



# Howe Park Wood Management Plan

Published November 2015

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## HOWE PARK WOOD - MANAGEMENT PLAN 2015

### Site Summary

Site name:	Howe Park Wood
Location:	Howe Park Wood is situated 5km south-west of Milton Keynes city centre
Grid reference:	Within OS grid squares: SP: 829341, 837341 and 829346, 837346.
Area:	24.1 ha (59.5 acres) of woodland and an additional 8.5 ha of younger landscapes (1980's to approx. 2005) including sections of grid-road corridor (V2: Tattenhoe Street & H7: Chaffron Way)
Height:	Between 98 and 111 metres above sea level
Age:	The wood was indirectly mentioned in the Domesday Book, so is 'Semi-Natural Ancient Woodland' (continuous woodland since before 1600)
Designations:	Site of Special Scientific Interest (SSSI) – therefore not separately listed as a Buckinghamshire & Milton Keynes Local Wildlife Site (Site of Importance for Nature Conservation).

### Aim

The management aim is to maintain and enhance the Semi-Natural Ancient Woodland character, biodiversity conservation interest, recreational and landscape value of the woodland and edge environs of Howe Park Wood.

### Summary of Objectives

- Conservation of habitats and biodiversity, including preserving and enhancing the Wood's characteristic W8 habitats and species, and conditions for the resident Black Hairstreak butterfly.
- Maintaining and enhancing the Wood's landscape and visual character.
- Providing access for relaxation and enjoyment.
- Providing information about the Wood and enabling it to be used as an educational resource.

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Publication date:	November 2015
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Review Date:	November 2020

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## Section 1: Site Description and History

### 1.1 Ownership

Since 1992 Howe Park Wood has been owned and managed by The Parks Trust, the self financing charity dedicated to caring for over 2,000 hectares (5,000 acres) of parks, woods, lakes, grasslands and other landscapes in Milton Keynes. The Wood is held on a 999 year lease from the freeholder, Milton Keynes Council. Previously the land was owned by Milton Keynes Development Corporation who purchased it in 1968 as part of their city-wide land holdings to develop the New Town of Milton Keynes. *Plans 1 and 2* show the boundaries of the woodlands management plan and ownership of green space found in the vicinity of the wood. Howe Park Wood has 'Site of Special Scientific Interest' (SSSI) status, as designated by Natural England, under Section 28 of the Wildlife and Countryside Act 1981.

### 1.2 Location and structure

Howe Park Wood is situated 5km south-west of Central Milton Keynes within Tattenhoe grid-square which, south of the wood, includes housing, a local park and playing fields, the Tattenhoe Linear Park and Loughton Brook, and Snelshall industrial area further south.

Tattenhoe and Howe Park Wood have been surrounded by four of the city's main grid-roads (*Plan 9*). The grid-squares beyond these are: Westcroft to the north (housing with a district retail centre), housing at Emerson Valley to the east, Tattenhoe Park housing to the west (still under development in 2015), and much further south the Windmill Hill Golf Course at the west end of Bletchley.

Howe Park Wood covers approximately a quarter of the Tattenhoe grid-square. It is served by two dedicated car parks, one to the north-west, which also serves the education and visitor centre (completed in November 2014), and another on the east side at the end of Howe Rock Place.

There are linear shaped tree and shrub plantations flanking each of the surrounding grid-roads, as well as meadowland and ponds, with a scattering of mature trees between these roadside plantations and the Wood. The Wood is surrounded by metalled paths beyond its perimeter and there is a horse-riding trail along the west, north-west and south-east sides of the Wood.

### 1.3 Area covered by management plan

Howe Park Wood itself is 24.1 ha (59.5 acres) in size. This management plan covers Howe Park Wood itself and also parts of the grid-road landscape alongside H7 (Chaffron Way) and V2 (Tattenhoe Street) and land between these and the Wood; the boundaries are shown in *Plan 1*. These newer areas of roadside landscape (1980's onwards) are found adjacent to the woodland boundary should relate directly to the woodland and its management. These areas collectively are an additional 8.5 hectares of land, meaning the total area covered by the management plan is 32.6 hectares.

### 1.4 Topography, geology, hydrology

Howe Park lies 98-111 metres above sea level along a ridge and plateau running south-west to north-east, with the northern sections of the Wood sloping to the north-west and the southern section sloping slightly to the south-east.

There are two main watercourses found in the area, but neither is within the boundaries of the wood (see *plans 6 and 9*). Loughton Brook is some 300 metres to the south of the wood. The other brook runs along the north-western boundary and both watercourses meet at Furzton Lake. Within the wood there are several areas of restricted drainage which are partly responsible for its ecological interest.

The soils are developed from calcareous boulder clays and range from free draining clay loams to seasonally waterlogged gleyed clay loams. The topsoil is generally around pH 6.9, becoming more alkaline at depth although there are more acid areas. The soils can be affected by both summer drought and winter waterlogging.

There are two old main rides which are completely straight and cross within the wood, dividing it into four unequal size compartments. The east/west ride has been metalled and runs the length of the central ridge. Ditches at either side of these main rides remove surface water from the paths, but their wider effect is variable due to slow lateral drainage in these clay soils. There are also woodchip-surfaced footpaths in a ring through the centre of the wood and in Compartment 1 these are supplemented by an old narrow ride system.

### 1.5 Woodland history and archaeology

The Domesday Book of 1086 does not specifically name Howe Park Wood, but it does refer to an unnamed wood in the Shenley Brook End Parish. This is probably the same wood that is called 'Howepark' in a document dated 1371. Howe Park Wood can be considered a Semi-Natural Ancient Woodland (i.e. pre-1600).



The wood itself has medieval boundary features and would have been used for timber and wood resource, for pig pannage, and as a deer park. It is highly likely the Wood would have been coppiced in much the same way as Linford and Shenley Woods and would have supplied produce to the medieval village of Tattenhoe to its south-west and Snelshall Abbey. According to 17<sup>th</sup> century returns the wood was 88 acres in extent, but by 1881 the woodland was its present size of about 60 acres (24 hectares).

**Picture 1;** An old boundary marking Oak, found on the wood's south side, that has been pollarded several times in the past.

Whaddon Hall Estate owned the woodland from 1732 until 1918 but specific records have not been found for this period. In 1918 it was sold as part of Howe Park Farm and from then to 1968 very little is known about its management. Coppicing ceased within the early part of that period or earlier, and remaining saleable timber was removed, probably during the 1939-1945 war. This resulted in the wood becoming increasingly derelict. In 1968 the Wood was purchased by the Milton Keynes Development Corporation (MKDC) and remained with that organisation until 1992 when it became into ownership and the responsibility of The Parks Trust Milton Keynes (TPT). The Trust's initial wildlife policy identified the woodland as a site of high intrinsic wildlife value (a Category 1 site).

By informal agreement, from 1973 until the early 1990s, Milton Keynes Natural History Society (MKNHS) carried out substantial coppicing, scrub clearance and footpath clearance works, primarily in Compartment 1 (see plan 3). They also carried out wide-ranging wildlife surveys, particularly in the 1970s and 1980s, which over a few years included daily moth monitoring as part of a national scheme run by Rothamsted. They also prepared an initial management plan and proposals for leisure use of the Wood. Appendix 4 sets out more fully the contributions by the Natural History Society to woodland management and wildlife monitoring.

Active management was started by MKDC in 1975 when a drainage system was imposed on either side of the two main rides and within compartments 2, 3 and 4. With the exception of the laying of some of the boundary hedges little else was done until 1983 when coppicing, thinning, clearing of fallen scrub and some planting was implemented. Similar annual operations have been ongoing since

then. A management plan was formulated in 1987 together with a plan of operations which covered the period 1987-1992.

Broadly the history of the wood has probably been along the following lines:

- a) Natural development of woodland following the last ice age from c.10,000 BC with a succession from pioneer species to the tree species which have largely dominated it for at least a thousand years.
- b) Probably some woodland clearance to form wood pasture in the early medieval period.
- c) Formation of wood banks and fencing in the later medieval period to enable it to become managed woodland and parkland to hunt deer and stock other animals.
- d) Management of the woodland by coppicing with standards to provide a range of timber, wood products and firewood, probably with pannage for pigs, up until the mid-Victorian era, with much timber removed for construction of buildings and ships, but the canopy trees continuing to be replaced by ongoing age-classes.
- e) Perhaps 100 years of neglect leading to a semi-derelict woodland by the mid-20<sup>th</sup> century.
- f) Before and during the two world wars, decline of woodland management, cessation of coppicing and extensive removal and non-replacement of Oak and other timber.
- g) In 1968, purchase of the wood by MK Development Corporation.
- h) In 1994, the Wood was Notified as a Site of Special Scientific Interest.
- i) Over the 40 years to 2015 the woodland has been opened up for public access and programmes of woodland management have been implemented.

## 1.6 Compartments

From the mid 1980's woodland management was planned in four main compartments (*plan 3*) with all but one of these further divided into sub-compartments. In 2015 an evolving arrangement meant that the main compartments were broken down into smaller but relatively equal sections within the original four compartments. Area sizes of the 15 compartments are shown in Table 1 below (*also see plan 3*).

Each compartment will be worked (thinned/coppiced etc) on a 15-year cycle. This is compatible with the expected growth rates and the understorey species found in the wood and reflects the previous 15-year cycle for Howe Park Wood.

1a (2.98 ha)	2b (1.10 ha)	3c (0.74 ha)	Surrounding younger landscape found within the Management Plans boundary = 8.5ha
1b (2.09 ha)	2c (0.62 ha)	3d (2.28 ha)	
1c (1.16 ha)	2d (1.41ha)	4a ( 1.56 ha)	
1d (3.47 ha)	3a (1.51 ha)	4b (1.44 ha)	
2a (0.70 ha)	3b (1.31 ha)	4c (1.53 ha)	

Table 1. Howe Park Wood compartments and associated areas in hectares (2014 onwards)

## 1.7 Tree species

The canopy of Howe Park Wood is largely comprised of: Ash *Fraxinus excelsior*, Aspen *Populus tremula*, Field Maple *Acer campestre*, Hornbeam *Carpinus betula* and Pedunculate Oak *Quercus robur*. In the 1995 survey, Ash was by far the largest component of the canopy (in 79% of quadrats), followed by: Aspen (39%), Field Maple (36%), Hornbeam (19%); with Pedunculate Oak (19%) less abundant than in Linford and Shenley Woods. The occasional mature Crab apple, *Malus sylvestris* can also be found in various location in the wood.

Many of the mature Ash have evidently been recruited from previously coppiced stools and have basal cavities. Oak standards are thinly scattered through the wood. Hornbeam are found as standards and as over-mature coppice. Field Maple is found as multi-stemmed trees growing from previously coppiced stools but also, commonly, as large standard trees. The poorly drained plateau areas are dominated by pole stage thickets of Aspen which contain varying proportions of *Salix caprea* Goat Willow and *Salix cinerea* Grey Willow (or Sallow) in the understorey, particularly in compartment 1b.

An unusual feature of the woodland is to find such a number of Hornbeam in a woodland so far north. Long-established Hornbeam are not present in Shenley or Linford Woods and other older woodland in the area, and this is beyond the usual edges of its natural zone, though it is occasionally recorded north of this in Peterken's Type 9Ab woodlands on heavy, wet soils with a wide range of PH. George Peterken's advice in 1995 was that it is best to assume that these trees are of ancient origin unless there is unequivocal information to prove otherwise.



**Picture 2;** A Crab apple, found on the north west side of the wood . Because of its age and relative size it can be considered a veteran tree.

In some areas of the wood natural regeneration of Ash and Aspen is prolific. The oldest of these appear to date from the early 1950's and is probably due to the cessation of grazing by rabbits following their virtual eradication at that time by myxomatosis. Regeneration of Hornbeam and Field Maple is common in this Wood but Oak regeneration is rare.

The shrub layer is dominated by Hazel *Corylus avellana* in some areas and Blackthorn *Prunus spinosa* in others. Through sections of the wood Hawthorn *Crataegus monogyna*, Dogwood *Cornus sanguinea*, Sallow (Grey Willow) and Goat Willow are all common. Before management recommenced, much of the Hazel coppice was over-mature and moribund, similarly much of the Blackthorn was over mature and dying and large areas were fallen or were in the process of collapsing.

The most abundant shrub species in the underwood is Hazel, followed by Hawthorn. Also present are: Elder *Sambucus nigra*, Blackthorn and Dogwood. In moister areas and at low frequency there are: Spindle *Euonymus europeaus*, Wild Privet *Ligustrum vulgare* and Guelder-rose *Viburnum opulus*.

### 1.8 Woodland characteristics and NVC

Howe Park Wood is mostly remnant Semi-Natural Ancient Woodland. A study in 1995 applied the National Vegetation Classification (NVC) which showed that the Wood is predominantly W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland (Ash, Field Maple, Dog's Mercury Woodland) which are typically wet woodlands on clay. More specifically, large areas of the woodland were W8a (*Primula vulgaris-Glechoma hederacea* Primrose – Ground-ivy sub-community) which applied to the southern half of compartment 1, and all of compartments 3 and 4. Compartment 2 was W8b (*Anemone nemorosa* Wood Anemone sub-community) and the northern part of compartment 1 was W22b (*Prunus spinosa-Rubus fruticosus* Blackthorn-Bramble scrub: sub-community *Viola riviniana-Veronica chamaedrys* Common Dog-violet–Germander Speedwell).

Characteristics of the surrounding landscape included in the management plan

The management plan also includes 8.5 ha of relatively new landscape (see plan 3) that is found beyond the actual woodland boundary. This land includes young plantations, shrub beds, grassland (including meadow land where summer hay is produced), a series of ponds and the newly built Education and Study centre (opened in late December 2014), with its adjoining car park. These areas are found on the immediate north-western edge of the wood.

Other grid-road plantations and grassland are found on the wood's northern side. On the south-eastern side there is a public road (Hengistbury Lane) and housing (including the Parks Trust owned Passive House), a small car park that serves the wood, a small fruit orchard and a meadow area. Much of this landscape was put in place by Milton Keynes Development Corporation in the 1980's and its successors, up to the 2000's. The above sections of land have been included in the management plan because, how they are managed directly influences the woodland and especially its transitional edges, as they importantly link into other green corridors that are part of the city's large green space infrastructure. With the newer sections being included as part of the management plan it allows consistency in objectives and aims across the woodland and its immediate surrounding landscape, including transitional ecotones at the woodland edge and connections towards the wider countryside.

### 1.9 Woodland management

The Wood appears to have been managed for several centuries as a mixed coppice with standards, with varying degrees of intensity or neglect. There are some large old coppice stools of an estimated 450-500 years of age. Until 1983, when MKDC forestry team started managing the woodland more actively, coppicing was much less intensive in the 20<sup>th</sup> century up to then and many of the standards had been removed, with the exception of some areas of Ash high forest in Compartments 2 and 3. Coppice and logged-out areas had been left untended for many decades prior to this. In some areas natural regeneration of Ash and Aspen has been prolific since the early 1950s, probably as a result of timber trees (Oak?) being removed during World War 2. In other areas scrub species such as Willows, Hawthorn and Blackthorn had suppressed tree growth. No planting was done until 1983/84 when some cleared areas in compartments 2 and 4 were restocked with limited Oak, Hornbeam and Field Maple planting. Since then several coupes have been created in compartments 1, 2, 3 and 4 and planted with the same species. Natural regeneration of Ash has been encouraged and some Hazel and a few incidental Crab Apples *Malus sylvestris* were planted.

Earlier versions of management plans were commissioned by the MKDC in 1985 and by The Parks Trust in 1993. This 2015 plan has incorporated more recent thinking, with more emphasis on habitat management, but incorporates much of the thinking from those earlier plans. The 1993 management plan concluded that the woodland at that time was silviculturally understocked. This is still the case in 2015 regarding the high canopy. One of the objectives of this management plan will be to encourage the potential high canopy species to develop through the lower and middle canopies.

Since The Parks Trust inherited these woods in 1992 the aim has been to restore the woodland to a more mixed aged structure of trees by thinning of upper and middle canopy trees (standards), coppicing of lower canopies and the creation of coupes, to encourage natural regeneration. The main purpose of this approach has been to benefit the Semi-Natural Ancient Woodland flora and fauna including notable species already present such as the Black Hairstreak Butterfly *Satyrrium pruni*. Approximately 50% of felled timber is left on the woodland to become deadwood habitat. The remaining felled roundwood is cut to 2.2 metre lengths and sold as firewood.

### 1.10 Landscape character and connections

Howe Park Wood lies bestride a ridge, so is visible from a distance in most directions. It is a prominent mature landscape feature of significant visual value. It provides a landscape backdrop from the H7 and V2 grid-roads and nearby Westcroft district centre. It clearly delineates Tattenhoe housing from surrounding areas, while providing a close woodland encounter for the houses close to its southern edge. At a distance, from most directions it provides a strong wooded hilltop aspect.

The Wood's landscape and biodiversity value is enhanced by its connections to the wider landscape (see plan 9). Aside from the linear landscapes of the surrounding grid-roads, Howe Park Wood is

well-connected to its west and to the protected landscapes surrounding St Giles Church and the medieval moats, meadows and woodland on the site of the former mediaeval village of Tattenhoe. These reach westward towards the fragment of woodland at Kingsmead Spinney and beyond that to the North Buckinghamshire Way and the wider countryside. This area and Tattenhoe Park were part of Whaddon Chase and contain a number of veteran and ancient trees as well as a remnant woodland strip, thought to include some areas of ancient woodland origin, to the north of H7 Chaffron Way within the Westcroft area. The distance between Howe Park Wood and the seven miles of linear parkland flanking the Loughton Brook is only a few hundred metres. All in all Howe Park Wood is part of a significant inter-connected landscape.

### 1.11 Management for landscape and visual value

The Wood's principal and more obvious visual attributes include mature Pedunculate Oak, Hornbeam, Ash and groups of Aspen as standard trees with occasional Field Maple, together with wild flowers, which are at their most prolific during the spring when there are swathes of Bluebells *Hyacinthoides non-scripta*, Wood Anemones *Anemone nemorosa*, small patches of several Violet species *Viola spp.* and other wildflowers. The woodland floor below mature Hornbeam tends to be more void of ground cover than other areas of the wood because of the lack of light below the Hornbeam. Autumn brings gold and brown leaves and dark berries of Black Briony *Tamus communis*.

The opening up of the woodland to public access in the 1980's, by the construction of a network of hard-surface and woodchip-surface paths, enables people to enjoy varying woodland views as they walk through or ride past these woods. As soon as walkers enter the Wood, nearby urban development disappears from view. The east-west ride provides long views from one side of the Wood to another along a metalled path. The north-south ride crosses the ridge and, although it is straight, its views are therefore rather different, focusing on the centre of the woodland. The other paths are mainly surfaced with wood-chip or are turf and are circuitous, so provide much more intimate connections with constantly varying and closer views, while maintaining good forward views that helps provide a sense of safety. At various points, where paths intersect, longer views into the woodland are achieved. At some points, views and focus on trees of unusual form or substantial trees noted for their size and obvious age may also need to be considered. Over some lengths of path, good visual access should also be provided to spring wildflower areas or to a pond.

### 1.12 Biodiversity and ecology

The ecology of Howe Park Wood has been the subject of many surveys, with 22 professional ecological studies undertaken, of which 13 are specific either to Howe Park Wood or that and Shenley and Linford Woods, which therefore provide useful comparisons. A full list of these reports is provided in Appendix 1 as well as a summary of those of most significance for an understanding of the Wood's ecology, with consultants' recommendations for ongoing management. Surveys have covered: field layer vegetation, trees and shrubs, birds, moths, butterflies and beetles (see Appendix 2). There have been no professional studies of pollinators such as ants, bees, wasps (Hymenoptera), hoverflies or other flies (Diptera), or of spiders (Arachnida), or mammals, or of bryophytes or lichens. Generally, surveys have found that the woodland is ecologically relatively rich and is of significant wildlife conservation value, and reports of these have made specific recommendations for future management.

### 1.13 Woodland flora and fungi

The flora of the woodland's field layer is generally considered to be the most important aspect of its ecology aside from its woodland structure, older trees and a few specific fauna and flora.

The 1995 'Howe Park Wood Vegetation Survey' by Dr Joanna Francis recorded 174 vascular plant species within the Wood. Of those recorded, 31 are Ancient Woodland Indicator (AWI) species, comprised of seven AWI trees and shrubs and 24 AWI field layer species. These included strict ancient woodland specialists such as Herb-Paris *Paris quadrifolia*, Wood Anemone *Anemone nemorosa*, Early-purple Orchid *Orchis mascula* and Greater Butterfly-orchid *Platanthera chlorantha*. Unlike Linford Wood, Howe Park Wood did not contain the AWI Yellow Archangel *Lamium galeobdolon*. The 1995 Survey contains a list of all the plant species with a thorough analysis of the characteristics of the woodland flora and its relationship to this historic woodland. A full summary of

this report is provided in Appendix 2. It also contains maps of the distribution of many tree, shrub and other plant species, including seven rarer field layer species. The report found that the amount of deadwood was relatively low, with a mean coverage of only 10%, though this was more than the very low figure in Linford Wood of 5.9%. It also found that the cover of persistent leaf litter in Howe Park Wood is generally low, with a mean of only 17%. It was noted at the time that this was largely correlated with areas with a high percentage of Pedunculate Oak found within them.

