:

The hazel coppice stools present in this area are becoming mature and creating dense shade, resulting in the reduction in some of the ancient woodland indicator ground flora species, such as greater stitchwort and climbing corydalis. Some re-coppicing and glade creation would enable recovery of ground flora to its original abundance and diversity. It would certainly ensure better flowering of the bluebells, anemones and wood sanicle already present.

Many of the mature oak trees on this steep north-west-facing bank have died and fallen. No natural oak regeneration is happening and the only seed germination is of ash, so without intervention the woodland will change eventually to an ash wood with hazel. Dominance of ash could be reduced by planting with young oak trees and/or small-leaved lime trees in new glades. This would preserve the nature of the woodland and maybe continue the production of deep persistent leaf litter layers favoured by the rare Rolph's door snail. Small-leaved lime (*Tilia cordata*) is suggested as replacements for some fallen trees, as this species has very beneficial flowers for insects. The flowers produce abundant nectar in June to July, which would provide food for insects from all habitats in the valley, especially fen species. Lime was the historic native tree of the ancient woodlands of the area on limestone, as confirmed by pollen analysis results from peat deposits at Wytham Marley Fen, only a short distance to the north of Chilswell Valley.

Results of the first year of the BBOWT Wild Oxford Project work, spring 2014 to spring 2015

Volunteers under the leadership of Andy Gunn contributed to remedial work on the fen, the limestone grassland and the copse woodland.

A total of 8 days' work at Chilswell Valley was undertaken between March 2014 and March 2015, with an average of 12 volunteers at each session. As each session lasted for 5 hours, about 480 volunteer hours were put in at Chilswell Valley (pers. comm. Andy Gunn). Particularly good numbers of young volunteers came from the students of St Clare's College in Oxford, who attended with their tutor. Monitoring of progress happened either during the sessions, or by separate visits after work sessions.

Alkaline Fen work

Before the start of the Wild Oxford Project work, the chosen fen area downslope of the boardwalk was almost a monoculture of dense, tall, impenetrable reed *Phragmites australis*, which tended to overhang and collapse over the boardwalk. Very few other herbaceous plants could be seen, but occasional greater bindweed *Calystegia* sp. and hop *Humulus lupulus* plants scrambled over the reed. Scrub present included young grey and crack willow clumps with guelder rose and some hazel coppice stools.

An old boardwalk of railway sleepers was constantly becoming water logged, making it slippery and access by walkers difficult. Volunteer time was used in the past to improve drainage as described below. This work was carried out by Oxford Conservation Volunteers and OCC staff in 2012, but did not really solve the problem.



September 2012. Problems of waterlogging of boardwalk in fen needing remedial drainage work



Fen area before work, dense common reed with occasional greater bindweed, summer 2011



Fen before work, dense monoculture reed dominates the habitat and the old sleeper boardwalk, summer 2011

The first Wild Oxford work session in the fen area was in August 2014 and the area chosen for cutting short was a triangular fen portion, mostly downslope from the boardwalk to the central stream. Whilst slashers were useful, work progressed more quickly with the Austrian scythe in the hands of expert BBOWT volunteer Jim Ballantyne. This was the first time this reed had ever been cut since cessation of grazing in the valley prior to 1937 and the old, tough, dead stems quickly blunted any blade, necessitating constant sharpening of tools.

Three volunteer work sessions focusing mainly on the fen area between August 2014 and January 2015 achieved a clearance of approximately 0.44 ha, with the reed risings raked to piles downslope near the stream or used for an educational thatching project with children at Hill End, near Farmoor. As the total reedy fen area was estimated to be 0.79 ha, this means that just over half (56%) is now cleared and will be kept short to be renovated to short fen. This remediated area runs from SP5023 0369 at the western end to SP5030 0371 at the east end (see sketch map, **Figure 2**, p. 19).