As many areas of the woodland tend to hold water, mosses and liverworts (Bryophytes) cover substantial area of the woodland floor, an average of 56% cover (compared with 39% in Linford Wood).

When a survey of fungi was carried out across Milton Keynes in 1982 and 1983 ('A Survey of the Larger Fungi 1982-1983, by NJ Osley) the richest site for fungi was Linford Wood which held 114 species, but Howe Park Wood held 46 species, of which 11 were recorded there and nowhere else by this survey. This lower number cannot be attributed only to the smaller size of Howe Park Wood (60 acres compared with 97) but it was suggested that this might relate to the dense understorey with bare soil and sparse leaf litter and less coppicing than at Linford Wood. The surveyor expressed particular disappointment at not finding two fungi specifically associated with Hornbeam *Carpinus betulus*.

## 1.14 Insects

### 1.15.1 *Lepidoptera*

Initial studies of Howe Park Wood's butterflies (*Lepidoptera*) and moths were carried out in 1981 as part of wider studies of Milton Keynes. Two further studies were carried out around two decades later, of six sites including the three semi-natural ancient woodlands: these studies were of moths in 1999 and butterflies in 2002/03.

### 1.15.2 *Moths*

The 1999 survey of moths found more species and higher numbers in Shenley and Howe Park Woods than in Linford Wood. 217 moth species were found in Howe Park Wood, compared with 225 in Shenley Wood and 199 in Linford Wood. More of the species found in Howe Park Wood were non-woodland species, which may reflect the extent of grassland edges to much of this wood and that development around it was less advanced. Moths found in Howe Park Wood included two rarer species of Notable B status and 27 of Nationally Local Status. In addition, six other species were found that are relatively uncommon elsewhere in Buckinghamshire.

### 1.15.3 *Butterflies*

Howe Park is the most important woodland habitat for butterflies in the Milton Keynes area. By 2015 27 species were been recorded in and around the wood. compared with only 17 when extensive surveys were carried out in 2003 and 2004. As context a similar number of species are found in the much larger Salcey Forest to the north of Milton Keynes.

The Howe Park species list includes White Admiral *Ladoga camilla*, Purple Hairstreak *Quercusia quercus* and Black Hairstreak *Satyrium pruni*. Of these the latter is the rarest and most important as in the UK it only occurs in the Midland woodland belt and is restricted to 30 or 40 separate sites.

The Black Hairstreak is a sedentary species which has only limited capacity for colonisation of new sites. It occurs in woodland and hedgerow sites with Blackthorn *Prunus spinosa* in a narrow band between Oxford and Peterborough. Until recently, the only known population in Milton Keynes was in Howe Park Wood where the butterfly has been found in two distinct areas. One of these sites is the mature, north-facing Blackthorn thicket which runs alongside the bridleway on the northern edge of the Wood (Compartment 1) and the butterfly is seen here in low numbers annually. Another colony at the southern end of the wood appears to have been lost before 2014. In 2013 and 2014 Black Hairstreak were also seen at Oxley Mead SSSI, approximately 3km away and there was a solitary sighting along the North Bucks Way near Oakhill Wood in 2008. Historically the species was also found in Linford Wood but has not been recorded there since the 19<sup>th</sup> century.

Other woodland specialist butterflies found include Purple Hairstreak *Favonia quercus* (which requires mature Oaks), White Admiral (which feeds on Honeysuckle *Lonicera periclymenum*) and Silver-washed Fritillary *Argynnis paphia* which has re-colonised the Wood after many years' absence and whose foodplant is the Common Dog-violet *Viola riviniana*.

Since 2013, a weekly Butterfly Transect has been walked at Howe Park Wood by volunteers. The transect route encompasses much of the wood itself and also the wildflower meadow to the immediate north. Over a period of time, the results of this transect will build up a picture of butterfly population trends at Howe Park Wood.

#### 1.15.4 Other invertebrates

The importance of deadwood ecology has become increasingly recognised by ecologists and woodland managers. A 1996 study of beetles ('A Survey of the saproxylic Coleoptera of Howe Park, Linford & Shenley Woods' by Colin Plant) found 141 beetle species in Howe Park Wood (compared with 132 in Linford Wood and 165 in Shenley Wood) including five saproxylic species, one of which, *Ischnomera caerulea*, was a Red Data Book species (RDB3) and the other four were all of Notable B rarity status. Two other non-saproxylic beetle species of national importance (Notable B) were found, one a longhorn, *Phytoecia cylindrica*, the other a leaf beetle *Longitarsus parvulus*. That study recommended further study of fly species, such as hoverflies (Diptera), and bee and wasp species (Hymenoptera). The survey concluded that there was a need to increase the resource of standing and fallen deadwood in Howe Park Wood and the other woods.

### 1.15 Birds

Common Bird Census surveys carried out in 1984, 1987, 1993 and 2007 found fewer species than might be expected for this size of ancient woodland, even allowing for decline in particular species nationally. In 1987 the number of bird species breeding in Howe Park Wood was 36, compared with 35 in Shenley Wood and 27 in Linford Wood (a much larger wood). A later survey in 2007 showed a decline to 26 breeding species in Howe Park and Shenley Woods and some recovery in Linford Wood to 28. These figures reflect national declines in woodland bird species, such as: Starling, Cuckoo, Turtle Dove, Lesser-spotted Woodpecker, Willow Tit, Mistle Thrush, Spotted Flycatcher, Tree Sparrow, House Sparrow and Yellowhammer; but the differences between these three woods may reflect more local factors such as stage of urbanisation of their surrounding areas and differences in the stage reached in management practices in each of the woods. Willow Warbler numbers had also declined, but it favours large glades, broad rides and woodland edges of scrub and coarse grasses which are not well represented in Howe Park Wood.

Further comparisons were made by the Common Bird Census carried out in 2007. This showed that in Howe Park Wood the 26 breeding species then present included, in very small numbers:

- Two National Biodiversity Action Plan species – Bullfinch *Pyrrhula pyrrhula* and Song Thrush *Turdus philomelos*.
- Three Red List Species of Conservation Concern – Marsh Tit *Poecile palustris* as well as Bullfinch and Song Thrush.
- Four Amber List Species of Conservation Concern – Dunnock *Prunella modularis*, Goldcrest *Regulus regulus*, Woodpecker *Picus viridis* and Stock Dove *Columba oenas*.

A further explanation of this Common Bird Census can be found in appendix 3.

### 1.16 Bats and other mammals

#### 1.17.1 Bats

Recent Bat surveys conducted by Bernwood ECS in 2010 (associated with the construction of the Passive House on the south side of the Wood, as the original cottage on this site was a known bat roost) identified the following species using the Wood: Brown long-eared Bat *Plecotus auritus*, Pipistrelle *Pipistrellus pipistrellus*, and Noctule Bat *Nyctalus noctula*.

Twenty-four bat boxes were installed in 2012 as part of the mitigation scheme associated with the construction of the Passive House. The bat boxes will be checked regularly from 2015 onwards as part of an ongoing maintenance programme.

### 1.17.2 Other mammals

Bernard Frewin of the Milton Keynes Natural History Society carried out extensive monitoring of mammals from the end of the 1960s to the mid-1970s, which he reported in 'Records of Mammal Population, Distribution & Activity in Howe Park Wood: 1969-1974'. This is summarised more fully in Appendix 5. He found, or found evidence of: Mole *Talpa europea*, Common Shrew *Sorex Araneus*, Pygmy Shrew *Sorex minutus* (uncommon: by ditches at edges of the Wood), Water Shrew *Neomys fodiens (bicolor)*, Fox *Vulpes vulpes*, Stoat *Mustela ermine*, Weasel *Mustela nivalis*, Muntjac Deer *Muntiacus reevesi*, Hare *Lepus europaeus*, Rabbit *Orytolagus cuniculus* (particularly in areas bordering the stream), Grey Squirrel *Sciurus carolinensis*, Harvest Mouse *Micromys minutus*, Wood Mouse *Apodemus sylvaticus*, House Mouse *Mus musculus*, and Bank Vole *Clethrionomys glareolus*. No Short-tailed Vole *Microtus agrestis* were caught inside the wood, though two were trapped in nearby hedgerow. Badger *Meles meles* are generally considered infrequent visitors to the wood. There was an old Badger sett, known to have been active in 1968 but not after this date. This sett became active again in 2014, as the car park off the H7 Chaffron Way was closed to allow construction of the visitor centre. This sett will be continued to be monitored for activity.

No survey has been undertaken of terrestrial mammals in Howe Park Wood since the 1970s, so there are no comprehensive records of small mammals that may be now present in these woods. As with most woodland in Milton Keynes, introduced Muntjac deer *Muntiacus reevesi* are present, although rarely seen. Muntjac can cause considerable damage to young trees and also wild flowers in woodland. Recently, Roe deer *Capriolus capriolus* have recolonized the wood. This native species has been extending its range in North Buckinghamshire and is now present in the larger woodlands around Milton Keynes. It can sometimes be seen grazing the grasslands around the wood in early morning.

Grey Squirrels *Sciurus carolinensis* are present in large numbers and cause significant damage to trees by bark stripping. They also have a negative impact on the wider ecology of the wood, for example, by raiding bird nests. There is a Badger sett located close to the woodbank in the north-west compartment of the wood. Inactive for several years, this sett became active again around 2012, with low numbers of badgers present, when the nearby path and car-park were closed during construction of the education & visitor centre. Other mammal species still known to be present in the wood are Weasel and Hedgehog *Erinaceus europeaus*.

### 1.17 Amphibians and reptiles

There are several well-established ponds in and around the Wood and all of these support some amphibian life. The locations of these are shown on *Plan 6*. Several of the woods ponds (if not all) and their surroundings support the protected Great Crested Newt *Triturus cristatus* as well as other amphibians including the Common Toad *Bufo bufo*.

Grass Snakes *Natrix natrix* is also a known resident of the wood and its immediate surroundings, although details of its presence in and around the wood is limited.

The pond located in Compartment 3b of the wood has suffered in recent years from regular dog activity. This pond is an important breeding site for Great Crested and Smooth Newts and Common Frogs and also holds nesting Moorhens. As the only open pond in the wood it is also significant for dragonflies with species like Brown Hawker *Aeshna grandis* and Southern Hawker *A. cyanea* present. However, the condition of the pond has deteriorated with increasing turbidity and much reduced marginal vegetation on its southern bank, both caused by dogs.

As part of mitigation works associated with the building of the energy efficient house (Passive house) on the woods south west edge, the pond found on the edge of s/c 1d was re-profiled with a view to it accepting and holding storm water generated from the Passive House, with a view of making it better newt and amphibian habitat.

### 1.18 Site of Special Scientific Interest

In 1994 Howe Park Wood was 'notified' by English Nature (now Natural England) as a Site of Special Scientific Interest (SSSI) under Section 28 of the Wildlife and Countryside Act 1981. SSSIs are selected in accordance with criteria and processes set out in 'Guidelines for the Selection of Biological SSSIs' (JNCC 2013): a copy is provided at Appendix 3.

The entire 21.4 ha (60 acres) of Howe Park Wood was included in the SSSI Notification in 1994, but not the non-woodland edges and parkland surrounding it. The citation describes the Wood and sets out the reasons for its notification: a copy is provided in Appendix 3 with a link to a map of the boundaries. This covers its: history, woodland type as semi-natural ancient woodland, range of vegetation, and moth and butterfly diversity. It lists many of the distinctive plant and animal species and specifically names four moths and four butterflies, including: White Admiral *Limenitis camilla*, Purple Hairstreak *Thecla quercus*, “the nationally scarce” Wood White *Leptidea sinapsis* and the “nationally rare” Black Hairstreak *Satyrium pruni*.

As part of a SSSI notification, Natural England is required to provide a list of operations requiring their consent. A copy of the list of 23 standard operations applying to Howe Park Wood is presented in Appendix 3, under the heading ‘Operations likely to damage the special interest of a site’ (OLDSIS). None of the listed operations can be carried out without Natural England’s prior written consent.

In the ‘Notified Features’ appended to the SSSI citation, specific reference is made to “populations of nationally-scarce butterfly species – Black Hairstreak”, but also to: W10 *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland and to W8 *Fraxinus excelsior-Acer campestre-Rubus fruticosus* woodland. W10 and W8 are National Vegetation Classification categories, so inclusion of these as ‘Notified Features’ makes clear that Howe Park Wood was selected for its overall woodland characteristics and complex of plants and associated species. It should be noted that the 1995 ‘Howe Park Wood Vegetation Survey’ identified Howe Park Wood as primarily of sub-communities of NVC W8 with some of W22, but none of W10, though twelve different stand types were found through the 1995 quadrat surveys; these were: W8, W8a, W8b, W8c, W6d, W7, W9a, W21, W21b, W22, W22a, W22b, W24a.

Natural England carries out a condition survey of each SSSI every few years. A copy of the 2010 condition survey for Howe Park Wood is also included in Appendix 3.

### 1.19 Legislation and Protected Species

#### *Legal protection*

Legal protection is provided for some species and habitats found in Howe Park Wood, under:

- The Wildlife and Countryside Act 1981 (as amended)
- The Countryside & Rights of Way Act 2000
- The Conservation of Habitats and Species Regulations 2010
- The Countryside & Rights of Way Act 2000.

It is an offence to take, damage or destroy the nest of any wild bird while that nest is in use or being built. All wild birds, their eggs, nests and chicks are protected from disturbance, whether “intentionally”, or by “reckless disturbance” (an additional offence under The Countryside & Rights of Way Act 2000).

Other animals are provided with protection, as listed in Schedule 5 of the Wildlife and Countryside Act 1981, which includes protection from injury and death, from being taken from the wild, and for the places they use for shelter, as well as protection from disturbance to an animal occupying such a place. This applies to: Common Frog, Toads, all Newt species and a number of other relevant species.

#### *Bat protection*

All of the UK’s bat species enjoy full protection under UK and European law. Under the Wildlife & Countryside Act 1981 it is an offence not only to take, injure or kill bats but also to wilfully damage their roosts and habitats, and to “cause reckless disturbance” to such Protected Species. It is essential that all woodland operations in Howe Park Wood take account of the requirements of bats.

#### *Great Crested Newt protection*

Several ponds and their wider surroundings in Howe Park Wood support Great Crested Newts, and these are legally protected amphibians.

## **Public Access**

One of the primary objectives of Milton Keynes Development Corporation was to enable extensive public access through the woodland and this objective has been continued by The Parks Trust. The accessibility of the wood, along with the proximity of the education and visitor centre, enables regular users and occasional visitors to view and experience the mature woodland in a variety of ways, informally or on organised visits. The network of paths with their associated ditches allows access while reducing pressures on areas off the paths.

Initially, access was achieved by installing a network of paths (*Plan 4.*) with three types of surface, these being: metalled (tar spray and chip), grass and woodchip. The footpath layout allows users a choice of walk and length of visit. There are also un-adopted horse riding trails that run alongside three sides of the wood, which are surfaced with wood chip and connect to the city's larger 'highway adopted' (MKC owned) bridleway system.

Deep ditches on both sides of the metalled paths and rides help keep those paths relatively dry but also limit public access to some areas of woodland, so that the woodland its plants and associated wildlife can benefit from limited intrusion.. The woodland paths connect to the city's network of adopted Redways, managed by Milton Keynes Council, which provide for pedestrians and cyclists. These are found along the north-eastern and western flanks of the woodland.

The length of woodland paths found within the Howe Park Wood management plan are as follows:

- Tar-spray and chip footpaths (2-3m wide): 1,942 linear metres.
- Woodland paths -unsurfaced or subsequently surfaced with woodchip (2 - 3m wide): 2330 linear metres.
- Horse-riding trails (generally hogging surfacing and 2 -3m wide): 1603 linear metres.
- Surrounding hard surfaced MKC owned redways (3 metres wide): 941 linear metres.

Benches and picnic tables were also installed to provide focal points. There are a total of 15 wooden benches found at various points beside the various paths within the area of Howe Park Wood management plan (*see Plan 5*).

### **1.20 Management of anti-social activities**

In any such woodland, some anti-social activities take place which have to be managed. Dropped litter is picked up on weekly and monthly cycles of varying intensity (fewer in winter, more in summer), supplemented by volunteer litter-picking and action by Rangers when more significant littering or dumping takes place. Woodland like this can also attract illicit camping or fires, creation of unregulated paths, all of which the Trust's staff address. Although not all damaging activities are a result of deliberate anti-social behaviour. Inappropriate use of the wood needs to be assessed and monitored. This may include people creating informal tracks through the main body of the wood or dogs swimming/jumping on a regular basis in newt ponds and the need to understand the impact of such activities.

### **1.21 Education and Visitor Centre**

From the 1990's Howe Park Wood has periodically been used for informal education activities with local schools and community groups. The woodland setting is ideal for studying comparative habitats, specific genera and for generally experiencing the natural world. The Wood is used for activities such as guided walks, pond dipping and school visits. In 2012 a 'Forest School' Project was started within Howe Park Wood by a local nursery school with the support of The Parks Trust.



In 2014, an education and visitor centre was built to provide a focal point for environmental education activities and to raise awareness of the natural history both of Howe Park Wood (and its SSSI status) and more generally of the natural history of Milton Keynes and the work of The Parks Trust. This was the first general visitor facility for the public operated by The Parks Trust.

**Picture 3;** *The Howe Park Wood Visitor and Study centre, opened in early 2015.*

The centre comprises two education rooms, each accommodating up to 30 children (or fewer adults), toilet facilities, a small kitchen, a storage area and an ancillary room leased to the ambulance service (this will help improve the security of the building). There are features of environmental technology such as PV Panels, air source heat pump and low water-usage taps which can be used to demonstrate sustainable energy and resource use. Externally, the centre is constructed with integral bird nesting boxes and insect habitat boxes which will provide an additional educational resource. There is also a newly constructed pond dipping platform to enable access to the adjacent pond for study. The centre is intended to be a base for the following activities:

- Curriculum support education activities for schools
- Community education
- Community events
- Adult education
- Practical Volunteering activities
- Room hire for natural history groups to host meetings
- Birthday parties / corporate activities with a natural history theme
- Information / interpretation about the woodland and the natural history of Milton Keynes in general.

These activities will be run both by The Parks Trust and in partnership with other similar organisations such as The Wildlife Trust, Milton Keynes Natural History Society, RSPB and Field Studies Council.

The introduction of a visitor facility will increase visitor numbers to the site, both through organised visits and informally through the provision of facilities such as toilets and refreshments. The sensitivity of the main woodland will require visitor management strategies to ensure that undue pressure is not placed on any habitat. This will involve limiting access to certain areas, which will include seasonal restrictions. Information and interpretation signage as well as waymarking will be installed to assist with this.

A series of Ecological Studies have been conducted and are made available on request for those wanting to understand the ecology of the woodlands more fully. Those relating to Howe Park Wood are listed in Appendix 2 and all titles are listed on The Parks Trust's website.

## Section 2: Aim and Objectives

### 2.1 Aim

The management aim is to maintain and enhance Howe Park Wood's character, nature conservation interest, recreational value and visual amenity, while improving the educational opportunities the woodland and its environment offers.

This overall aim is to be achieved by pursuing the following complementary objectives. A fundamental requirement of any implementation is that any works or operations carried out should fulfil as many of these objectives as possible and not focus on achieving individual aspects in isolation.

### 2.2 Objectives

- 1) **Nature conservation and Ancient Woodland:** To maintain, extend, enhance and monitor the diversity and continuity of habitats within the wood, particularly those necessary to retain the rarer species of flora and fauna associated with its ancient woodland structure and to protect and promote the essential characteristics of this woodland as a Site of Special Scientific Interest. A limited range of woodland products should also be a consideration of management and will be produced as by-products of woodland management, and be consistent with achieving all the other objectives.
- 2) **Woodland character, landscape value and visual appeal:** To protect the overall landscape value and visual appeal of Howe Park Wood and promote the essential character of this semi-natural ancient woodland, while continuing to develop the surrounding landscape in ways that are sympathetic to the woodland and ensure the woodland is ecologically and visually connected to the surrounding landscape and open space.
- 3) **Access and recreation:** The woodland and its environs are to function as a distinctive part of the overall park provision in the western flank of Milton Keynes and to provide public access via paths which exploit a variety of woodland settings and which link to recreational through routes and the wider countryside. The woodland should have well-connected to entry points such as car parks and public transport stops. The woodland should offer an accessible, stimulating and varied environment for people's relaxation and enjoyment.
- 4) **Education:** Howe Park Wood should be used as an educational resource and provide information to assist this objective. Whilst the priority will be encouraging knowledge and understanding of Howe Park Wood and its surrounding environment, the education and visitor centre will be a valuable educational resource that can be used by people across the city and surrounding area. The centre will facilitate wider understanding of the biodiversity, history and amenity of other valued sites in the city as well as a broader understanding of the green estate and the work of The Parks Trust.