The remainder of the reed-dominated area will be left untouched to provide habitat for birds and reed-specific insects. The area now short will have light and warmth reaching the bare peat and the amount of trampling disturbance occasioned by the volunteers cutting and raking will have brought buried seed to the surface, stimulating germination. Returning species will be identified as soon as they are big enough to flower, which may take more than one year

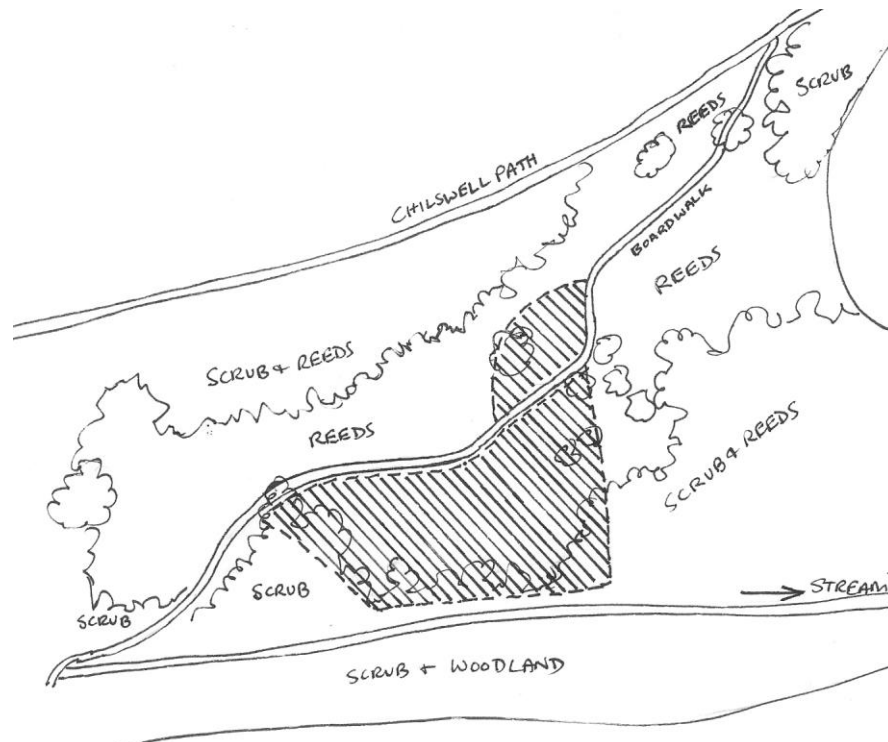


Figure 2: Sketch map of reed-dominated fen showing the proportion cut and raked in 2014 (cross-hatched area)

It will be important throughout the next spring and summer to keep cutting young reed shoots back as they emerge from under the peat, to reduce the vigour of the plants and enable any germinated seeds of other plants to have a chance of surviving to flowering without too much reed competition.



Volunteer using a slasher to cut dense reed in first fen work party on 30.08.2014



Volunteer Jim Ballantyne using Austrian scythe very effectively in the fen 30.08.2014



Expert scyther Jim Ballantyne trains mother-and-son volunteers in the work on 11.10.2014



Area of reed cut after first session, 30.08.2014.



First area of reed cutting and scrub removal shows some degree of reed re-growth, which was later scythed off. Note old sleeper boardwalk still in place, 05.11.2014.



St Clare's student removing scrub from fen next to old sleeper boardwalk 11.10.2014

In November 2014 work started on the path through the fen. The old railway sleeper boardwalk was replaced by a recycled plastic boardwalk. This was placed over the original sleepers and raised the walkway out of the water table, so that the whole area could be accessed with dry feet at any time of the year.



Recycled plastic boardwalk construction in progress at start of path through fen, 05.11.2014.



Fen area looking to the east/north east, with new boardwalk and view of total fen area cut and cleared by 10.01.2015.