### Section 3: Assessment and Management Prescriptions

**Objective 1. Nature conservation and Ancient Woodland:** To maintain, extend, enhance and monitor the diversity and continuity of habitats within the wood, particularly those necessary to retain the rarer species of flora and fauna associated with its ancient woodland structure and to protect and promote the essential characteristics of this kind of woodland as a Site of Special Scientific Interest. A limited range of woodland products should also be a consideration of management and will be produced as by-products of woodland management, and be consistent with achieving all the other objectives.

**Objective 2. Woodland character, landscape value and visual appeal:** To protect the overall landscape value and visual appeal of Howe Park Wood and promote the essential character of this semi-natural ancient woodland, while continuing to develop the surrounding landscape in ways that are sympathetic to the woodland and ensure the woodland is ecologically and visually connected to the surrounding landscape and open space.

The essential ecological character of these woodlands is primarily as semi-natural ancient woodlands with an assemblage of trees and flora characteristic of the NVC W8: *Fraxinus excelsior-Acer campestre-Mercurialis perennis* type of woodland and of W22 in compartment 1. Continued management of these woodlands should be done in ways that protect the distinctive ancient woodland trees and enhance growing conditions for its flora, which includes flowering plants, grasses, sedges and rushes, mosses, fungi and lichens. Another important aspect of ancient woodland is the sustained activity of particular mycorrhizal associations between specific fungi and the roots of specific tree and other plant species. This will be best sustained by natural regeneration.

The woodland has a known assemblage of breeding birds which is relatively limited for this kind of woodland, possibly because of its limited connections with surrounding countryside and urban green corridors, but also because of its neglect in the early 20<sup>th</sup> century and the necessity of disruptive restoration management for some decades from the 1970s. There have also been downward trends nationally for some woodland bird species. Reinstatement and coppicing work carried out over the last 30 years should enable the number of breeding bird species in these woodlands to be maintained or even increased and for this to be a specific management aim for future woodland management.

Bats, various other mammals and amphibians are all present in the wood, and Grass Snakes *Natrix natrix* may also be present. Operations undertaken should take all these species into consideration and opportunities should be taken to conserve or increase habitat potential for these and other species by such measures as: retaining deadwood and trees with habitat potential, and maintaining ponds appropriately. Operations should also maintain the wood in mixed layers, for example by providing non-intervention and other scrub areas, irregular forest, coppiced areas of various ages, areas of grassland, and by channelling public access away from certain sections of the woodland.

One objective over recent decades has been to leave some trees to age in ways that increase niches for woodland invertebrates and particularly for saproxylic species for which rot-holes, red-rot, dying trees, fallen deadwood and fungi are essential. Achieving a well-balanced age-structure of trees will ensure a continual progression of ageing trees which have these assets. Holes and cracks in trees are essential for several bird species and many bats. A dense woodland floor including rotting leaf-litter can benefit many of the smaller invertebrates at the base of the food-chain, such as springtails (*Collembola*), so providing food for larger invertebrates such as ground beetles and for animals such as birds and mammals further up the food-chain.

Much ecological monitoring and survey was carried out in these woods by the Development Corporation when they needed to understand the ecological character of the woods to guide their woodland management. Now that a more settled state has been reached in the life of the woodland, further monitoring will be needed to establish what progress is being achieved and to provide more

specific information to shape future plans for woodland operations. This information will also have an educational value.

### **3.1 Implications of 'Ecological Studies in Milton Keynes' reports**

From the mid-1970s Milton Keynes Development Corporation (MKDC) commissioned ecological reports that were published as 'Ecological Studies in Milton Keynes' and The Parks Trust has continued the series. Thirteen of these Ecological Studies are primarily about Howe Park Wood or contain substantial content about it. A further nine studies have content which includes Howe Park Wood. The full list of these studies up to 2009 is provided in Appendix 2 'Reports and Publications'. In Appendix 3 a summary is provided of most of these studies and their specific recommendations for management of the woodland. These recommendations were considered at the time and many of them have influenced subsequent site management, though in some cases competing proposals had to be prioritised. The preparation of a new management plan is a good opportunity to review these recommendations to see if they shed fresh light on the management of the woodlands. Surveys have covered: field layer vegetation, trees and shrubs, birds, moths, butterflies and beetles. Issues raised by these studies are addressed in what follows.

### **3.2 Site of Special Scientific Interest**

Management of this woodland must comply with its legal status as a Site of Special Scientific Interest. Natural England provides a statement specific to each SSSI called 'Views About Management' (VAM). A copy of their full VAM for Howe Park Wood is attached in Appendix 4 but this is not a substitute for specific consent for operations listed in Natural England's 'Operations likely to damage the special interest' (OLDSI). The VAM includes, amongst other points, that there should be:

- a range of tree ages and species within and between stands
- some dead and decaying wood, which is essential
- open spaces to benefit invertebrates: temporary gaps after felling of coppicing, and permanent rides and glades (which may require cutting to keep them open)
- use of felling, thinning or coppicing to create or maintain variations in the structure of the Wood (normally best done end of August to end of February to avoid disturbance to breeding birds)
- successive thinning or coppicing operations which should be spread spatially to avoid too much disturbance in one area, unless open space in adjacent plots is needed to encourage spread of weakly-mobile species
- wet woodland by streams best left undisturbed
- natural regeneration from seed or stump regrowth rather than planting, to help maintain the inherent genetic character of the site.

### **3.3 Management of Ancient Woodland**

An Ancient Woodland of this kind – NVC W8: Ash-Field Maple-Dog's Mercury, wet woodland on clay – requires careful management of light and shade levels and the woods hydrology. The most important aspects relating to its age are to maintain the Ancient Woodland Indicator flowering plants and other significant plants in the field layer, and a management regime to sustain shady and sunlit areas in a progression relating to coppicing of underwood and maintenance of the tree canopy. To achieve this a balanced age-structure of the over-storey of canopy trees, as well as permanently lighter areas along rides and paths is required.



**Picture 4;** *Mixed tree species and age classes, offering fantastic Biodiversity features in an attractive setting.*

There is a need to minimise trampling of the ground flora and soil compaction, which can be difficult to achieve when coppicing and scrub management is carried out.

Management of the woodland trees should continue to use the traditional system of coppice with standards which incorporates irregular shelterwood with mixed age/size classes that includes non-invention belts and areas. In essence, work will be undertaken on an approximate 15 year cycle and in each worked compartment appropriate sections of understorey will be coppiced, while leaving selected areas as non-invention belts (with scrub habitat value).

Upper and middle canopy trees will be removed as required, allowing:

- The development of retained canopy trees, with middle and lower storeys
- Varied intensities of light to be available to the ground layers
- Ecological factors (e.g. mixed aged trees and varied habitat layers) to develop
- Health and safety considerations to be applied.

In 1984, Cobham Resource Consultants (CRC) were commissioned by MKDC to conduct a 'Vegetation Survey of Howe Park Wood'. Management recommendations from CRC's 1984 report, 'Howe Park Wood Management Plan 1985-1989' concluded:

- 1) "The woodland should be retained as an important habitat and managed to maintain the species richness already present;
- 2) Any management policies must guard against invasion of blanket species as these are detrimental to management aims;
- 3) Re-introduction of coppice with standards management to the different stand types would greatly diversify the woodland. This would give a wide range of age groupings within the coppice as a whole, due to differing lengths of rotations between coppice species as well as encouraging a different ground flora."

The implementation of thinning, felling and coppicing operations requires licence approval by the Forestry Commission (FC) under the terms of Section 10 of the Forestry Act 1967. The inclusion of the woodland within the FC English Woodland Grant Scheme (EWGS) exempts the Trust from applying for a separate licence as long as the proposed felling works are included in a FC approved 'Plan of Operations'. EWGS contracts are for a five year period and the current scheme for Howe

Park Wood was approved in September 2011. In accordance with standard practice, Howe Park Wood is divided up into working compartments (*Plan 3*). EWGS approved thinning and coppicing compartments for the five years up to 2016 were 1, 1a, 2, 2a, 2b, 3, 3a & 4. This seems quite extensive but the areas covered, particularly in compartments 2, 3 and 4, were only small sections of the overall compartments. All ride-side and woodland edge coppicing and thinning works was also approved under the terms of the current EWGS contract.

As part of the Common Agricultural Policy (CAP) 2014 reform and subsequent measures, the EWGS is being replaced a Countryside Stewardship (CS) scheme that includes; woodland grant funding and issuing of felling licences. This is administered by the Forestry Commission (FC) and at the time of writing this management plan (July 2015) The Parks Trust are applying to include Howe Park Wood (and other mature woodlands) in the scheme. The FC compartment numbers that are used for reference in this scheme can be found on *Plan 3*.

### 3.4 Canopy trees

Howe Park Wood is predominately Ash woodland with Pedunculate Oak, Field Maple, Aspen and Hornbeam all present. Many of the mature Ash have evidently been recruited from previously coppiced stools and have basal cavities. In the management plan of 1993 it was described as silviculturally understocked.

Cobham Resource Consultants' 'Vegetation Survey of Howe Park Wood' provided an inventory with the following percentages of woodland trees and scrub encountered in 1984:

• Ash	47%
• Thorn, Hazel, Sallow and other scrub species	23%
• Field Maple	14%
• Aspen	9%
• Oak	4%
• Hornbeam	3%.

Oak was present only in large sizes or poor form except for a few one-year seedlings. Ash was in a "healthy range of sizes". Hornbeam and Field Maple were mainly in larger sizes though there were a few pole-size Hornbeam, and a few previously-pollarded Hornbeam. Aspen regeneration was prolific in places but generally at pole stage age, which required thinning. Scrub growth was prolific and tall in many cases.

A silvicultural assessment shows that the Wood has been managed for several centuries, with varying degrees of intensity, as coppice (Hazel, Ash, Field Maple and Hornbeam) with standards (Oak and Ash). Most of the standards were removed in either the 19<sup>th</sup> or 20<sup>th</sup> centuries, with the exception of some Ash high forest and retained large coppice stools. Over the hundred years to 1984, coppice and logged-out areas were left untended. In some areas this led to prolific Ash and Aspen regeneration. The oldest of the Aspen appear to date from the early 1950's and are probably due to cessation of grazing by rabbits following their virtual eradication due to myxomatosis. Regeneration of Hornbeam and Field Maple in woods is common but of Oaks is rare. In some parts of the Wood, scrub species (such as Sallow, Willow, Hawthorn and Blackthorn) suppressed other growth. The overall result was poor quality in the growing stock of trees regarding overall form, crown shape and poor stem development.

The remnant Oak standards are thinly scattered through the wood. The Hornbeam are generally found as pockets of standards and as over-mature coppice. Field Maple are found as multi-stemmed trees growing from previously coppiced stools but also, commonly, as large standard trees, which are an unusual feature of the woodland. The poorly drained plateau areas have pole stage thickets of Aspen which contain varying proportions of Goat Willow *Salix caprea* and Grey Willow *Salix cinerea* (Common Sallow),

The shrub layer is dominated by Hazel in some areas and Blackthorn in others. Hawthorn, Dogwood, Goat Willow and Grey Willow are all common. Before management recommenced in the mid-1980's much of the Hazel coppice was over mature and moribund, similarly much of the Blackthorn was overtopped and dying, large areas were fallen or were in the process of collapsing.

The 1984 CRC 'Vegetation Survey' concluded that there should be a re-introduction of coppice and standards management to the different stand types. Since 1984 coppice and standards management regime has been undertaken on a regular and annual basis. As the report suggested this has helped further diversify the woodland and has provided a wider range of age groupings within the coppiced areas across the woodland to develop.

In the period from the mid-1980s to 2015 a major task has been to restore a woodland structure of well-spaced canopy trees of appropriate species, helping to provide the environment to create a diverse age-structure as well as development of the mature trees. This has been undertaken to help ensure the longevity of the woodland as mainly 'Coppice with Standards', which also promotes mixed age classes below the high canopy, with a few dense non-intervention areas, a mixed underscrub, and a deadwood resource.

### 3.5 Responding to Ash Dieback

The spread of Ash Dieback *Chalara fraxinea* across mainland Europe into the UK, makes it likely that the disease will arrive in Howe Park Wood relatively soon. Understanding the potential effects of this on the woodland is a waiting game but with such a large amount of Ash found in the Wood, there should be opportunities to remove some, to help retain and encourage other tree species as thinning and clearing work is undertaken. The arrival of Ash Dieback in Howe Park Wood (as in the areas other mature woods) is a real concern in the way it has the potential to totally change the area's feel and biodiversity of the woodland. Although at this stage there is no plan to remove a disproportionate amount of Ash trees (which account for over 47% of the upper canopy and a significant proportion of the understorey and coppiced areas) we will need through thinning and coppicing works to encourage and favour for retention other species that are appropriate and found in this type of semi-natural ancient woodland. This will be achieved by favouring tree species other than Ash when undertaking thinning or felling operations, to increase the percentage of other appropriate species in the upper canopy.

As Ash Dieback arrives at the wood there will be a need to assess individual trees to evaluate the best actions, which may be to: fell, manage the decline, or take no action, depending on such things as the extent of the disease, how quickly it takes hold and how far diseased trees are from paths, as well as any other constraints.

Depending how Ash Dieback affects Howe Park Wood, more Pedunculate Oak may needed to be planted in the wood. Pedunculate Oak are for various reasons seemingly under-represented in the Wood, so this could be seen as an opportunity to readdress this balance. Other appropriate species to replace diseased Ash are: Hornbeam, Aspen *Populus tremula*, and Field Maple; but also to a lesser extent Goat Willow *Salix caprea* (previously known as Great Sallow) and Grey Willow *Salix cinerea* (previously known as Common Sallow), all of which are present in the woodland in small numbers. Aspen is found in the woodland mainly in small groups or as the occasional individual. It is worth noting that Aspen is a foodplant of 44 moth and butterfly species (Lepidoptera) in Britain. Aspen should be retained as this, and other tree species that traditionally have been a minor element in some NVC W8 woodlands, might find opportunities to expand their numbers if Ash dieback has a catastrophic effect. Replacement trees of all species will be from seed sourced from the Wood, including acorns.

The spread of *Chalara fraxinea* and other diseases should be continuously monitored as analysis will need to be made of how it affects the Wood. The re-stocking strategy will need further analysis and potential modification at each five yearly review of the management plan.

### 3.6 Restocking of the Wood

Since the Parks Trust took ownership of the wood (and probably during the ownership of MKDC as well) there has been no planting of species non-indigenous to Howe Park Wood, this policy should continue. Undoubtedly, with diseases such as Ash Dieback, there will be a need to re-stock the wood. Re-stocking of the Wood shall take place through:

- The encouragement of natural regeneration or the use of layering (e.g. Hazel).

- There is a need to develop a population of young Oak in the Wood. As Oak acorns have difficulty in propagating in woodlands (one reason being lack of roaming pigs rooting around and accidentally burying the acorns) This will be done through gathering acorns from selected Oak trees within the wood, propagating them to plant in appropriate locations.
- Hornbeam may also need to be restocked in the wood. This will be done through gathering seed from selected Hornbeam (or stands of Hornbeam) in the wood, propagating, growing the seed on, then planting young Hornbeam back in the wood in appropriate locations. As a note of caution it is important that any re-stocking of Hornbeam is completed in proportion to current Hornbeam stocking levels, as the shade-casting properties of the Hornbeam can be detrimental to the Wood's ground flora.

When considering using alternative tree species to Pedunculate Oak and Ash (e.g. more Hornbeam), it must be remembered that although some ground flora AWI indicator plants tolerate shade, many are situated in more open conditions along paths and rides and flower early in Spring, when they benefit from the late-leaving characteristics of the main canopy species, particularly Pedunculate Oak and Ash. If disease were to substantially affect the viability either of these tree species in these woodlands, very careful consideration would need to be given to which alternative species are compatible with the light needs and other habitat requirements of AWI field layer flowering plants. For example Hornbeam tends to create heavy shade which may be incompatible with many plants found in the wood.

### 3.7 Coppicing of understorey, thinning of shrub layer and management of scrub

Restoration work involving thinning of trees and coppicing scrub and shrubs started in the mid 1980's and has helped strengthen the underwood by means of removing some of the upper canopy trees and coppicing the over-maturing shrubs, of which both actions consequently allow more light to reach the understorey. Planting of species such as Hazel *Corylus avellana*, which are suited to coppicing, has also contributed to the improvement of the understorey. Observations contained in the 'Vegetation Survey of Howe Park Wood' of 1984 (conducted by CRS) concluded that 'rotational coppice-with-standards' management is vital in maintaining a high number and diversity of species in this important woodland area.'

Part of the coppicing works includes working on self-set seedling Ash, which in parts of the wood is quite prolific. The self-set Ash have also been coppiced and thinned out, primarily to offer better light conditions to the understorey below and to allow the better Ash seedlings to grow on.

Dr JL Francis in her 1995 'Howe Park Wood Vegetation Survey' recorded that only 53% of sampled quadrats had more than 60% understorey cover and in many of these it was because they were dominated by Blackthorn scrub (in 74% of sampled quadrats) and Hazel (in 64%). Hazel was found throughout the Wood, but was virtually absent where Blackthorn was dominant. The other understorey shrubs were under-represented. There were four characteristic under scrub species found throughout the Wood: Bramble *Rubus fruticosus*, Dog-rose *Rosa canina*, Dewberry *Rubus caesius* and ground-growing Honeysuckle *Lonicera periclymenum*.

A prescriptive style of woodland management that has been implemented in Howe Park Wood is 'Coppice with Standards'. As part of the system used in the wood, management and treatments incorporate retention of some of the mid-storey, non-intervention areas and rotational scrub cutting. Coppice management and associated thinning is generally applied on an approximate 15-year cycle, targeting those areas where the coppice stool potential is high.

The 1998 'Effects of Coppicing' study made a specific recommendation, to assist conservation of some bird species by protecting them from a potential detrimental effect of coppicing. The recommendation was to leave a vegetation edge of shrubs and some trees, a few metres wide, where newly-coppiced areas were close to paths; and for small islands of denser shrubs and trees to be left within the heart of new coppicing. These would provide protective habitat and feeding areas for breeding birds. It was from this recommendation that 'non-intervention' areas or 'belts' were introduced to the wood, as part of a working/management practice.

It is vitally important that re-creation of 'Coppice with Standards', incorporating mixed age classes and non-intervention belts, should be continued. Dr JL Francis in the 1995 'Howe Park Wood Vegetation

Survey' (Ecological Study No. 132) explained that the existing Blackthorn *Prunus spinosa* community should be maintained because of its importance for the two known populations of the rare Black Hairstreak butterfly found in the Wood, while also stating that the Blackthorn should not become so dominant that it leads to a reduction in overall species diversity in the Wood. A difficult balance has to be struck with scrubby shrub species such as Blackthorn and Bramble as they can dominate and spread to the detriment of other species and the growth of young trees, but they are an essential part of the habitat for birds and insects (including Black Hairstreak Butterfly) providing shelter, shade, nest sites and food sources.

In wetter areas Willow species, that are appropriate to such areas in this type of woodland are found. Goat Willow *Salix caprea* and Grey Willow *S. cinerea* should be retained and managed by coppicing and by letting elements of them mature. A few can be left to over-mature even if they start collapsing, as even these can benefit biodiversity.

### 3.8 Veteran, declining, dead and dying trees

Often, small and isolated woodland units that have previously received little or no management over previous years tend to be dominated by trees or layers which are all, very broadly, of equal age, which has serious implications for a consistent stock of decaying timber to benefit a wide range of biodiversity.

Several studies of the city's woodland have emphasised the lack of deadwood and the importance of increasing this substantially. The issue is wider than deadwood found on the ground, as it applies to the need for more ancient, veteran and mature trees along with some younger tree to provide hollows, rot-holes, sap-runs and habitat on which fungi and plants can grow, in which hole-nesting birds can nest, and in which various specialist saproxylic beetles and hoverflies can live. The need is for dying and dead wood, both standing and fallen. A case was made for the felling of some younger and healthier trees – where they were not otherwise needed – to be left to rot on the woodland floor, and for old and dying trees to be left standing wherever possible. These principles and aims should be more commonly applied to Howe Park Wood.

Holes in trees are an absolute requirement for many species, ranging from some bird species to bats, mammals and insects. For example, one of the preferred nesting sites for Marsh Tit *Poecile palustris* is a hole less than 3m from the ground in trees or stumps. A proportion of old coppice stools should also be left even if they are no longer producing poles as these also provide valuable habitat. Fallen deadwood is an important substrate for many fungi, so consideration should be given to leaving fallen branches in such locations. Fires should be avoided wherever possible as they change the local habitat and certainly should not be used close to old coppice stools or fallen wood. Where they are unavoidable, consideration should be given to use of a raised fire platform.