Limestone grassland area work

Work here started at the foot of the south-east-facing slope on the north side of the stream with the re-coppicing of large hazel stools, which were casting dense shade on the adjacent grassland, and the slashing of brambles, which were extending up the grassland slope. Also targeted were dogwood and bramble, which were choking part of the small quarry and threatening to overwhelm valuable yellow meadow anthills at the top of the slope. Work extended for about 100m from SP49792 03464 at the west end to SP49876 03496 at the east end.



St Clare's students coppice hazel and slash bramble encroaching on the limestone grassland slope 11.10.2014



Removing dogwood and bramble at top of small quarry area. Scrub had been encroaching on a yellow meadow ant hill area with rare plants on the south-east-facing limestone grassland. St Clare's students, 11.10.2014.



Partially cleared small quarry area on south-east-facing limestone grassland. Photo taken on the BBOWT Good Friday picnic day, 03.04.2015

Chilswell Copse woodland and scrub areas work

There is as yet not much to report from woodland work, as most of the 2014 sessions concentrated on the fen and limestone grassland. However a couple of work sessions focused on a number of mature hazel stools, which have been re-coppiced to let in more light and create some glades.

Young small-leaved lime whips (native source) were planted out in protectors during winter 2014/2015 in some of the lighter glade areas produced by coppicing work on the southern wooded bank (at approximately SP5015 0365) and also another group at the top of the scrub dominated slope on the northern side of the reserve, adjacent to the public footpath (at approximately SP5011 0370).



St Clare's students coppicing hazel in the oak woodland on southern slope 10.01.2015



Young small-leaved limes planted in glade from hazel coppicing, south bank, oak woodland, southern slope, 03.04.2015



Young small-leaved limes planted on northern limestone slope, scrub area just down from the public footpath up the valley, 03.04.2015.

Summary and Conclusions

The BBOWT Wild Oxford Project has made a big difference to the habitats in Chilswell Valley in just the first full year, with an average of 480 volunteer hours worked and all target areas showing positive change. The response of the vegetation will not begin to be apparent until the end of 2015, however, and further measures of any success will have to wait for surveys then.

Achievements are:

- Just over half (0.44ha) of the reed-dominated fen has been cut and the risings raked off. This area will be cut short annually to encourage restoration of a more biodiverse tall herb community from the seed bank. The remainder of the reed-dominated area has been left uncut as a contrasting habitat.
- Mature hazel coppice and scrub of dogwood and bramble has been cut back for 100m of the bottom slopes of the north side of the valley to increase the area of south-east-facing limestone grassland exposed to full sun and to prevent loss of grassland habitat to succession.
- The copse woodland on the south side of the middle of the valley has had some re-coppicing of mature hazel stools to let more light in to encourage ground flora. Small-leaved lime whips have been planted in some of the glade areas so created and on the scrub bank down from Chilswell path on the north side of the valley. These young trees will go some way to compensating for loss of mature trees in the copse to fungal disease.

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APPENDIX I:

Historical information on plant species records for the Chilswell Valley

Chilswell Valley, whilst in modern Oxfordshire, falls in the old county of Berkshire, botanical Vice County 22, so old records might be in two different Floras.

It is commonly also called '**Childswell Hills**' and '**Childsworth**' and various other names, as indicated in the extracts below which are all retrieved from the Floras written by George Claridge Druce i.e. Flora of Berkshire (1897) or Flora of Oxfordshire (1886, 1927). Some of these are now available as e-books.

The valleys leading from Boar's Hill/Hinksey Hill high ground down to the Thames floodplain area are variously referred to in early botanical texts quoted in Druce floras as '**The Hinksey Ravines**' or '**Bogs west of Oxford**' and several of them were known as '**Rifle Range Valley**' or '**Rifle Butts Range**'.

(There are many records of plants growing 'above South Hinksey', which is presumed to be Chilswell valley but could just possibly refer to Limekiln Copse, the next ravine to the south, rather than Chilswell Valley itself.