The Forestry Commission publication 'Life in the Deadwood: A guide to managing deadwood in FC forests' states that dead limbs can be as important as trunks for saproxylics ... these should be left where fallen unless there is a significant risk to public safety; dead branches can also protect the sensitive rooting zone around veteran trees. Where possible fallen deadwood should be left where it falls. If deadwood has to be moved then it should be moved as short a distance as possible, preferably into dappled shade near rides or glades and near other deadwood.

Though any deadwood can be of value, CW Plant in his 1996 survey of Saproxylic Coleoptera of Howe Park, Shenley and Linford wood (ES No. 133b) states that "timber of a large diameter, both standing and fallen are especially important". He suggested that selected species of a variety of species, including large trunks of Oak *Quercus robur*, should be felled and left to decay, stating that "the richest fauna tends to be supported by material in partial shade".

To improve the Wood's biodiversity and apply the Trust's Biodiversity Action Plan (BAP) larger-diameter dead and dying trees (e.g. standing deadwood or crown die-back) shall, where possible and appropriate to the location, be left in situ, still rooted. This will comply with the BAP's Habitat Action Plan, HAP 01. and can be done in areas with limited public access, thus ensuring the environment is relatively safe for public use.

Large amounts of fallen and cut deadwood, particularly material of large diameter, will be left on the woodland floor and allowed to decay naturally. At least 50% of felled timber from the middle or upper

canopy should be left as deadwood habitat. As much as possible of this deadwood should be left in contact with the ground. The amount to be left in a particular compartment should relate to the extent to which it is deficient in deadwood resource. Provision needs to be made for assessment and recording of the overall veteran and deadwood timber resource at regular intervals (in the order of fifteen years).

### 3.9 Field layer

Seeds of Ancient Woodland Indicator (AWI) plant species are not generally found in the dormant seed store in the soil and these species are poor at spreading and colonising. Many of the rarer field layer species exist vegetatively in shady, undisturbed areas, but can proliferate for a while in recently-cleared areas before competition from other plants builds up. Some are maintained by the coppicing cycle but cannot readily spread; these include Early-purple Orchid *Orchis mascula*, Herb Paris *Paris quadrifolia* and Greater Butterfly-orchid *Platanthera chlorantha*.



The 1995 'Vegetation Survey' contains much important information about the plants of Howe Park Wood, including all the Ancient Woodland Indicator Plants, so needs to be consulted fully. A summary of it is included in Appendix 3. The species most widespread in the field layer, and found in over 60% of quadrats, can be divided into those associated with drier areas and those in wetter areas. The distribution of these species of dryer and wetter areas is uneven across the Wood because some areas hold water more than others.

**Picture 5;** Wood Anemone *Anemone nemorosa* colonising an area by one of the woodchip paths.

All the following field layer species found in Howe Park Wood are characteristic of NVC type W8 woodlands:

#### *Drier areas:*

- Bluebell *Hyacinthoides non-scripta*
- Hairy St John's Wort *Hypericum hirsutum*
- Dog's Mercury *Mercurialis perennis* (only in small, scattered populations in only two compartments, probably reflecting the wetness of most other areas of the Wood)
- Greater Stitchwort *Stellaria holostea*.

#### *Wetter areas:*

- Tufted Hair-grass *Deschampsia cespitosa*
- Pendulous Sedge *Carex pendula*
- Wood Small-reed *Calamagrostis epigejos*
- Rushes *Juncus spp.*

Another influence on the distribution of field layer species is the amount of light they receive, so some are concentrated along rides and paths (particularly those that are east-west and those without hard surfaces and ditches), others are hidden within more shaded areas. Dr Francis noted that a main



effect of increased woodland management since 1984 had been to raise light levels and increase plant diversity, though ground disturbance had also caused some ruderal (wasteland) species to proliferate.

**Picture 6;** Coppicing of the understorey along with thinning of the upper canopy has allowed light to get in to the field layer.

Seven rarer plants were present or locally abundant in Howe Park Wood. These were:

- Thin-spiked Wood-Sedge *Carex strigosa*
- Broad-leaved Helleborine *Epipactis helleborine*
- Dog's Mercury *Mercurialis perennis*
- Early-purple Orchid *Orchis mascula*
- Herb Paris *Paris quadrifolia*
- Greater Butterfly Orchid *Platanthera chlorantha*
- Goldilocks Buttercup *Ranunculus auricomus*.

Seven specific management recommendations were made on the basis of the 1995 survey. They were:

1. Maintenance of Blackthorn scrub  
The existing Blackthorn community should be maintained because of its importance for the two populations of the rare Black Hairstreak butterfly found in the Wood; but Blackthorn should not become so dominant that it leads to a reduction in overall species diversity in the Wood. The butterfly mainly requires bushes older than 20 years, so a continuity of this habitat with a range of age-classes is required and the continuing development of younger shrubs.
2. Maintenance of soil moisture levels  
It is important to maintain soil moisture levels on which many AWI species in W8 woodland, such as Lesser Celandine *Ranunculus ficaria* and various Sedge *Carex* species depend, particularly because some characteristic species of wet woodland would be more prolific if not shaded out by Blackthorn thickets.
3. Rare species  
All of the rare plant species in Howe Park Wood relate to coppiced woodlands, so should be capable of being sustained by continued rotational coppice management. Many of the rarer field layer species exist vegetatively in shady, undisturbed areas but can proliferate in recently cleared

areas before competing plants build up. Soil moisture levels are important for Thin-spiked Wood-sedge *Carex strigosa*, so need to be sustained along with suitable habitats for its growth including bank and ditch sides.

4. Control of Bramble *Rubus fruticosus*

In general, Bramble is less of a problem in most of Howe Park Wood than is generally the case elsewhere, though it has required control by regular cutting in the east of Compartment 2, and is controlled in some other areas by Blackthorn out-competing it. Bramble provides an excellent nectar sources for many invertebrates, but may need some limited management in some open areas.

5. Maintenance of ancient woodland characteristics

Management of Howe Park Wood should aim to maintain its special characteristics as a good example of W8 ancient woodland and as an SSSI:

- If chippings are used for paths they should ideally be from this Wood and not introduced from other sites.
- Avoid bonfires or site them where their damage to plants and soil enrichment will have least effect
- Ash and Hornbeam will naturally regenerate in this Wood
- Enhancement of Hazel should be by layering rather than introducing new stock
- Any further tree planting should be of stock of local provenance [i.e. from this ancient woodland or another nearby].

6. Deadwood

The practice of maintaining an ongoing range of types of deadwood in Howe Park Wood should be continued to benefit saproxylic invertebrates and a good range of fungi. The most valuable deadwood resources are: snags, standing deadwood and hollow trees, but fallen and felled deadwood is also of importance.

7. Visitors

Inevitably visitors have impacts on this woodland as they enjoy it. The reasons why this ancient woodland is special should be explained so that people understand how and why it needs to be respected and treated sensitively, and why particular management activities are carried out. This information could be conveyed on interpretation boards erected within the woodland. The Wood can also provide a very useful educational resource.

### 3.10 Climate Change resilience

A Forestry Commission Research Note 'Climate change: impacts and adaptation in England's woodlands' (2010: [http://www.forestry.gov.uk/pdf/FCRN201.pdf/\\$FILE/FCRN201.pdf](http://www.forestry.gov.uk/pdf/FCRN201.pdf/$FILE/FCRN201.pdf)) presents 'Factors to consider when managing ancient and native woodlands'. The most relevant of these to Howe Park Wood are:

- 1 "Wetter winters in the future could exacerbate soil compaction, rutting and erosion and may place additional constraints on operations.
- 2 Warmer and longer growing seasons will promote productivity and provide more food for herbivores, both invertebrates and mammals. Deer and rabbit populations will tend to increase in response to food availability and milder winters, requiring robust control measures in the future, particularly where natural regeneration is a priority.
- 3 Invasive species including ... grey squirrel, edible dormouse, rhododendron, laurel, Japanese knotweed and Himalayan balsam should be monitored as a warmer climate will promote expansion of their range/population.
- 4 Some non-native tree species may present a future risk of becoming invasive.
- 5 Coppice can improve resilience to drought as stools have deeper roots than regenerating seedlings and planted material, and coppiced shoots tend to have a higher vigour than young plants.
- 6 Natural regeneration is likely to be affected by climate change although this may vary from species to species.
- 7 Where the likelihood of increased colonisation of unwanted invasive species occurs, create buffer areas around core woodland where invasive species are absent, or remove small isolated

patches of invasive species if already present at the site. However, it must be remembered that climate change is driving species range shifts, and attempts to prevent natural colonisation may exacerbate woodland fragmentation in the future.

- 8 Avoid management that would result in a less wind-firm stand where frequent gales and wetter winters are likely to cause more damage.
- 9 Where impacts affect age structure through the mortality of older trees, release smaller trees to promote rapid development of the next cohort.
- 10 Long term change should be monitored, recorded and reviewed at regular (perhaps 10-year) intervals. Monitor the range of habitats, age range, vertical structure, deadwood, and field layer vegetation composition to provide evidence of long term change.
- 11 Ancient woodland could also provide a long term, resilient, resource for monitoring climate change impacts and the diverse range of species in native woodlands may provide some evidence to guide adapted species choice in other types of woodland.”

With changing climate, other pests and diseases may move into the area, so there will be a need to keep aware of such events to meet these challenges.

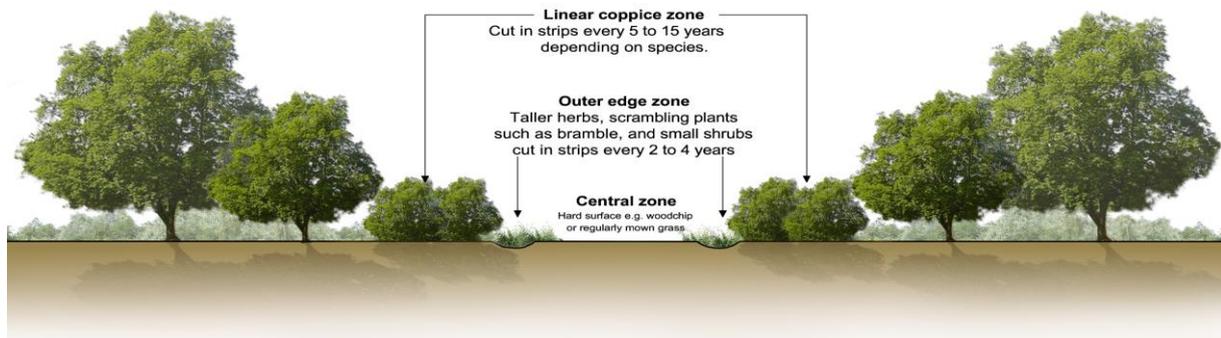
### 3.11 Rides and paths

Of the 174 plant species found in Howe Park Wood in the 1995 ‘Vegetation Survey’ 130 were recorded along rides and ditches, where there is more light. Mowing and clearing regimes in these areas should be maintained to conserve diversity of these species within these locations. For example, some of the rides provide examples of unimproved grassland with flowering plants such as Greater Bird’s-foot Trefoil *Lotus uliginosus* and Purple Loosestrife *Lythrum salicaria* both of which are attractive to insects. Ride cuts should not be intensive. A single cut of the grass in these locations in September would promote these plants better than frequent cutting.

Existing practice is to create uneven widths and heights to plants at the edge of paths and rides by leaving graded ‘scalloped’ areas. The purpose of this is to create broader sunlit areas in which flowering plants can thrive and insects such as butterflies can bask. It was thought desirable to create much larger clearances in some areas with the specific purpose of creating broad sunlit clearings to support more diversity of species.

To increase habitat value, while creating forward and side views for the wood users, the edges of rides and glades should be regularly cut (usually every two or three years) and coppiced to create and maintain a gradation from the field layer to low shrub and sub-shrub growth through to the woodland canopy (see diagram below). The edges will be cut following a scalloped style, usually ranging from a depth of 2 metres to 5 metres from path or ditch edges. Further opportunities will be sought to create greater depth to edge transition in some areas of the woodland (e.g. along the south side of compartment 1d).

To offer more light availability to paths and rides and associated transition edges (particularly those running on a west to east axis) a higher density of stems from the upper and middle canopies shall be removed, while looking for further edge scalloping/scalloping opportunities.



**Picture 7;** A diagram showing the gradation from paths/rides (central zone of the diagram), to the field layer, then onto the low shrub and sub-shrub growth, then through to the woodland canopy

One problem that has had to be overcome is that many of the soft paths lay wet for long periods of the winter. This has been partly overcome by placing layers of wood chip over some of these. As the level of these paths has risen they have become drier under foot. It is essential that this element continues to be managed.

Management of rides must also include cutting of trees and vegetation along either side of the paths to create broad open scallops, which will allow more forward and side views, thus preventing the path



user feeling uncomfortably hemmed in. It will also enable more ground flora to develop, to be seen from the paths, and will provide sunlit places for butterflies and other insects which will add to the attractiveness of the experience.

**Picture 8;** Without proper management of the woodland rides, they can degenerate into a muddy mess which encourages woodland users to find alternative routes, at the detriment of the surrounding vegetation.

### 3.12 Soils and pollution

Industrial emissions to air, and nitrogen dioxide pollutants from combustion sources, including vehicle emissions, are substantially increasing nitrogen deposition and concentrations in soil and water. A UN report explains that *“The availability of nutrients is one of the most important abiotic factors that determine plant species composition in ecosystems. Nitrogen is the limiting nutrient for plant growth in many natural and semi-natural ecosystems. Most of the plant species from oligotrophic and mesotrophic habitats are adapted to nutrient-poor conditions, and can only survive or compete successfully on soils with low nitrogen availability. High nitrogen deposition causes changes in vegetation composition and vegetation structure.”* (UNECE 2003). Although these effects are most pronounced in uplands and grasslands any effect on woodlands also need to be considered as many ancient woodland plants depend on lack of nitrogen enrichment.

A more localised source of pollution is from dog faeces. Nitrogen phosphates and potassium from dog faeces can have a significant fertilising effect particularly along edges of paths and rides where many woodland plants are located.

### 3.13 Soil moisture levels

As part of MKDC’s development and reclamation works of Howe Park Wood in 1975 the drains (ditches) were cut to make main paths drier and to remove surface water from three of the four compartments. CRC’s 1984 ‘Management Plan’ report indicated that the wider effects on the Wood’s ecology would be limited because of the slow lateral drainage of clay soils, though they did not provide objective evidence to substantiate this opinion. Recommendations from that report included

that the drainage of the woodland should not be altered as many of the more interesting species found in the woodland are associated with the wet ground conditions normally present.

That said the hydrology of Howe Park Wood was probably partly changed by the construction of ditches either side of the main rides. It is not clear whether this changed the wetness of the Wood substantially, but it may be drying some areas of the wood in the summer. This may be exacerbated by recent changes to rainfall, also if predictions of hotter drier summers as a consequence of climate change are borne out. This kind of woodland has its own distinct mix of flora, so proper awareness of the requirements of these species will enable the beneficial biodiversity to be maintained.

The 1995 'Vegetation Survey' report includes a plan showing damp and wet areas in the Wood, but this was based on a subjective assessment not measurements. It concluded that "With the very limited and local distribution of Dog's Mercury *Mercurialis perennis* and contrasting widespread presence of *Ranunculus ficaria* [Lesser Celandine], *Carex* [Sedge] species and *Populus tremula* [Aspen], the indications are that moisture levels are currently being maintained". It is not certain that this is the current situation as there are subjective reports that areas of the woodland seem to be drier than they used to be. Inevitably, this is the case initially in areas that have been cleared and coppiced recently, but some objective measurement of moisture levels and monitoring over time would enable a clearer understanding of any changes that are occurring, particularly in response to a changing climate. Measurement would enable better management of future moisture levels to sustain the Wood's range of flora.

### 3.14 Ditches and watercourses

The ditches support a wide diversity of flowering plants and provide nesting and overwintering sites for some invertebrates, such as some of the Bumblebees *Bombus spp.* The '1992 'Effects of Coppicing' study said that ditches should be maintained by clearing of only the base and lower slopes, with the material piled on the woodland side of the ditch, rather than clearance of all the vegetation. It also said that consideration should be given to less frequent ditch clearance, and of cutting either one side of a ditch at a time or shorter lengths in a particular year, so that plants and invertebrates that use these locations are enabled to survive and reproduce.

Currently during December to early February of each year, and as part of a two year programme of rotational cutting regimes. The organic arisings are thinly spread on the cut area on the woodland side of the ditch. Plan 7 shows current term contract treatments (2010 -1215).

### 3.15 Ponds

CRC's 1984 'Management Plan' report included that "attention to the management of ponds, streams and rides is needed to encourage a richer flora and consequently add to the natural diversity of the woodland habitat". Most of the Wood's ponds are in relatively good condition due to the management work (debris removal etc.) undertaken from the 1980's onwards. Other ponds in the vicinity have not fared so well and are over shaded, full of debris or have silted up (e.g. the pond found in the north east end of compartment 2a). Work will continue as appropriate to each pond and should include vegetation cutting on the pond side, thus keeping the ponds open.

The pond located in Compartment 3C of the wood has suffered in recent years from regular dog activity. This pond is an important breeding site for Great Crested and Smooth Newts and Common Frogs and also holds nesting Moorhens. As the only open pond in the wood it is also significant for dragonflies with species like Brown Hawker *Aeshna grandis* and Southern Hawker *A. cyanea* present. However, the condition of the pond has deteriorated with increasing turbidity and much reduced marginal vegetation on its southern bank, both unfortunately caused by dogs.

All ponds *and their wider surroundings* should be managed with amphibians (e.g. Newts and toads) in mind and should not be allowed to become over-vegetated or over-shaded. It is equally important that the ditches and watercourses flowing to and from these ponds do not become blocked, to avoid the ponds drying out, particularly in the breeding season (March-June). The ponds should be monitored often enough to ensure their continued suitability for this species.

### 3.16 Meadow and grass management

Floristically rich areas of long grass that are sheltered but with access to direct sunlight provide habitat for a wide range of species and species groups. Accordingly it is intended to continue with the current approach to grassland maintenance and to seek opportunities to extend and enrich areas of long grass in and around the woodland (*Plans 3 & 7*).



The grassland and grassy/shrubby areas found adjacent to the rides and the woodland edge should generally be managed as long grass, with larger areas being encouraged to become wild flower meadows. These areas should be cut once a year or less and arisings removed from site.

**Picture 9;** *A meadow found on the north-west side of the wood that was created in the late 1980's and since then with the help of careful management has developed nicely.*

The largest of the open grass areas (approximately 6,000M<sup>2</sup>) is to the north-west of the woodland (*picture 10.*), near the Study centre and the H7 Chaffron Way. This area has been developed as a wild flower area since the mid-1990s and is managed by annual hay-cropping of half the area, while other sections of it are cut every 3 years, primarily to offer continuity of habitat for amphibian species such as Smooth and Great Crested Newts.

### 3.17 Integration of surrounding landscape and wildlife corridors

The Management plan incorporates sections of younger landscape that is found along the woodland edge (*Plan 3*). Although not part of the semi-natural ancient woodland, it is important to include these areas, as they will have such an influence in connecting the woodland with the wider landscape and it is important that these sections are managed along the same lines as the woodland itself. These areas are found predominately on the woodland's north, north east and sections of its southern side and totals 8.5 hectares. This land is a combination of developing plantation and meadow grasslands (long and short) and even elements of shrub planting. As seen in *plan 9*, these areas are part of a wider linear landscape that needs to be linked with the Wood through continuous and consistent management techniques.

The integration of the Wood and the surrounding landscape is vital (*Plan 9*). This will enable spread and movement of species and help to avoid the more sedentary species from becoming genetically isolated. When looking at 'landscape scales' particular important connections include the south west of the wood leading to St. Giles Church, site of the medieval village and associated ponds and semi-improved grassland. This linear strip threads its way down to Kingsmead wood and then Swans Way and the wider countryside. Another important link is the one that goes south east of the wood and follows the V2 grid road to the Tattenhoe Brook. The Brook has its own landscape associated with it and its floodplain (up to 200m wide) that runs again to the city's edge and the landscape beyond and heading towards Furzton Lake the other way. Other links into areas such as Westcroft and Emerson Valley are also important to the wood and its connections into the wider landscapes.

Howe Park Wood has much younger landscapes surrounding it on two and half of its four sides (with housing found along the other sides). This includes plantations (about 25-30 years old) shrub areas and grassland that is a mixture of short and long grass. Management of these sites and correctly integrating them with the semi-natural woodland is vital, if the woodland with its flora and fauna is going to be integrated with the rest of the city's open space. The relatively young plantations adjacent to the Wood should continue to be developed, including thinning as required, while favouring trees species associated with the Wood itself. Enough light should be allowed into plantation floors to allow the development of the understory and ground flora, while monitoring these to form the basis for future wildflower seeding programmes.