Records by William Browne, approximately 1660 (a-j below)

Druce, in the introduction to his *Flora of Oxfordshire* (1927) mentions manuscript notes at Magdalen College made by the botanist **William Browne (1629-1678)** in manuscripts of William How (1619-1656) or manuscript notes deduced by Druce to be by Browne in a copy in the Bodleian of Lyte's edition of Dodoens *Herbal* of 1619, in which there are notes giving the habitats of plants from the neighbourhood of Oxford—presumed by Druce to have therefore been seen around 1660.

Inverted commas indicate what the notes actually said in the handwritten notes attributed to Browne.

- a. '**Golden rod**' (presumed *Solidago virgaurea* by Druce) '**in Chilsey Woods**'.
- b. '**Foxglove**' 'Plentifully in **Chylsey Woods**'
- c. '**May lily**' (presumed to be lily of the valley by Druce) '**Chilsey woods**'
- d. '**Wild sage**' (presumed *Teucrium scorodonia* by Druce) '**Chilsey Woods**'
- e. '**Wilde spleenwort**' (presumed *Blechnum spicant* by Druce) 'It growes in **Chilsey Woods**, by ye side of a hill wheare springs fall'
- f. '*Ros solis*' (**Sundew**, presumed to be *Drosera rotundifolia* by Druce) 'In a bog on **Chilsey Woods**'. This may have been in a more acid area, now lost, further up the valley by the current Chilswell farmhouse.
- g. '**Madder**' (? Presumed by Druce to be *Galium hercynicum*, now *G. saxatile*, Heath bedstraw) 'Wilde Madder growes in copse by **Chyllsey Woods**'.
- h. 'Earth Chestnut' (presumed **pignut**, *Conopodium majus* by Druce) 'In Merley Wood and **Chylsey Wood**...'
- i. **Burnt Tip orchid** (*Orchis ustulata*) 'Orchis sive Cynosorchis Austriaca flore albo'...'Colle **Chilswelliensi**'
- j. **Honeysuckle** (*Lonicera periclymenum*): 'Periclymenum alterum Quercinis foliis... in Colle **Chilswelliensi**'

Yellow Star of Bethlehem (*Gagea lutea*) near **Childswell Farm**, 1883 seen by Druce and '**above South Hinksey**', 1953, by Humphrey Bowen, Flora of Berkshire, 1968.). This plant used to occur also at Cumnor Hurst and Marley Wood to the north of Chilswell.

Marsh Violet (*Viola palustris*) the first county record of this species is from Chilswell, reported by Druce to be from **Robert Plot in 1677**: 'Viola palustris rotundifolia. It grows... most plentifully at **Chilswell** in Berkshire amongst the moistest Bogs' - 1677, by Robert Plot in his 'Natural History of Oxfordshire'.

There is a specimen of Marsh Violet from Chilswell collected by Dillenius in 1744 that is the Oxford University Plant Sciences Herbarium. This plant also seems to have been seen at Chilswell later by botanist Humphrey Bowen, as mentioned in his 1968 Flora of Berkshire. **Marsh violet is now extinct in modern Oxfordshire.**

Flea sedge (*Carex pulicaris*) '**Rifle Butts Range, South Hinksey**', Druce.

Dioecious sedge (*Carex dioica*) 'Gramen cyperoides minimum Ranunculi capitulo rotundo, frequently found on the **Bogs on the West side of Oxford**' – a record by Bobart in Ray, Synopsis, 1690. P532. Druce.

This tiny sedge is only 10-15cm high and does not survive any degree of rankness in the wetland vegetation. Therefore, all these 'bogs' (which would have included the wetland at Chilswell) must have been quite **well grazed** at this time.

Dioecious sedge was thought recently to have become extinct in the Oxfordshire but has recently (2012) been re-found surviving in minute amounts in the Lye Valley SSSI fens and the Frilford Heath SSSI calcareous fen, which are both cut and raked.

Fragrant orchid, current name *Gymnadaenia conopsea* but referred to as '*Habenaria gymnadenia*' at '**Chilswell Hill**' in Druce 1927.