Around the year 2000, a proportion of the surrounding grass area was sowed and began to be managed to develop as wildflower meadow. This has included the removal of cut arisings, an action which needs to be continued. We also need to develop the woodland edge and take such actions as leaving uncut areas of grass and other ground vegetation, or at least cut on rotation, to form 'transition' sections that will offer opportunities primarily for invertebrates and small mammals, while offering habitat and feeding for birds.

There is also a need to further develop the woodland's edges and see how this better integrates with the younger landscape. The establishment of longer grass or transition areas needs to be strongly considered to increase the biodiversity strength of the woodland's edge (invertebrates, birds etc.). Ponds on the outside of the woodland need to be continued to be managed in ways that benefit amphibians and invertebrates and again connections to the wider landscapes vis long grass, maturing plantations and un-manicured vegetation is vital.

### 3.18 Productivity

Some woodland products become available as an outcome of management activities in achieving the primary objectives for Howe Park Wood. The produce can be utilised without detriment to the wood's conservation or recreational value, provided care is taken, especially with regard to extraction. Produce should be regarded as a by-product of management for conservation and recreation in much the same way that woodland habitats were a by-product of ancient woods being managed as an economic resource. It is not intended that the production of timber should become a primary objective or that the wood be managed in a way to maximise economic returns. Produce that is and can be sourced from the Wood include:

- Timber for firewood or other markets e.g. larger roundwood (produced in combination with leaving cut wood on the woodland floor for habitat value)
- Hazel stakes or binders for hedge laying purposes
- Gathering of tree or wildflower seed e.g. Bluebell seed.

### 3.19 Non-indigenous ground flora species

Britain is a hot-spot for the indigenous Bluebell *Hyacinthoides non-scripta*, which is present in relatively few other northern European countries. Two other Bluebell species have been introduced to gardens and woodlands in the UK: they have become naturalised and have spread. Even more intrusive is a hybrid of one of these which has been even more widely introduced and even planted in woodlands. All three can hybridise with the one Bluebell species indigenous to Britain, so risk the decline of the native Bluebell. The indigenous species is more delicate, has a drooping shape, and tubular rather than bell-shaped flowers which are deep blue. There is no case for planting any Bluebell in any of the ancient woodlands in Milton Keynes; nor should any be planted near these woodlands. Unfortunately, the hybrid *Hyacinthoides non-scripta* x *H. massartiana* and possibly the Italian Bluebell *Hyacinthoides italica* and the Spanish Bluebell *Hyacinthoides hispanica* are present elsewhere in Milton Keynes and risk causing the spread of hybrids and non-native species into woodlands at the expense of *Hyacinthoides non-scripta*.

Care should be taken not to introduce non-native ground layer plants into these ancient woodlands or near to them, as there are other examples of non-native species similar to AWI plants; for example there is an introduced sub-species of Yellow Archangel *Lamiastrum galeobdolon* which is found in the wild in Milton Keynes: *Lamiastrum galeobdolon* sub-species *argentatum* has whitish blotches or marbling on its leaves.

### 3.20 The Parks Trust's Biodiversity Action Plan

Woodland managers need to be aware and act in accordance with The Parks Trust's Biodiversity Action Plan (BAP) and act upon proposed and desirable projects as laid out in the BAP and set out elsewhere in this management plan, including:

#### *Proposed Activities*

- Continuation of on-going conservation management activities (coppicing, thinning, and ride/glade management).
- Continue to retain standing and fallen deadwood to increase the deadwood resource.
- Maintain records of known bat tree roosts and retain their local environment.
- Continue to maintain and monitor the established bat box scheme.

#### *Desirable Activities*

- Commission professional ecological surveys of woodland vegetation every 10 to 15 years; evaluate against previous surveys to identify change and any long-term trends.
- Locate, record, map and assess the condition of all veteran trees and coppice stools.
- Create refuge habitat/sites for hibernating reptiles and amphibians.

There are several wildlife conservation measures that will continue to be undertaken. These include the installation and maintenance of tawny owl boxes and bat boxes as well as the construction of amphibian hibernacula and grass snake basking and breeding areas.

### 3.21 Birds and Bats

#### *Birds*

Four Breeding Bird Surveys have been carried out over the 33 years from 1974 to 2007 of Howe Park Wood and Shenley and Linford Woods. These provide invaluable evidence of changes in numbers of breeding territories in these woods, and trends for particular species. Some of these reflect declines in numbers of some woodland species that have occurred across Britain, however these declines have often been attributed to factors that are less relevant to managed woodlands in Milton Keynes, such as woodlands elsewhere with closed canopies and declining understoreys, or woods intensively browsed by deer, which are more characteristic of many unmanaged woodlands elsewhere across Britain.

Inevitably, there have been fluctuations in breeding bird territory numbers in Howe Park Wood for each species; some may relate to external factors such as weather. Other changes may relate to

development occurring around the wood, stage of woodland management, increasing disturbance, or extraneous factors affecting summer migrants. A further breeding bird survey will be conducted in 2018 to provide more up to date figures on bird numbers.

In Howe Park Wood the overall picture between 1974 and 2007 has been of a 23% decline of number of breeding bird territories. The overall number of territories remained relatively stable between 1974 (366) and 1987 (362) and between 1993 (286) and 2007 (282). The rapid decline was over the six years between 1987 and 1993 when there was a 21% decline in overall number of breeding bird territories. These overall figures mask even larger declines of particular species over those six years, for example the Willow Warbler (27 territories down to 6); Chaffinch (28 down to 10). These declines preceded development of housing in Tattenhoe which took place in the 2000s. Some species have increased over the 33 years from 1974 to 2007, some have held relatively stable populations, but others have declined or been lost entirely from the wood. This can be summarised as:

- 1) Significant increase in number of territories of:
  - a. Carrion Crow
  - b. Green Woodpecker
  - c. Great Tit
  - d. Long-tailed Tit.
  
- 2) Over time, a relatively stable number of territories of:
  - a. Blackbird
  - b. Blackcap
  - c. Blue Tit
  - d. Great Spotted Woodpecker
  - e. Sparrowhawk
  - f. Tawny Owl
  - g. Treecreeper
  - h. Wren
  - i. Wood Pigeon.
  
- 3) Fluctuation of a relatively small number of territories of:
  - a. Jackdaw
  - b. Jay
  - c. Magpie
  - d. Pheasant.
  
- 4) Significant decline in number of territories of:
  - a. Bullfinch
  - b. Chaffinch
  - c. Dunnock
  - d. Robin
  - e. Song Thrush
  - f. Stock Dove
  - g. Willow Warbler.
  
- 5) Loss of species from the Wood:
  - a. Coal Tit
  - b. Goldcrest
  - c. Greenfinch
  - d. Marsh Tit
  - e. Starling.

Declines in bird species may relate to local factors such as:

- Lack of suitable nesting sites
- Inadequate food sources, such as invertebrates, seeds or berries at specific times of year
- Increased predation
- Increased disturbance.

The most recent breeding bird survey (2007) has shown a marked decline in several woodland species such as Marsh Tit *Poecile palustris* and Willow Tit *P. montana*, which mirror national declines in these species.

It is notable that some of the more successful species in Howe Park Wood, such as Great Tit, nest and feed in the upper canopy and that some species that have declined or have been lost from the Wood nest either on the ground or close to it. For example: the Bullfinch forms a nest in dense woody cover between 1 and 2 metres from the ground; the Marsh Tit forms a moss cup in small diameter holes, usually as low as 3m from the ground; the Coal Tit forms a small cup in a cavity on or near the ground; the Willow Warbler usually nests in a shallow depression on the ground, close to shrubs or tall vegetation. Species such as these may be suffering from either: increased predation, increased disturbance, or insufficient suitable nesting sites.

Predation could be from Corvids, such as Carrion Crow, or from cats or other mammals. Disturbance could be from people, dogs off the leash, or woodland operations at critical periods of the life cycle. The lack of standing deadwood may account for a lack of low nest-hole sites. It is likely that as the Wood was opened up with surfaced and other defined paths, more people entered the Wood than had happened for many decades. As housing has been occupied in adjoining areas, the number of cats and dogs entering the Wood has also increased, and disturbance of species nesting low down has increased considerably. It may also be possible that people straying off the main paths when birds are nesting has deterred some species from nesting here.

Consideration could be given to communicating to dog-owners that their dogs should be kept on the lead within the Wood throughout the nesting periods, broadly February to August. It may also be worth encouraging cat owners to fit a small bell to their pet, which would give some advance warning to birds. Consideration could also be given to passive management of people's movement through the Wood, by use of: log-edges, dead-hedging, live-hedging or ditching; and careful direction of educational visits to areas where least disruption will be caused.

Song Thrush nest relatively close to the ground, up to about 5m, usually in dense shrubby vegetation, often close to the woodland edge. They feed on the ground, mainly on earthworms and other invertebrates and require relatively soft and moist ground to enable them to probe the soil. Other declining species such as the Greenfinch specialise in hedges and woodland edge. Both these species benefit from transitional vegetation from trees to scrub, to tall vegetation, to open grassland, buffering the woodland edge. These habitat features require ongoing management to maintain this structure and to arrest a transition from scrub to woodland.

The Song Thrush may also use woodland rides where these can provide transitional vegetation, similar to woodland edge, along broad sunny rides protected from wind-chill. The straight rides of Howe Park Wood are less able to provide protection than more circuitous rides in other woods. These rides may funnel wind, but they also tend to be too narrow to ensure adequate light penetration to provide warmth which attracts invertebrate activity. This could be ameliorated by creation of some broad widenings of the rides at a few locations, as well as scalloping, with gradation from low grass at path edges to scrub towards the tree stands, providing ground-level and prolonged nectar sources. According to the RSPB/Forestry Commission guidance in 'Woodland Management for Birds: a guide to managing for declining woodland birds in England' (2005) a rule of thumb is that rides should be at least one and a half times wider than the height of surrounding trees, to reduce the effects of shading and achieve adequate warmth. If this is possible in only a few locations it could provide more protected and warmer alcoves that would benefit some bird species and many invertebrates.

A Tawny Owl *Strix aluco* nest box is located in Compartment 3 and has been used in some years (including 2015). A regular Tawny owl nest site has also been located in a tree cavity in the centre of the Wood. The Wood is large enough to accommodate 3-4 nesting pairs of this species, so consideration could be given to provision of additional boxes.

The Spotted Flycatcher *Muscicapa striata* was not recorded in any of the four Common Bird Census surveys of Howe Park Wood, or Shenley or Linford Wood. This species has suffered enormous declines in lowland England since the 1980s and has appeared to be absent as a breeding species in Milton Keynes woodlands. Recent sightings of Spotted Flycatcher in and around Howe Park Wood in 2014 and 2015 indicate that this declining woodland edge species may be breeding (sightings have

been made in spring and late summer). Specially designed nest boxes installed in the Wood and the adjacent orchard will offer improved nesting opportunities for this species.

Some bird species feed primarily on seeds or berries so plants plentiful in these, over prolonged periods of the year, mainly in the ground-layer, shrub-layer and under-storey will assist these birds. Retention of more trees with holes and gaps for hole-nesting species is needed. Many woodland birds feed on caterpillars and adult invertebrates, for which the woodland canopy, other trees, the shrub layer, some scrub, deadwood, leaf litter and upper level of the soil are all important. Continuity of coppice rotation should assist in providing a wide range of age-classes in the Wood to provide for a diversity of invertebrates.

#### Bats

It is essential that all woodland operations in Howe Park Wood take account of the requirements of bats. For example, any tree containing deadwood and woodpecker holes, or other holes or cavities, could potentially hold a bat roost. If such trees need to be felled or reduced, they must first be surveyed by staff trained in accordance with The Trust's 'Code of Practice for Bat Habitats' (February 2012 or later editions) and with the relevant Natural England licence.

Similarly, the locations for bat boxes have been carefully selected to ensure at least 50% canopy cover where they are located, therefore works to thin the canopy in the immediate vicinity of boxes should be minimal.

In 2012 twenty four bat boxes were installed in Howe Park Wood as mitigation for the development of an old cottage into the Passive House, which had offered roosting habitat for bats. These were a mixture of 2FN and 1FF boxes, targeting Noctule bats *Nyctalus noctula*, which are known to forage in Howe Park Wood and other woods nearby. These boxes will be monitored in 2016 and 2017 for occupancy by bats.

In May and June, many bat boxes are used by nesting blue and great tits. Research by North Bucks Bat Group has shown that if companion bird boxes are put up close to bat boxes, tits will tend to use them in preference to the bat boxes. It is therefore advisable to install wooden bird nest boxes on the same trees at the bat boxes.

### 3.22 Managing habitat for butterflies

Howe Park Wood contains about 27 species of butterfly, including less common species such as White Admiral, Purple Hairstreak and Black Hairstreak.

The 2004 butterfly survey report made several important recommendations to improve habitats for butterflies in Howe Park Wood. These are set out more fully in Appendix 3, but in summary were:

1. Wider rides, leaving untidy edges and corners in sunny situations
2. Less frequent cutting of ride-side edges and managing these rotationally in sections, some left for two years
3. More nectar sources within the Wood, for a more prolonged season, including planting of late summer flowering species such as Hemp Agrimony *Eupatorium cannabinum* and Fleabane *Pulicaria dysenterica*
4. Leaving grassy habitats to set seed and leaving a proportion to stand uncut over winter, including grassy tussocks
5. Establishing broad woodland edge zones of low scrub and tussocky grassland, including some wildflower seeding, to achieve a mosaic of different habitats.

The Black Hairstreak *Strymonidia pruni* is present in parts of the Wood in relatively small numbers, so its habitat requires careful management. In order to breed this butterfly requires extensive areas of tall, mature Blackthorn, particularly stands older than 20 years. Its eggs are laid singly in a fork of a Blackthorn twig and remain there for up to nine months. The caterpillar emerges to feed on Blackthorn as the blossom and leaves emerge, and after a couple of months pupates, to emerge as a butterfly for a brief flight period in June/July. Managing blackthorn thickets for structural diversity of age, with some sheltered areas and clearings, should give the best results for the long term survival of this species. But those managing the Blackthorn need to know where any management might affect the eggs, caterpillar, chrysalis and adult butterfly, so specific guidance must be taken from those with expertise in this species.

The Wood White *Leptidea sinapis* has always been a rare species, restricted to some woodlands in southern England and Wales. Typically it is found along sunny, woodland rides and open glades with limited shade (an optimum 20-50% shade) and tall grass or scrub margins where its larval foodplants are present. The Wood White was present in Howe Park Wood but there have been no confirmed sightings since 1995. There are also anecdotal reports of Wood White from Linford Wood around the early 1990s. There is a need to continue to monitor these woods and other areas for their presence or return and to carry out management to sustain suitable habitat with its foodplants.

The Wood White is one of the most rapidly declining butterfly species in the UK. It tends to do best in large woodland complexes with a number of very open, wide rides. Locally it can be found in good numbers in Salcey Forest and Wicken/Leckhampstead Woods, and the species is subject to a Butterfly Conservation regional project focusing on Silverstone Woods. It is not thought likely to recolonize Howe Park Wood or other woodlands in Milton Keynes without major change in management practices, which would favour significantly wider rides and large clearings that offers open, sunny rides with a mix of vegetation at suitable heights for the butterfly to breed and survive. When looking at favourable habitat for the Wood White, the development of the woodland edge in a combination of an increase in long grass and transition area and the maturing road side plantations, will between them help form sections of wide rides e.g. sheltered grassland and fringes between the said features that may encourage the Wood White back to the wood.

In woods where the Wood White survives, these butterflies tend to be concentrated in young coppice where canopy height is 2-5 metres tall, or in wider rides running through slightly older growth. The Wood White can thrive if the ride margin vegetation is cut back relatively infrequently, for example with selected sections cut back every 3-6 years. They cannot tolerate annual edge cutting as this removes all potential breeding habitat. Cutting ride edges in alternate years is also unsuitable as eggs tend to be laid in the taller areas. The Wood White is generally associated with wider grass rides than Howe Park Wood currently provides.

Wood White - larval foodplants,

Regarding larval food plants, these seem to be largely specific Vetches and Trefoils (those with an asterisk were recorded in HPW in the 1995 and earlier surveys).

\* Yellow Meadow Vetchling *Lathyrus pratensis*, \*Tufted Vetch *Vicia cracca*, Bitter-vetch *Lathyrus montanus* (*L. linifolius*), \* Greater Bird's-foot Trefoil *Lotus pedunculatus*, Common Bird's-foot Trefoil *Lotus corniculatus*

Wood White Adult butterfly - are said to feed on the following flowers on their first emergence:

\* Bugle *Ajuga reptans*, \* Ragged-Robin *Lychnis flos-cuculi*, \* Bird's-foot Trefoils *Lotus spp.*; and on the following for their second emergence: Trefoils *Lotus spp.*, \*Knapweeds *Centaurea spp.*

There is potential for another species, the Silver Washed Fritillary *Argynnis paphia* has been recorded in the Wood in recent years (before 2014). This butterfly lays its eggs in the crevices and such features of trees near to Common Dog-violet *Viola riviniana*, on which its caterpillar feeds.

White Admiral *Limentis camilla* is an uncommon woodland specialist which is present in the wood in low numbers. Its sole larval foodplant in Honeysuckle which can be found along many of the rides whereas the adult butterfly can sometimes be seen nectaring at the flowers of brambles. White Admiral also occurs at Shenley and Oakhill Woods and along the North Bucks Way where it has been recorded in transect counts. The North Bucks Way is almost certainly a vital corridor enabling this shade tolerant species to move between woodlands.

Future vegetation surveys need to take special note of the above species so we can better understand the extent that these plants are present and are they in locations that suit the Wood White.

### 3.23 Pests and diseases

There are many pests and diseases that at different levels may have a detrimental effect on the woodland, but the two currently affecting the woodland most are Grey Squirrels *Sciurus carolinensis* and Honey Fungus (various species of *Armillaria*). The serious threat of Ash Dieback *Chalara fraxinea* has been covered elsewhere in this management plan.

Until the early 1990s Grey Squirrels had, over a period of years, caused great damage in the Wood, bark-stripping many of its trees as they reached the pole stage. From the mid-1990s Squirrel numbers have been controlled annually using baited hoppers containing Warfarin. With the reduction in Squirrel numbers the stripping damage has reduced considerably. Control of Grey Squirrels should continue. This may prove problematic if the use of Warfarin for this purpose is banned, as is under consideration by the European Community. Alternative control methods would need to be investigated, including other poisons, 'dray poking' using 'disturbing drays', or licensed shooting and trapping.

Honey Fungus *Armillaria spp.* is present in the Wood. It attacks and kills roots of many woody and perennial plants. Trees can be infected by Honey Fungus, particularly those under stress from other pests and diseases, which can bring about early deterioration or death of individual trees. Its most characteristic symptom is white fungal growth between the bark and wood, usually at ground level and clumps of honey-coloured toadstools sometimes appearing briefly on infected stumps in autumn. Honey Fungus is seen to be part of the Wood's natural environment and there are no plans to try to control it (which would be extremely difficult) other than ensure any infected trees are not a danger to the general public.

In 2015 Ash dieback *Chalara fraxinea* had yet to reach the wider environment in Milton Keynes, although it had been imported to new plantations in Buckinghamshire from which newly-planted trees have since been removed and destroyed. Woodland managers need to be aware of its spread in the UK and its potential effects on woodlands. If the disease were to infect Howe Park Wood in an aggressive way the effect would be devastating as Ash *Fraxinia excelsior* is the most numerous species in the woodland at canopy and understorey level and as a coppiced tree.

Pedunculate Oak *Quercu robur* is under threat from various diseases including acute and chronic decline. 'Oak decline' is a complex disorder or syndrome in which bacteria with other damaging agents, such as insect infestation or weather damage, interact to bring about a serious decline in tree condition. The woodland's managers need to regularly assess disease progress and develop strategies to combat them. In the future this may include limited use of native species of the surrounding area that have not been associated with Howe Park Wood, such as Small-leaved Lime *Tilia cordata* and Alder *Alnus glutinosa*.

Although not widespread in the wood Powdery mildew can be on occasions found in the wood. Powdery mildew of Oak is caused by the fungus *Erysiphe alphitoides* (also known as *Microsphaera alphitoides*) and it is a common foliar pathogen of oak throughout Europe (first found in England in 1908). In the confines of the wood there is not much practically that can be done to tackle it. In mature trees the disease is generally less damaging than in younger trees, but in combination with other factors such as defoliation by insects can contribute to tree decline. Water stress can be a contributing factor to plants suffering from this disease.

Erysiphe attacks young leaves and soft shoots, covering them with a felty-white mycelium, causing them to shrivel and blacken. Mild overcast conditions are optimal for development of the disease, which usually appears in summer when warmer conditions prevail.

### **3.24 Domestic animals along with human interference**

Since houses were built on the woodland edge in the 1990's, the pressure on the natural environment has undoubtedly intensified. Extra footfall has the potential to cause damage to the woodland floor, if people are not generally directed along set paths and if those paths are not properly maintained. Illicit paths and wanderings should also be discouraged. Fly tipping, small scale fires and camping are all issues that can and do have an influence on the wood.