LESS CERTAIN RECORDS

Military orchid? *Orchis militaris* 'Hinksey' by Bobart

Pasque flower? *Pulsatilla vulgaris*, *Anemone pulsatilla*, *Anemone pratensis*.

'Anemone. It growth about Oxford as my friend Falconer tolde me', Turner, Herball, 1551. Chilswell contains limestone grassland, which is a suitable habitat for this species.

APPENDIX II

Examples of notable/important wildlife already recorded for the site from previous surveys.

For explanation of conservation statuses, see Wild Oxford Lye Valley report.

Birds: Reed bunting, sedge and reed warbler are sometimes seen and heard in the reed-dominated fen. Greater spotted woodpecker recently seen breeding in hole in ash tree in the copse.

Lepidoptera: Black hairstreak *Satyrrium pruni*, found by a volunteer surveyor from Butterfly Conservation in 2014. Breeding colony suspected to be present on blackthorn. This shrub is present at the top of the limestone slope and in the valley bottom in a thicket. One of the rarest British butterflies, it has a very restricted distribution that follows a line of clays between Oxfordshire in the south-west and Cambridgeshire in the north-east.

Scarlet tiger moth *Callimorpha dominula* in fen, breeding on comfrey (Local).

Flies: Picture-wing (Tephritid) flies *Myopites inulaedyssentericae* breeding in fleabane, Notable; *Merzomyia westermanni*, breeding in ragwort heads in limestone grassland. Crane fly *Dicranomyia lucida*, Notable, breeding in fen. Fungus gnat *Ditomyia fasciata* breeding in bracket fungus on ash tree in copse woodland, Notable.

Beetles: Ground beetle *Ophonus ardosiacus* Notable, deadwood blister beetle *Ischnomera sanguinicollis* - Notable

Molluscs: Heath snail *Helicella itala*, in limestone grassland –declining nationally inland but still frequent in coastal sand dunes. Rolph's door snail *Macrogastera rolphii*, in copse woodland, rare ancient woodland indicator species with distribution centred on the south-east of England.

Hymenoptera: The uncommon/local Ants *Formica cunicularia* and *Myrmecina graminicola* and the solitary bicoloured mason bee *Osmia bicolor* (notable) . All in limestone grassland

Fungi: Toadstool - deadly dapperling *Lepiota brunneoincarnata* under scrub, uncommon but not rare; plus the purple-brown cup fungus on dead wood in stream, known as the midnight disco *Pachyella violaceonigra* – Red Data listed as 'Near Threatened' and has only 73 previous records in the British Mycological Society Fungus Records Database (FRDBI). This appears to be the first Oxon record.

Vascular Plants:

Large Thyme *Thymus pulegioides* – just off the Oxfordshire Rare Plants Register (RPR), slightly too many sites (more than 10).

Sainfoin *Onobrychis viciifolia* – on Oxfordshire RPR and National UK Red list.

Basil thyme *Clinopodium acinos* – on Oxfordshire RPR and Section 41 (UKBAP Priority) Species.

Hoary Plantain *Plantago media* – on Vascular Plant Red List for England (BSBI) as Near Threatened

Vascular Plants (continued):

Field Scabious *Knautia arvensis* – on Vascular Plant Red List for England (BSBI) as Near Threatened

Wood sanicle *Sanicula europaea* – on Vascular Plant Red List for England (BSBI) as Near Threatened

Common rockrose *Helianthemum nummularium* – on Vascular Plant Red List for England (BSBI) as Near Threatened

Goldilocks buttercup *Ranunculus auricomus*, declining species in the county. Local.

Wild liquorice *Astragalus glycyphyllos* – local in Oxon but this is on Rare Plants Register for Berkshire VC22 (Chilswell is in VC 22)

Pteridophytes (Ferns and allies):

Soft Shield Fern *Polystichum setiferum* – removed from the Oxfordshire Rare Plants Register (slightly too many sites) so local.