**Picture 10;** Dogs (and cats) exploring the woodland can cause a significant disturbance to the woodlands flora and fauna, especially at breeding and nesting times.

Domestic cats are regularly seen in the wood (a member of staff once reported seeing seven cats in a single one hour visit). Cats can have a detrimental impact on bird breeding populations especially in lower canopy areas. Species such as Marsh Tits, Wren etc. that nest low down, can particularly suffer as a result of predating domestic cats, as can any ground-feeding species. The subject of the effects of domestic cats on breeding bird populations is a sensitive one, so the way to tackle this is to gain a better understanding of what is happening in Howe Park Wood and offer local residents further information about impacts domestic cats can have on woodland wildlife.

Dogs in the wood can also be detrimental to a wood's wildlife, particularly with dogs allowed to run through the wood off the lead, or where continuous barking could be unsettling to woodland mammals and birds.

### **3.25 Ecological monitoring**

We will continue with ecological studies of Howe Park Wood to make comparisons with the previous 22 studies relating to this Wood and to cover species and aspects these did not cover. New studies should be designed to provide advice on the appropriateness of management actions being undertaken and to inform future plans.

There have been no studies of pollinators such as ants, bees, wasps (Hymenoptera), hoverflies or other flies (Diptera), spiders (Arachnida), bryophytes, mosses, lichens or mammals since the 1970s and early 1980s when extensive studies were carried out by Bernard Frewin of the Milton Keynes Natural History Society. Generally, surveys have found that the woodland is ecologically relatively rich and is of significant wildlife conservation value, and reports of these have made specific recommendations for future management. The Diptera (true flies, including hoverflies) and Hymenoptera (bees, wasps & ants) contain important pollinators of ancient woodland plants as well as species specific to veteran trees and deadwood.

The most recent study of the vegetation and ground flora was in 1995 and a review of the effects of management on the woodland flora over this period would enable an objective evaluation of how well the special ancient woodland and other species are doing.

Inevitably, many of the previous ecological studies of Howe Park Wood recommended follow-up studies to evaluate the effects of the gradual restoration of the woods. These recommendations included:

- A follow-up vegetation study to provide comparisons with the previous study, to show the effects of the last two decades of woodland management.
- A study of pollinators and associated insects: bees, wasps, hoverflies, and ants.
- Butterfly and moth studies to make comparisons with the 1999 and 2003 reports and previous studies.
- A Common Bird Census study to show changes since the 1987, 1993 and 2007 studies.

### 3.26 Visual character

To promote the essential landscape and visual character of semi-natural ancient woodland requires much the same set of actions and techniques as those described above to meet Objective 1, relating to the Wood's ecology and biodiversity. In addition to these, further thought will need to be given to how visitors to the Wood will be able to enjoy its visual and historic features. There is also a need to continue to develop the surrounding landscape, to ensure it is sympathetic in style and feel to the woodland and that the wood is well connected to it.

It is necessary to continue working towards balanced age classes of trees and shrubs, to provide variety of visual types. This will be done through management technique such as coppicing, developing mixed age classes and promoting ride-side clearings, and will include work on the woodland edge and surroundings, while protecting historic features such as the wood-banks.

The landscape value from the perspective of someone walking in the wood is more involved and requires the woodland management systems to be applied in ways that are sympathetic and appropriate manner to its daily use. Vegetation management needs to provide:

- A good length of view into the woodland from the path or ride network and a good forward length of view along paths but avoiding views out of the woodland to developed areas.
- Views towards, and framing, trees of unusual form or substantial trees remarkable for their size and obvious age.
- Providing good visual access to wildflower areas, especially in spring to flowers such as Primrose, Violets, Wood Anemone, Lesser Celandine and Bluebell.

**Objective 3. Access and recreation:** The woodland and its environs are to function as a distinctive part of the overall park provision in the western flank of Milton Keynes and to provide public access via paths which exploit a variety of woodland settings and which link to recreational through routes and the wider countryside. It should be well-connected to entry points such as car parks and public transport stops. The woodland should offer an accessible, stimulating and varied environment for people's relaxation and enjoyment.

**Objective 4. Education:** To enable Howe Park Wood to be used as an educational resource and provide information to assist this. Whilst the priority will be encouraging knowledge and understanding of Howe Park Wood and its surrounding environment, the education and visitor centre will be a valuable educational resource that can be used by people across the city and surrounding area. The centre will facilitate wider understanding of the biodiversity, history and amenity of other valued sites in the city as well as a broader understanding of the green estate and the work of The Parks Trust.

### 3.27 Public access and types of use

The Wood is well-used by walkers. Pedestrian access into and through the wood is provided by a network of surfaced, woodchip and grass paths that run through and around the wood, including access to car parks. The study and visitor centre is situated in its precise location to encourage use of all aspects of the Wood.



**Picture 11;** *A wood chip ride with flowering Wood Anemone along its sides*

There have not been any recent surveys of user or visitor numbers specific to Howe Park Wood (at July 2015) though there have been some citywide surveys that are relevant. A 2012 survey of public use of parklands across the city (Parks Trust and Glow-worm Marketing) revealed that of the 603 responding to the question 'Which park do you visit most?' 3% of the responders cited Howe Park Wood as the site they visit most frequently. Linford Wood had a return of 6% and Shenley Wood had a return of 3% of people saying those woods were the park they visited most. More work needs to be undertaken on visitor numbers and use relating to Howe Park Wood.

As we encourage more people into the woodland it is essential that access is managed effectively. Inappropriate use of the Wood could have a damaging effect on its conservation value and public enjoyment, especially by trampling of the valuable and sensitive field layer. The path network largely serves to avoid this type of damage by ways in which it guides people through and around the woodland. Although the overall woodland area is generally referred to as public open space, use is channelled rather than entirely open. Any further extension of access would have to be done in ways that minimise impacts on the wildlife and ecology of the wood.

Management of Howe Park Wood will ensure the wood is fit for public access. This includes:

- Paths (hard and soft surfaces) and benches are appropriately maintained.
- Trees in the vicinity of paths are maintained in a safe condition.
- The Wood is regularly visited and patrolled by Parks Trust staff and volunteers.
- Anti-social issues are tackled (e.g. illegal camping, vandalism).
- Litter is effectively managed.

Individual trees found along paths, rides and other areas of public access shall be managed in accordance with general principles of woodland management, along with the health and safety considerations of users. Under the terms of The Parks Trust's Tree Inspection Policy (July 2013) these trees will be monitored and formal inspections recorded, as they are undertaken (normally every three years in such woodland situations) while ensuring any consequential work is recorded.

### 3.28 Signage and interpretation

As part of the Trust's revised signage and interpretation strategy (2008) high quality signs were installed in 2013 and 2014. These included: 'badging' signs, notice boards, posts with route markers and site interpretation boards. There is a need to ensure signage is well maintained and remains appropriate to the woodland users.



**Picture 12;** A general information Notice Board, in situ at the south entrance to the wood.

### 3.29 Education and Training

It is intended that Howe Park Wood, the visitor and study centre and the surrounding area should be available as an educational resource for informal use and that there should be a repository of information that can be used for the purposes of education and through signage and online. The form of educational use will be generally passive (school groups, guided nature walks, general walks, volunteer working groups, etc.). Areas in the wood suitable for educational activities include the grassy rides and glades, and paths with chipped surfaces.

Howe Park Wood, along with its visitor and education centre, offer good learning opportunities for members of the public, school children and visiting groups, who will have the opportunity to learn about the natural world, the woodland environment and the intricacies of semi-natural ancient woodlands. Such practical experience will be supported by Parks Trust staff attending seminars or training days covering topics associated with the woodland. This will include courses about wildlife and birds encountered in woodland environments and formal or informal training for staff and volunteers to improve knowledge of ancient woodland plants and biodiversity. Other aspects of education will include:

- Interpretation, using a variety of media describing and explaining aspects of the immediate and local environment, including its social and natural history. Emphasis will be placed on the SSSI status of the wood.
- A programme of events including guided walks, talks, practical exploration and traditional crafts to encourage the use and understanding of the wood will be run throughout the year.
- Environmental and ecological information from the many ecological studies will be made available.
- Volunteer groups helping with restocking of the wood through natural regeneration or the use of traditional management techniques, such as layering of Hazel, or developing a population of young Oak *Quercus robur* for the wood, by gathering acorns from selected trees in the wood, to

propagate, grow on and then plant back in appropriate locations, subject to Natural England SSSI approval and under the guidance of landscape staff.

- A programme of curriculum enhancement education activities for all school Key Stages will be provided, as well as programmes of community and adult education to further understanding of the natural environment.
- Encouraging people to just visit the visitor and study centre (e.g. via a cafe facility or organised birthday parties), which in turn will help introduce people to the wood and its environment.



**Picture 13;** *New housing constructed in the 1990's and 2000's in the close proximity of the wood has meant a massive increase in visitors to the wood. This will inevitably add pressures to the wood. Increasing peoples understanding of the wood and its dynamics will help the wood move forward positively.*

## Section 4: Work Programme - Autumn 2015 to Autumn 2020

A fundamental requirement of any works or operations undertaken should be that actions fulfil as many of the objectives as possible and do not necessarily focus on achieving individual aspects of the objectives in isolation. To achieve the overall aim and objectives of this management plan the analysis and prescriptions discussed in previous sections of this report above are to be applied in the following ways.

### 4.1 Site management and supervision

Directing and specifying works, and implementation of the plan will be primarily carried out by the Trust's Operations Team that will include: Director of Landscape and Operations, Area Landscape Manager, Arboriculture and Biodiversity Officers, along with the Community Rangers. The Operations team's work will be supported by the Trust's Education (e.g. overseeing use of the Visitor and Study Centre), Communications, Event and Community teams and will be assisted by volunteers and the use of consultants as required.

The expertise of staff will be developed with the provision of any required or appropriate training, while developing their experience of woodland management and all it encompasses.

The Trust's Chief Executive and Trustees will oversee the strategic implementation of the Management Plan to ensure that aims and objectives are being achieved.

### 4.2 Organisation of works

All works within the plan area will be carried out in accordance with The Trust's 'Operational Practices and Procedures' document (under revision in 2016).

- Routine works

Works and short term cyclic work such as mowing, hay cropping, litter collection, pruning adjacent to footpaths etc. will mostly be undertaken as part of large performance-based term contracts.

- Long cycle and non-routine works

This category of work includes items such as coppicing and canopy thinning work, which is undertaken on an approximate 15 year cycle, as well as footpath resurfacing, pond maintenance or re-profiling. These will be specified and competitively tendered (where and when appropriate) and carried out by skilled contractors or directly employed staff.

### 4.3 Working around the woodland's flora and fauna

Generally, tree, shrub and compartment work will take in place in November and December when impact on the woodland environment is at its lowest. Working at this time of year gives consideration towards the woods' fauna and ground flora by:

- Minimising ground compaction (before the water table or surface area gets saturated from the winter's rain)
- Ensuring emerging bulbs do not get trampled
- Undertaking general works at this time of year will not conflict with bird nesting (see Parks Trusts document 'Bird Nesting – Working Code of Practice')
- Minimising disturbance to amphibians associated with the ponds /watercourses and associated wetlands (e.g. Great Crested Newts)
- Because of the potential disturbance to bat roosts occurring in the wood, individual trees (usually those in the upper canopy that are beyond 'pole stage') will be appropriately inspected by qualified staff before work takes place.

#### **4.4 Compartment work**

Compartment work includes general coppicing and thinning works associated with the Wood's 15 main compartments. Thinning and selective removals in the individual compartments will be carried out on a targeted 15 year cycle. Generally this work will take place from October to December when impact on the woodland environment is at its lowest (minimising ground compaction and conflict with bird nesting, newts and other amphibians, while ensuring emerging bulbs do not get disrupted). All work will take into consideration potential disturbance to bat roosts. Inspections of individual trees should be carried out, especially of trees that are above 'pole stage' size.

As each compartment is worked, previously planted species which are inappropriate (e.g. species introduced to the wood by planting) will be removed; this should be completed by 2020. As a general rule all trees and vascular plants not native to the wood should be removed from the woods.

##### **4.4.1 Year 1 Nov/Dec 2015**

Complete rideside work throughout the wood retaining sections of Blackthorn (e.g. those found along the edge of compartments 3b and 3c), while ensuring the associated woody vegetation is not encroaching over important ground cover areas. In many areas Hazel and other shrub species have crept into areas that would be better suited from habitat and creating sight lines for the public if they were scalloped and coppiced/cut on a regular basis. To help create suitable habitat for species such as Wood White butterfly ride-side clearance on the south side of s/c 1d will be cut wider than most other ride-side works.

##### **4.4.2 Year 2: Nov/Dec 2016. Sub-compartment 4c (FC s/c 30)**

In Compartment 4c, the understorey (generally consisting of Hazel, Blackthorn, Hawthorn, Re-gen Ash and Bramble ) is very weak due to over shading.

The upper canopy (consisting of Ash, Aspen, Oak, Field Maple and Hornbeam) will be thinned to a maximum intensity of 30% excluding sections where there is Hornbeam. Elements of standing dead wood will be left or created (i.e. via ring barking), while trees with good habitat opportunities (e.g. holes in the stem) will be left as appropriate. Approximately 50% of cut wood will be left to rot as lying dead wood.

The mid-canopy will be thinned to a maximum intensity of 50%, favouring trees of good form for retention(including Aspen and Sallow) in a diversity of species.

The understorey will be coppiced in sections creating small coups, while not exceeding 50% of the compartmental area (excluding ride-side work). Non-intervention belts (dictated by thicker scrub and woodland edge areas) will be left, as will selected tree species to grow on and form the next canopy layer.

##### **4.4.3 Year 2: Nov/Dec 2016. Sub-compartment 3d**

Along the south east side of the compartment there is a prominent section of Blackthorn that collapsed and was subsequently coppiced in and around 2009. This Blackthorn has been historically important habitat for Black Hairstreak Butterflies. To ensure the Blackthorn can continue to grow, competing shrubs such as Hazel and Ash tree re-gen need to be re-coppiced targeting shrubs found within 4 metres of the block of Blackthorn.

To help the said Blackthorn gain more light coppicing of sections of the bordering woodland edge hedge will also need to be coppiced targeting such species as Hazel and Common Dogwood.

##### **4.4.4 Year 3: Nov/Dec 2017. West section of Sub-compartment 1d and south western half of Sub-compartment 1c**

In both these sub-compartments the upper canopy is generally made up of Ash, Oak, Hornbeam and Aspen, while understorey is predominately Hazel, Hawthorn, Hornbeam, Ash re-gen, Field Maple, Bramble etc. The understorey is quite dense, while getting leggy. The ground flora is now being lost due to the density of the middle canopy.

The upper canopy will be thinned to a maximum intensity of 10%. Elements of standing deadwood will be left or created (i.e. via ring barking), while trees with good habitat opportunities (e.g. holes in the stem) will also be left as appropriate. Approximately 50% of cut wood will be left to rot as lying dead wood.

The dense middle canopy will be thinned to a maximum intensity of 50%, favouring Oak, Aspen and Field Maple for retention in a diversity of species.

The understorey will be coppiced in sections creating small coups, while not exceeding 50% of the compartmental area (excluding ride-side work). Non-intervention belts (dictated by thicker scrub) and woodland edge areas will be left, as will selected tree species to grow on and form the next canopy layer.

#### **4.4.5 Year 3: Nov/Dec 2017. Sub-compartment 3c**

This compartment has a good balance of trees and shrubs in the upper, middle and lower canopy sections. However there are some potential for creating standing deadwood in the upper canopy. The central sections of the compartment contain some tall leggy Ash that have no real long term value as meaningful upper canopy trees.

In the middle canopy there are areas of developing Aspen. These Aspen will need thinning out by approximately 50%, to allow the better formed and healthier Aspen to continue to grow and develop, while ensuring there is room in the upper canopy for them to move into.

#### **4.4.6 Year 4: Nov/Dec 2018. Sub-compartment 2a**

In Compartment 2a, the understorey (mainly consisting of Hazel and Hawthorn) is being lost due to over shading.

The upper canopy (species consist primarily of Ash and Oak) will be thinned to a maximum intensity of 20% excluding sections where there is Hornbeam. Elements of standing dead wood will be left or created (i.e. via ring barking), while trees with good habitat opportunities (e.g. holes in the stem) will be left as appropriate. Approximately 50% of cut wood will be left to rot as lying dead wood.

The mid-canopy that consists of Hawthorn, Field Maple and Ash re-gen will be thinned to a maximum intensity of 50%, favouring trees of good form for retention in a diversity of species including Aspen and Sallow

The understorey will be coppiced in sections creating small coups, while not exceeding 50% of the compartmental area (excluding ride-side work). Non-intervention belts (dictated by thicker scrub) and woodland edge areas will be left, as will selected tree species to grow on and form the next canopy layer.

#### **4.4.7 Year 5: Nov/Dec 2019. Sub-compartment 2b**

In Compartment 2c, the understorey (mainly consisting of Hazel and Hawthorn) is being lost due to over shading.

The upper canopy species mainly consisting of Ash and Oak will be thinned to a maximum intensity of 20% excluding sections where there is Hornbeam. Elements of standing dead wood will be left or created (i.e. via ring barking), while trees with good habitat opportunities (e.g. holes in the stem) will be left as appropriate. Approximately 50% of cut wood will be left to rot as lying dead wood.

The mid-canopy that consists of Sallow, Hawthorn, Field Maple and Ash re-gen will be thinned to a maximum intensity of 50%, favouring trees of good form for retention in a diversity of species including Aspen and Sallow

The understorey will be coppiced in sections creating small coups, while not exceeding 50% of the compartmental area (excluding ride-side work). Non-intervention belts (dictated by thicker scrub) and woodland edge areas will be left, as will selected tree species to grow on and form the next canopy layer.

#### 4.5 Declining, dead and dying trees and the management of dead wood

To improve the Wood's biodiversity and effectively apply the Trust's Biodiversity Action Plan (BAP) and its Habitat Action Plan, HAP 01, and as stated in each compartmental working action - larger-diameter dead and dying trees including standing deadwood (which could be artificially created) or those with crown die-back shall, where possible and appropriate to the location will be left in situ (areas with limited public access, thus ensuring the environment is relatively safe for public use).

Up to 50% of felled timber from the upper canopy should be left as lying deadwood habitat, with only some being cut to lengths.

The amount to be left in each compartment should relate to the extent to which it is deficient in deadwood resource (see 4.4). Where logs are cut, they can be placed as log-piles.



**Picture 14;** *Deadwood including sections of large diameter trunks, will be left on the woodland floor and allowed to decay naturally. The tree on the right was left as standing dead wood and eventually fell over; its location was away from any footpath.*

#### 4.6 Management of individual trees and public access

Individual trees found alongside paths, rides and other areas of public access shall be the subject of formal and recorded inspections under the terms of The Parks Trust's Tree Inspection Policy (July 2013 or later editions). These inspections will take place every three years. An inspection of Howe Park Wood is being completed in 2014, with the next one due in 2017. All consequential required work will be undertaken and recorded.

#### 4.7 Re-stocking of the Wood

In the period 2014 - 19 re-stocking of the Wood shall take place in appropriate places through the encouragement of natural regeneration or the use of layering (e.g. of Hazel).

With the seemingly inevitable arrival of Ash Dieback, there is a need to continue to develop a population of young Oak and other tree species (Aspen and Hornbeam) in the wood. The intention is to gather acorns from selected Oak trees in the wood, then propagate and grow them on and then plant them back in the wood in appropriate locations. This will be completed over the five years (depending years where acorns are found in good numbers). This process could involve the activities of the education and visitor centre, local schools and volunteers. We will also monitor the re-generation of Field Maple and Hornbeam over the five year period and review how we can help replenish the stock of these species.

#### 4.8 Maintenance of paths and rides

All paths and rides will continue to be maintained to enable pedestrian access through the wood; re-surfacing of leisure routes will be carried out as required. Woodchip paths, bridleways and green paths will be topped up with woodchips as required, to ensure they remain good and viable paths. All woodchip and hoggin surfaced horse trails shall be maintained as an intermediate grass specification (max height obtained 200mm), to a width of approx. 2.5m, for the duration of the contract.

Grass rides will be monitored for wetness.. Woodchip should preferably not be imported from other parts of Milton Keynes, and should ideally be sourced from within these woodlands.

A rolling five year programme of cutting back and coppicing vegetation and scrub found along paths, rides and woodland edges shall be undertaken (to a depth of up to 15 metres in places) in order to create a graduated transition from the field layer through to scrubby regeneration and then on to the woodland canopy. This work will be undertaken to achieve two primary objectives:

- a) Allow the development of a greater diversity of habitats, vascular plants and invertebrate species along the ride-side
- b) Enable the public using the rides to do so with confidence, while not feeling the vegetation is overbearing or blocking views, as well as enjoying the sight of flowers, butterflies and other wildlife.

#### 4.9 Herb layer management

All herbaceous growth overhanging the leisure routes, horse riding trails, grass and woodchip paths throughout the wood shall be managed in accordance with the principles shown on the stylised diagram inset to the term contract specifications (*TC390; Howe Park Wood and Sheet 16*, section titled '*Herb Layer Management*') and will be cut during mid to late July of each year. The operation shall be carried out using hand tools such as reap hooks, with the objective of cutting back the vegetation overhanging the footpath.

#### 4.10 Formalised grass-cutting (measured)

Continue to manage and maintain the woodland and surrounding landscapes and the associated areas of long grass using various 'long grass' treatments, following specifications found in the Parks Trust's Landscape Maintenance (LM2015) document and '*Western Parks Contract TC390, Howe Park Wood and Sheet 16*, ' (see *Plan 7*'), and *V2 LM contract drawings pages 25 & 24*. Short grass areas which are predominately found in areas surrounding the wood, such as in the close proximity of the study centre will again be managed within the terms of the LM contract.

The long grass and wildflower areas shall generally be cut in the later part of the season and as described in The Parks Trust document '*Landscape Maintenance by Term Contract Section 3*', edition (*LM 2015 and onwards*: As appropriate, the arisings will be gathered and removed from site with the objective to improve the sward quality in terms of wildflower content by preventing nutrient enrichment from arising's rotting down in situ. Such an area is the hay meadow (0.4 hectare) found between the H7, Chaffron way and the wood itself.

#### 4.11 Grass-cutting (unmeasured)

The grass, herbaceous material and natural woody regrowth that is adjacent to leisure routes and woodchip paths, where there is no 'measured' grass cutting regime specified on the contract drawings ('*Western Parks contract TC390 and onwards*'), shall be managed in the following manner:

- a) **Woodchip paths:** In circumstances where grass and other material has colonised and is growing through the woodchip paths the vegetation shall be cut to an intermediate grass specification (max height obtained 200mm) maintaining a width of 1.5 - 2.0 metres.
- b) **Ditch present:** In circumstances where there is a ditch immediately adjacent, the Contractor shall cut the grass, herbaceous material and natural woody vegetation on both sides of the leisure route, grass and woodchip path as long grass, to the edge of the ditch. The said grass

is to be cut in October and the arisings raked up and disposed of by thinly scattering them into the wood beyond the area of cutting.

- c) **No ditch present:** In circumstances where no ditch is present the Contractor shall cut the grass, herbaceous material and natural woody regrowth as long grass on both sides of the leisure route, grass and woodchip path to a distance of 1.5m and 5.0m from the path, forming a wavy or scalloped edge with occasional deep indentations into the wood and away from the leisure route, grass or woodchip path. The said grass is to be cut in October and the arisings raked up and disposed of by thinly scattering them into the wood beyond the area of cutting.
- d) **Green ride fringe management:** During the period from December to early February each year, all grass, herbaceous matter and natural woody regeneration found adjacent to the green rides shall be cut to a height of 100 - 150mm. The area of cutting shall be along both edges of the rides. The cut area shall vary between 2.0m and 5.0m, forming a wavy or scalloped edged on the woodland side (fringe) of the green ride.

#### 4.12 Ditch and watercourse maintenance

Ditches will be maintained as part of a two year rolling rotation, during the period December to early February of each year. The lengths of ditch or watercourse as indicated in the contract Drawings (Plan 7.) ('Western Parks contract TC 390', section 'Howe Park Wood and sheet 16') shall be managed in the manner specified below:

- a) All grass, herbaceous matter and natural woody regeneration shall be cut to a height of 100-150mm. The area of cutting shall be along both edges of the ditch and across the surface of the ditch itself. The cut area shall vary between 2.0m and 5.0m, forming a wavy or scalloped edge on the woodland side of the ditch. All the arisings from the works shall be roughly raked off and thinly scattered into the wood beyond the area of cutting.
- b) The ditch shall then be 'bottomed' to allow the free passage of water. This shall entail the removal of fallen leaves and other accumulated debris. The arisings shall be thinly spread on the cut area on the woodland side of the ditch with the exception of any lumps of wood, old stakes, litter or any other inorganic material which shall be gathered up and taken off site to tip.

The above treatments will be reviewed as the current 'LM' Term Contract terminates in November 2020.

Further investigation of the hydrology of the wood needs to be carried out and perhaps with the use of clay dams, try to hold water back in the path/ride associated ditches that were created in the 1970's, which could be having an influence in the wood becoming a more drier environment that it traditionally has been.

#### 4.13 Ponds

For pond management, as appropriate (e.g. habitat sensitivity or location) a combination of vegetation-cutting on the pond sides or protection to pond sides by encouraging vegetation or fencing shall be used. Removal of excessive vegetation found within the pond and re-excavating of ponds; works shall be carried out as required with the overall objective of keeping the ponds open to light and available as good habitat.

In addition to the above general work, the following works will be undertaken at individual ponds:

- a) The pond located in Compartment 3C of the wood has suffered in recent years from regular dog activity. To reduce disturbance to this pond it may be necessary to construct a low barrier around it using natural materials such as hazel and also to install signage asking dog walkers not to allow their pets in the water.
- a) Open up the pond in compartment 2a by removing proportions of the surrounding vegetation and then assess if the pond needs any excavation undertaking, where it has lost its depth to build up of organic matters.
- b) The two ponds located to the north-west of the wood and close to the Study Centre have been subject to fish removal in order to increase breeding habitat for Great Crested Newts.

Surveys conducted in spring 2015 indicate that the smaller of these two ponds has already been recolonized by newts. These ponds should be monitored annually for newt activity and if fish other than Stickleback are found to be present consideration should be given to their removal. These two ponds hold a large population of spawning Common Toads.

- c) The pond located in the wildflower meadow north east of the wood currently holds the highest numbers of Great Crested Newts. Due to its open aspect and shallow profile this pond too suffers from disturbance from dogs. Signage indicating its importance for wildlife and asking dog walkers to keep their pets out of the water may be appropriate here.

#### 4.14 Control of pests and diseases

Control of Grey Squirrels should continue (via our specialist contractors) using best and most effective and humane control measure available, which is currently control by Warfarin.

The spread of Ash dieback *Chalara fraxinea* across the UK is a real concern (see 3.23). Although there is no plan to remove our established woodland Ash trees (which account for approx. 50% of the upper canopy) we need to encourage other species appropriate to this type of semi-natural ancient woodland by favouring other tree species – apart from Ash – that are native (e.g. Pedunculate Oak, Hornbeam Field Maple, Aspen, Goat Willow or Grey Willow) to the woodland for retention when undertaking thinning or felling operations.

#### 4.15 Surrounding landscape as identified in the management plan

Continue to develop the younger surrounding landscape associated with the woodland to include the following measures;

- On selected sections of the woodland edge leave extended uncut areas of grass/ground vegetation (or cut on rotation) that will form 'transition' sections that will offer habitat opportunities primarily for invertebrates and small mammals alike, while offering habitat and feeding opportunities of birds. The north west and north east sides of the wood land offer the best opportunities for such actions.



**Picture 15;** Woodland edges offer opportunities to improve and increase habitat. In this case in the way of more long grass and improved flora.

- Surrounding plantations should be thinned as required favouring trees species associated with Howe Park Wood. Enough light should be allowed in to the plantation floors to allow the development of the understories and ground flora.
- Sections of surrounding grass areas should be continued to be managed to allow it develop as wild flower meadow (e.g. removal of cut arising's).
- Ponds found on the outsides of the woodland itself need to be managed in a way that allows the amphibians and invertebrate's habitat to develop (e.g. keep free of litter, ensure they do not become over shaded, while ensuring they have a balanced ecology).
- As seen in *plan 9* and identified in the management plan, ensure the area immediately around the wood is connected to the bigger linear landscape through continued and consistent management techniques (e.g. plantation and grass land management), that allow the surrounding green spaces to link up with the woodland.
- Monitor how the surrounding landscape is developing and synchronising with the woodland.
- Extend the above treatments as best as possible into the landscape found beyond the management plan boundaries.

#### 4.16 Development works (2015 -2020)

It is intended that the following development works will be undertaken as part of the 2015 - 2020 five-year plan:

- a) Encourage Blackthorn to re-generate by ensuring in worked areas it is not getting over shaded by other species and as appropriate coppice competing species.
- b) To enable more Blackthorn to reach maturity, make efforts not include Blackthorn or whole areas of Blackthorn in coppicing works e.g. do not coppice whole sections of immature Blackthorn during ride side or general coppicing works.
- c) Further investigation of the hydrology of the wood and with the possible use of clay dams, influence and assess the effectiveness of the path/ride associated ditches.
- d) Consider changing or decreasing the frequency of ditch cutting by evaluating the need to cut the ditches every 2 years.
- e) Continue to assess how connecting landscape/greenspace can be connected to the wood itself
- f) In the five year period re-stocking of the Wood shall take place in appropriate locations through the encouragement of natural regeneration or; the use of layering (e.g. Hazel) and encouraging a population of young Oak in the wood using acorns gathered from Oak trees found in the wood. The re-generation of Field Maple and other species will also need to be monitored over this period.
- g) Look to increase the width of the coppicing and rotational vegetation cutting along the main west to east ride, where it adjoins compartment 1d.
- h) Continue to monitor the Ponds and improve the biodiversity of the ponds by carrying out general maintenance of them e.g. do not allow them to be shaded out, minor cleaning and re-profiling work, removal of litter etc.
- i) Service and top up the wood chip rides with woodchip to ensure the paths remain walkable and so that people are not walking in the wood land to avoid constant wet spots. Also look to improve drainage of such areas at specific and localised sections that constantly remain wet (e.g. cross-path section where all sections of 1b and 1d meet).

- j) Further understand how the wood is being used and the amount of footfall being experienced in the woodland.
- k) Integrate and utilise the dynamics of the wood with the need and use of Howe Park Wood visitor and study centre.
- l) Continue to monitor and beware of how people and domesticated animals (e.g. cats and dogs) affect the wood and its wildlife.

#### **4.17 Specific wildlife conservation measures**

Several wildlife conservation measures will continue to be undertaken. These include the installation and maintenance of tawny owl boxes and bat boxes as well as the construction of amphibian hibernacula and grass snake basking and breeding areas.

#### **4.18 Bench, seat and sign maintenance**

Vegetation adjacent to all benches and seats shall be cut as necessary using hand tools such as reap hooks to maintain free and comfortable access to the facilities and to prevent vegetation growing over and through the installations. The benches will be appropriately maintained, which will include cleaning, painting and replacement of failing or damaged timber. Over the five-year period (2015 - 2020) and beyond we will ensure signage is well maintained and remains appropriate to the woodland users.

#### **4.19 Education and events**

The Parks Trust education and visitor centre is based on the outskirts of the wood and will be a focus for our educational work. Groups using the centre and the wood on a regular basis will include our Youth Rangers (11-18 years old) who meet once a month, undertaking activities such as building a bug hotel next to the centre, bug hunting, pond dipping, flora surveys and guided walks. The centre will also host birthday parties and corporate team building days, with many of the activities taking place in the wood. These will include shelter building using tarps, open fire cooking using the fire pit, scavenger hunts and bug hunting and pond dipping. It is hoped to have two sessions a week during the spring and summer months, possibly dropping to one or two a month during the winter. This is a new venture so over the next two years the frequency of events may increase. Other groups will be encouraged to use the centre and the wood, including after school clubs and uniformed groups, including the Scouts and Guides. Schools will be encouraged to use the centre, both those within walking distance and those further afield. This would add slightly to the current schools use of the wood, potentially seeing four extra sessions over the year, which would amount to an additional 120 children accessing the wood. The educational sessions are low impact, mainly involving guided walks and sticking to the current paths. Events will mainly take place at the centre and during 2015 two large scale events are planned. One will be the opening event for the centre in April and the other in July is a joint event with the MK Natural History Society. Both will encourage people to understand the uniqueness of the wood through low impact walks, talks and craft activities in the centre.

#### **4.20 Managing anti-social problems**

The Wood is regularly visited and patrolled by Parks Trust Operations staff and Community Rangers, along with regular work visits conducted by employed contractors and Direct Works teams. Dropped litter is picked up on weekly and monthly scheduled cycles (within the term contract) and will be supplemented by reactive and volunteer litter-picking.

Although generally small scale issues occur, such as: illicit camping, vandalism to benches & signs, small scale fires, etc., such problems will be dealt with accordingly and promptly.

#### 4.21 Productivity

In line and balanced against other woodland management objectives continue to produce woodland products from Howe Park Wood, which include:

- Timber for firewood or other markets e.g. larger roundwood (produced in combination with leaving cut wood on the wood floor for habitat value)
- Hazel stakes or binders for hedge laying purposes
- Gathering of tree and Wildflower seed e.g. gathering of Bluebell seed

#### 4.22 Monitoring and surveys

Budgets and resource allowing (e.g. the appropriately qualified people/companies available at the right times) the plan is to undertake the following surveys and monitoring work at Howe Park Wood in the stated years.

**Moth Recording** – this can be carried out by appropriate members of MK Natural History Society. One of their members have run a couple of moth trapping sessions at HPW this year, of which Parks Trust staff have helped with, so there is already some baseline data. This is something we can carry out in 2016 in combination with staff and volunteers.

**Fungi Recording** - Fungi are a very specialist group and not one readily tackled by many consultancies. We feel confident that Bucks Fungus Group would be happy to do some targeted recording at HPW for us. The contact there would be Dr. Derek Schafer who is well known to Martin Kincaid. This will be a target for 2017.

**Ground Flora** – The Parks Trust will need to bring in a professional consultant for this. We should soon receive BSG Ecology's report on the Linford Wood flora (due November 2015), so assuming that is of a standard, we would anticipate we'll use them again. We would hope to carry out a survey in 2016 or 2017.

**Common Bird Census** -These census can work out expensive so the plan is to approach Bucks Bird Group and look to explore if any of their members would be willing to undertake these surveys. We know that some of their members are very skilled in carrying out CBC and should be easy to agree a methodology. If we could come to an agreement with them as part of any agreement we could make a donation to BBG in exchange for a survey. The target year for this is 2017 although this could move to 2018.

**Pollinating Insects** - This is rather specialised and very likely to be the most expensive and time consuming survey. We did have a very good contact in Hills Erenler who carried out bee and wasp sampling at Elfield Park and Stonepit, but it is believed she has moved away from the area. This may be one that Mike LeRoy and Bucks Invertebrates Group can advise us with. We will look to undertake this one in 2018 and that will depend on finding appropriate personage to carry out such a survey and the costs are in line with available budgets.

**Saproxylic Beetles** – We would like have a repeat the Saproxylic Beetles survey that was carried out in 1999. This was a comparative study between Howe Park, Shenley and Linford Woods, to see how well they performed for beetles. We would approach a suitable ecologist to quote us for this work; the likely cost is £5,000 - £6,000. This survey will be programmed in for 2020 when perhaps the increased amount of deadwood we are leaving in the wood might be starting to show an influence.

**Study of People using the wood** - We need to carry out further studies as to numbers of people using the wood and what attracts them to the wood (e.g. dog walkers, enjoying the woodland environment or used as a through path) and we will look to do this in 2018/19.

Records of species found in Howe Park Wood are held by the Buckinghamshire & Milton Keynes Environmental Records Centre (BMERC). These include all records from the 'Ecological Studies in

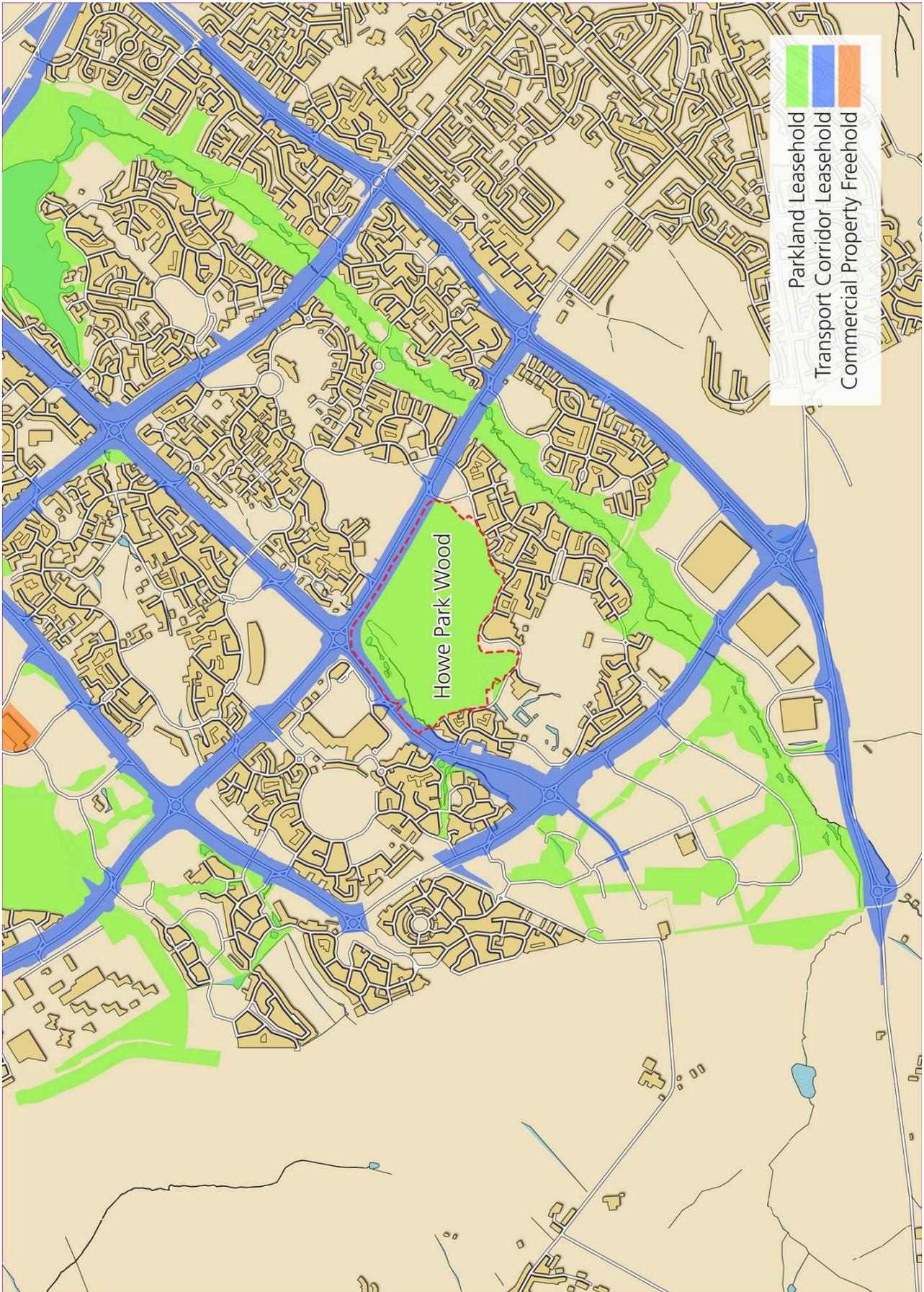
Milton Keynes' reports, but also records provided by individual ecologists and naturalists. As new studies are carried out, new records will be submitted to BMERC.

Checklists will be prepared for use within The Parks Trust and by those interested in these woodlands, to provide instant access to knowledge of what species have been recorded in these woodlands. This will also enable ecologists and naturalists to be aware of what to look for and to add records of species not yet recorded in these woods.

Plan 1: The Management Plan Boundary



**Plan 2: Ownership**



### Plan 3: Vegetation Zones & Compartment Numbers



**Plan 4: Footpaths, Rides & Car Parks**



Plan 5: Street Furniture



**Plan 6: Ponds & Water Courses**





### Plan 8: Thinning & Coppicing Operations

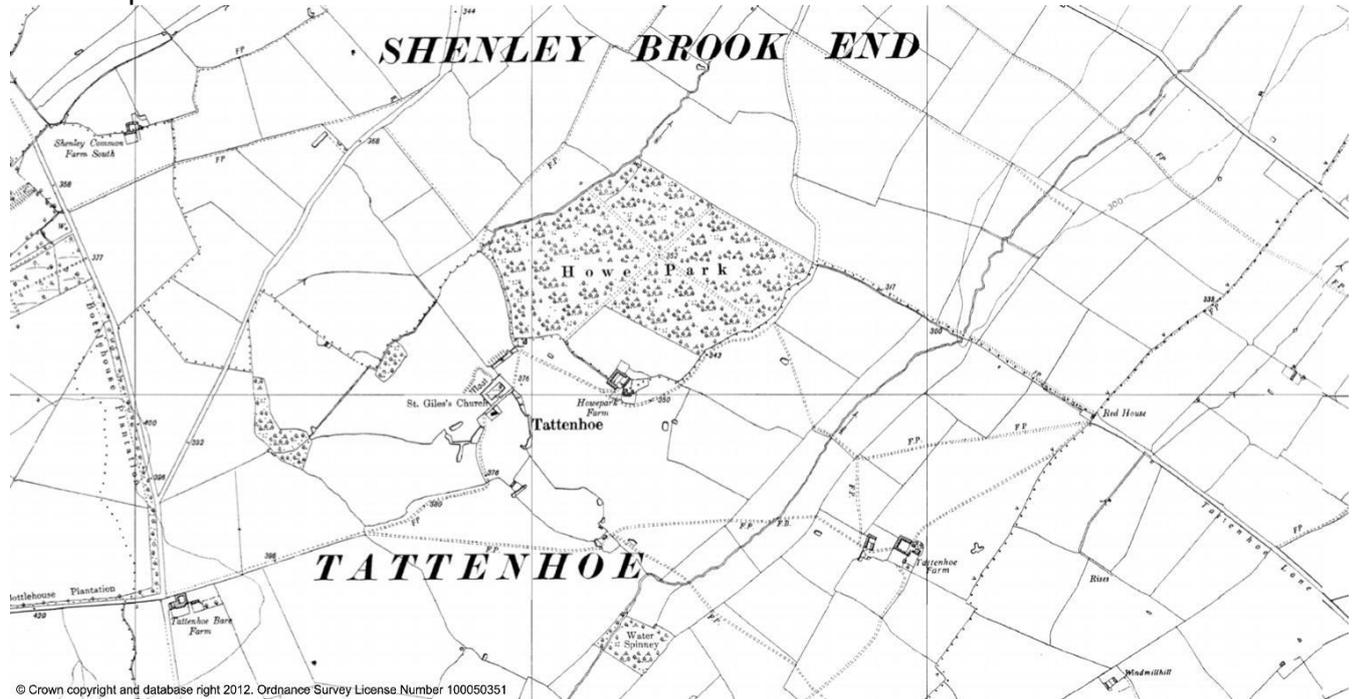


**Plan 9: Howe Park Wood and the Wider Landscape**



### Plan 10: Historic Mapping

1940s Epoch



2015



## APPENDIX 1: REPORTS AND ECOLOGICAL STUDIES

### 1 General reports

- 'Species Action Plan: Wood White *Leptidea sinapis*' MS Warren, NAD Bourn 1998 Butterfly Conservation ["Unpublished working document"]
- 'Climate change: impacts and adaptation in England's woodlands' Duncan Ray, James Morison and Mark Broadmeadow 2010 Forestry Commission England  
[http://www.forestry.gov.uk/pdf/FCRN201.pdf/\\$FILE/FCRN201.pdf](http://www.forestry.gov.uk/pdf/FCRN201.pdf/$FILE/FCRN201.pdf)
- 'Life in the Deadwood: A guide to managing deadwood in Forestry Commission forests' 2002 Forest Enterprise  
[http://www.forestry.gov.uk/pdf/lifeinthedeadwood.pdf/\\$file/lifeinthedeadwood.pdf](http://www.forestry.gov.uk/pdf/lifeinthedeadwood.pdf/$file/lifeinthedeadwood.pdf)
- 'Managing deadwood in forests and woodlands' Practice Guide: 2012 Forestry Commission Edinburgh  
[http://www.forestry.gov.uk/pdf/FCPG020.pdf/\\$FILE/FCPG020.pdf](http://www.forestry.gov.uk/pdf/FCPG020.pdf/$FILE/FCPG020.pdf)

### 2 Reports and Ecological Studies associated with Howe Park Wood

- 13. 'Bryophytes of Selected Habitats' – Mead, R (1975)
- 42. 'Terrestrial Invertebrates Part 1: Survey of Coleoptera' – Jackson, M (1979)
- 43. 'Terrestrial Invertebrates Part 2: Survey of Linford & Howe Park Woods' – Smith, AG & McCann, AG (1979)
- 61. 'Butterflies' – Brown, D & Tasker, A (1981)
- 62. 'Moths' – Brown, D & Tasker, A (1981)
- 66. 'A Survey of the terrestrial invertebrate fauna of Linford (+Stanton) and Howe Park Woods' – Smith, AG & McCann, AG (1980)
- 73. 'Survey of the butterflies in Milton Keynes' – Brown, D & Tasker, A (1982)
- 82. 'A Survey of the Larger Fungi of Milton Keynes' – Osley, NJ (1983)
- 86. 'Common Bird Census of Howe Park Wood 1983 & 1984' – R A Morgan (1984)
- 87. 'Ponds Survey 1984 & 1985' – Ridge, I (1985)
- 90. 'Vegetation Survey of Howe Park Wood 1984' – Cobham Resource Consultants (1984)
- 93. 'Howe Park Wood Management Plan 1985-1989' – Cobham Resource Consultants (1984)
- 104. 'Common Bird Census of Howe Park, Linford and Shenley Woods' – Tasker, A (1987)
- 121. 'Common Bird Census of Howe Park, Linford and Shenley Woods 1993' – Phillips, J (1993)
- 122. 'A Survey of the distribution of bats in parkland of Milton Keynes' – North Bucks Bat Group (1993)
- 130. 'A Survey of Dragonflies in Milton Keynes' – Phillips, NJ (1995)

- 132. 'Howe Park Wood Vegetation Survey 1995' – Francis, Dr JL (1995)
- 133 'A Survey of the Saproxyllic Coleoptera of Howe Park, Linford and Shenley Woods' – Plant, CW (1996)
- 141. 'A Survey of Moths at Selected Sites in Milton Keynes in 1999' – Townsend, M (2000)
- 144. 'A Survey of Butterflies at six selected sites in Milton Keynes 2002-2003' – Townsend, M (2004)
- 150. 'Common Bird Census of Howe Park, Linford and Shenley Woods' – Middlemarch Environmental (2007).
- 258. Howe Park Wood Badger Sett – Bernwood 2015
- 265 Howe Park Wood Great Crested Newts, Post Development Monitoring and Assessment – Bernwood 2015

## **APPENDIX 2: CONCLUSIONS OF SELECTED 'ECOLOGICAL STUDIES IN MILTON KEYNES REPORTS AND THEIR IMPLICATIONS FOR SITE MANAGEMENT OF HOWE PARK WOOD**

This section summarises the 'Ecological Studies in Milton Keynes' reports of most significance for an understanding of Howe Park Wood and it covers the management recommendations made within these. Summaries of this Appendix are included in the main report above. When these studies were completed the recommendations of individual studies had to be weighed with recommendations from other studies and against the overall objectives for the Wood. Some recommendations were implemented in subsequent management, many remain of relevance for future management of Howe Park Wood.

Management planning should be based on an objective understanding of the history of woodland management and historical ecology of a site compared with a contemporary understanding of its biodiversity and condition. It is therefore important to recognise that the remarkable range and depth of ecological studies of Howe Park Wood date largely from the period 1979 to 1996, with only a few more since then.

What follows are the most relevant of the above reports, with particular relevance to the ongoing management of Howe Park Wood, with summaries of most of them.

### **'Bryophytes of Selected Habitats' – Mead, R (1975) (Ecological Study No. 13)**

### **'Terrestrial Invertebrates Part 1: Survey of Coleoptera' – Jackson, M (1979) (Ecological Study No. 42)**

A more extensive study of Coleoptera in Howe Park Wood was carried out as part of 'A Survey of the Saproxyllic Coleoptera of Howe Park, Linford and Shenley Woods' – Plant, CW (1996) (Ecological Study No. 133b)

### **'Terrestrial Invertebrates Part 2: Survey of Linford & Howe Park Woods' – Smith, AG & McCann, AG (1979) (Ecological Study No. 43)**

### **'Butterflies' – Brown, D & Tasker, A (1981) (Ecological Study No. 61)**

A more extensive study of butterflies in Howe Park Wood was carried out as part of 'A Survey of Butterflies at six selected sites in Milton Keynes 2002-2003' by Townsend, M (2004) (Ecological Study No. 144).

### **'Moths' – Brown, D & Tasker, A (1981) (Ecological Study No. 62)**

A more extensive study of moths in Howe Park Wood was carried out as part of 'A Survey of Butterflies at six selected sites in Milton Keynes 2002-2003' by Townsend, M (2004) (Ecological Study No. 141).

### **'A Survey of the terrestrial invertebrate fauna of Linford (+Stanton) and Howe Park Woods' – Smith, AG & McCann, AG (1980) (Ecological Study No. 66)**

Selected sites of potential interest for fungi were surveyed throughout Milton Keynes in autumn 1982 and spring 1983. 212 fungi species were identified, of which 142 were mushrooms or toadstools; the other 70 were smaller forms of fungi. The richest site for fungi was Linford Wood. It had 144 (over half) of the different species found at all sites surveyed in Milton Keynes. Howe Park Wood had 46 species of which 11 were recorded. It was thought to have fewer species than Linford Wood not only because it is a smaller woodland and less coppicing had been done at Howe Park, but also because the dense understorey with bare soil and spare leaf litter provided insufficient substrate for fungi to grow. Where clearings had become occupied by coarse grass and Bramble *Rubus fruticosus* there were fewer of the larger fungi. Osley reported disappointment at not finding associates of Hornbeam, *Lactarius circellatus* and *Leccinum carpini* in Howe Park Wood.

### **'Survey of the butterflies in Milton Keynes' – Brown, D & Tasker, A (1982) (Ecological Study No. 73)**

A more extensive study of butterflies in Howe Park Wood was carried out as part of 'A Survey of Butterflies at six selected sites in Milton Keynes 2002-2003' by Townsend, M (2004) (Ecological Study No. 144).

**‘Common Bird Census of Howe Park Wood 1983 & 1984’ – R A Morgan (1984) (Ecological Study No. 86)**

Four Common Bird Censuses have been carried out which cover Howe Park Wood. The results are presented in this 1984 report (Ecological Study No. 86), a 1987 report (Ecological report No. 104), a 1993 report (Ecological Study No. 121), and in a 2007 report (Ecological Study No. 150) which summarised evidence from the three earlier reports. A summary is provided below in relation to Ecological Study No. 150.

**‘Ponds Survey 1984 & 1985’ – Ridge, I (1985) (Ecological Study No. 87)**

A more extensive study of ponds within Howe Park Wood was carried out as part of ‘Howe Park Wood Vegetation Survey 1995’ by Francis, Dr JL (Ecological Study No. 132).

**‘Vegetation Survey of Howe Park Wood 1984’ – Cobham Resource Consultants / MJS Slatter (Ecological Study No. 90)**

The 1984 Vegetation Survey report by Cobham Resource Consultants (CRC) makes reference to a previous study carried out in 1974 by John Kelcey, an ecologist with Milton Keynes Development Corporation. Perhaps the most significant find by John Kelcey which the 1984 report recounts was a hybrid grass species found by him alongside Ride 3 (the ride running from the central cross-road to the southern edge of the Wood near Stolford Rise). Identification of the hybrid *Glyceria declinata* x *G. fluitans* (Small Sweet-grass x Floating Sweet-grass, which is male-sterile) was apparently confirmed at the time by CE Hubbard of the Royal Botanical Gardens at Kew.

The 1984 survey was carried out before the National Vegetation Classification for Woodlands which was published in 1991 (‘British Plant Communities Volume 1: Woodlands and Scrub’ edited by JS Rodwell) so it applied an earlier methodology developed by George Peterken. The survey was carried out of all plants found in the 89 cells of 50m x 50m which covered the woodland but it did not include the buffer zones around its edges. In each cell two quadrats were surveyed, one of 10 m<sup>2</sup>, the other of 1 m<sup>2</sup>. Soil samples were recorded at each cell and separate surveys were done of: the three ponds and the streams within the woodland; as well as of the rides and associated ditches.

A full plant species list was provided in Table 5 which lists in separate columns species found in: Woodland, Ride & Ditch, and Ponds. This also indicates four sources for this data: 1) John Kelcey’s 1974 report; 2) Milton Keynes Natural History Society records between 1970 and 1976; 3) The 1984 Cobham Resources Consultants survey commissioned by Milton Keynes Development Corporation; and 4) Records held by Buckinghamshire County Museum Service dated 1979. Plans are provided which show where specific species are dominant. An additional list is provided of mosses and liverworts recorded in the Wood but these are not shown on distribution maps.

The 1984 report discusses some apparent discrepancies and possible previous mis-identifications of some species. It also notes that *Hedera helix* Ivy had been found in the 1974 survey but not in later surveys.

The brief Summary at the front of the 1984 CRC report is worth quoting in full; it says:

*“Howe Park Wood is a coppice-with-standards Domesday Woodland. It occupies 60 acres (24 Ha) on heavy calcareous soils. The main species are ash, oak, field maple, hazel and hornbeam. It has been much neglected though small areas are being managed by coppicing.*

*The area has considerable wildlife value. This report aims to show the value of the vegetation of the woodland and reveals that this value increases almost without exception where management has taken place recently. It also shows that the wetness of the ground is an important factor in the woodland diversity. The results of the survey work contained in this report lead to the conclusion that rotational coppice-with-standards management is vital in maintaining a high number and diversity of species in this important woodland area.”*

The main conclusions of CRC’s 1984 report were:

- 1) “The woodland is of ancient origin and has a high species number many of which are associated with an ancient woodland flora;
- 2) There is a direct relationship between very low species number and ‘blanket’ species whether under a dense or open canopy cover:

- 3) There is a wide range of trees and shrub species associated with the three main stand types, which are in turn associated with management practices using different length rotations for coppice with standards;
- 4) There are definite associations of wet-loving species which may be related to lower pH."

The main management recommendations of CRC's 1984 report were:

- 4) "The woodland should be retained as an important habitat and managed to maintain the species richness already present;
- 5) Any management policies must guard against invasion of blanket species as these are detrimental to management aims;
- 6) Re-introduction of coppice with standards management to the different stand types would greatly diversify the woodland. This would give a wide range of age groupings within the coppice as a whole, due to differing lengths of rotations between coppice species as well as encouraging a different ground flora;
- 7) The drainage of the woodland should not be altered as many of the more interesting species are associated with the wet ground conditions normally present;
- 8) Attention to the management of ponds, streams and rides to encourage a richer flora as described would add to the natural diversity of the woodland habitat."

The report's concern with 'blanket' species focused on vigorous and spreading shrubs and plants such as: *Rubus fruticosus* and *Urtica dioica* – but particularly under Peterken stand types 2A 'Wet Ash/Maple' on boulder clay and 9A 'Pedunculate Oak/Hornbeam' on neutral soils with poor drainage – though it also recognises that previous neglect had led to "large areas of single species ground flora ..." under Ash/Oak stands.

The 1984 report also notes that the ponds were over-shaded and required additional light which would also contribute to reducing their eutrophication. It recommended wider clearance of trees around them, particularly on their south side. It also noted that excessive scrubbing-over of streams required rotational cutting to increase light and enable waterside plants to flourish.

#### **'Howe Park Wood Management Plan 1985-1989' – Cobham Resource Consultants (1984) (Ecological Study No. 93)**

On the basis of their 1984 survey, Cobham Resource Consultants (CRC) prepared a 5-year management plan for Howe Park Wood. This contains important historical and background information. It confirms that Howe Park Wood was mentioned in the Domesday Book and is mentioned in 14<sup>th</sup> century deeds. Records from the 17<sup>th</sup> century indicate that it was then 88 acres, which had reduced to its present size of 60 acres by 1881. From 1732 until 1918 it was owned by Whaddon Hall Estate who then sold it as part of Howe Park Farm. It appears that it may have been largely clear-felled in both the First World War and the Second though some old coppice stools remained. Drains were cut in 1975 to make main paths drier and to remove surface water from three of the four compartments, but CRC thought that the wider effects of this on the Wood's ecology should be limited because of the slow lateral drainage of clay soils, though they did not provide objective evidence to substantiate this opinion.

CRC carried out a detailed inventory of the four compartments, each divided into sub-compartments and each of these divided into plots, 17 in all. For each plot they provided a table with data on: Area; Silvicultural System, Relascope Tally number (basal area); Top Height; Diameter at Breast-height (Dbh); Form; Volume per Hectare; Percentage of each tree species and of scrub; Overall Stocking; and Crop Condition. They also listed main species in: Coppice; Understorey/Field Layer; and Regeneration, as well as any new planting. Each table concludes with 'Notes and Action' with prescriptions such as "leave or selective thinning", "Light thinning of standards ... and recruit young standards", or "Good area of old trees for nature conservation". The results showed that *"the timber volumes per hectare throughout the wood, except in the Norway Spruce/Ash block and certain of the denser high forest areas, are uniformly low (average 60M<sup>3</sup>ha<sup>-1</sup>). This can be attributed to a number of factors:*

- *most notably, perhaps, a heavy 'creaming' of oak standards which is understood to have taken place in the two world wars:*
- *the lack of coppice management since the turn of the century [i.e. 1900] has meant that growth has not been concentrated in the proportion of chosen trees of singled coppice, but has gone onto scrub or unsingled coppice.*

*These have, in turn, suppressed the regeneration of timber trees.”*

The inventory of woodland trees and scrub in 1984 was:

• Ash	47%
• Thorn, Sallow and other scrub species	23%
• Field Maple	14%
• Aspen	9%
• Oak	4%
• Hornbeam	3%.

Oak was present only in large sizes or poor form except for a few one-year seedlings. Ash was in a *“healthy range of sizes”*. Hornbeam and Field Maple were mainly in larger sizes though there were a few pole-size Hornbeam, and a few previously-pollarded Hornbeam. Aspen regeneration was prolific, but as poles which required thinning if they were to become standard trees. Scrub growth was prolific and tall in many cases.

A silvicultural assessment shows that the Wood has been managed for several centuries, with varying degrees of intensity, as coppice (Hazel, Ash, Field Maple and Hornbeam) with standards (Oak and Ash). Most of the standards were removed in either the 19<sup>th</sup> or 20<sup>th</sup> centuries, with the exception of some Ash high forest and retained large coppice stools. Over the 100 years to 1984, coppice and logged-out areas were left untended. In some areas this led to prolific Ash and Aspen regeneration. In other parts of the Wood, scrub species (such as Sallow, Willow, Hawthorn and Blackthorn) have suppressed other growth. The overall result was poor timber quality in the growing stock of trees.

CRC reports that some planting was done after MKDC took over the Wood. This was done in some areas which were coppiced by the Milton Keynes Natural History Society. Further assessment was provided of the successes and failures of more recent management.

CRC's assessment was that each of the four compartments had several stand types with very variable tree cover which made management prescriptions difficult on a compartment basis. They saw this as a reason why systematic coppicing has not yet taken place. Where small areas had been coppiced some small area of planting had been implemented, apparently to make up for low coppice stool density. The success of planting of Field Maple and Hornbeam had been highly variable, with almost total failure in some areas and 100% success in some nearby areas. They speculated on the range of possible reasons for this. They also reported that natural regeneration of timber species had been poor, other than Ash and Aspen which had been prolific despite competition with scrub which had largely not been cleared.

As a basis for management recommendations, CRC reviewed the range of uses of the Wood, for: recreation, nature conservation and wood produce. They set the aim of the plan as *“to prescribe vegetation and recreational management objectives in order to create and maintain an ecologically- and aesthetically-rich woodland capable of providing for the various and changing needs of the local population. At the same time, the Plan aims to ensure that the woodland vegetation is adequately and continually rejuvenated and protected from recreation damage”*. To achieve this over-arching aim they proposed seven objectives. In brief, these related to:

1. Balanced age structure
2. Active conservation
3. Recreation
4. Overall wooded appearance and variety of visual types and views
5. Educational use
6. Woodland products
7. A monitoring system for the woodland ecology.

Each aim was then elaborated with specific proposed actions and management techniques. These are well worth reading in full. They then summarised priorities and explained that most of their proposed objectives could be met by management aimed at:

- *“creating a ‘normal forest’ structure (balanced age class) of native species”*; and
- *“zoning different uses”*.

CRC then set out methods for carrying out of the objectives. The management types they proposed can be summarised as:

1. Irregular Shelterwood
2. Coppice-with-Standards
3. Rotational Scrub Cutting
4. Non Intervention areas (to be reviewed every 10 years).

Each management type was to be clustered within particular areas. They discussed the merits of natural regeneration (more appropriate for Ash) and planting (probably necessary for Oak), the necessity of scrub control to achieve this and, particularly for Oak, absence of shade and competing scrub.

The CRC short-term plan (1985-1989) was to be achieved by:

1. Irregular shelterwood areas in compartments 2 & 3
2. Coppice-with-standards areas in compartments 2, 3 & 4
3. Scrub rotation and ride clearance areas in compartments 1, 3 & 4
4. Non-intervention in areas of compartments 1 & 4.

Annual plans for 'Forest Operations' are then summarised, with provision for Compartment 1 to be worked on by Milton Keynes Natural History Society.

The CRC management plan then set out 'Guidelines for Management of Growing Stock' before setting out four proposals for recreation provision:

- Car-park/s to be provided with nearby information board/s
- Graphic signs to show footpaths and features of interest
- Road signs to 'Howe Park Woodland' to distinguish it from a housing area
- Two wooden benches for each car-park.

The final main section is 'Notes on General Management and Administration'. This includes recommendations for record keeping, which should include records of change and progress in each sub-compartment, and for a full ecological survey to be carried out every five years, and for this to be supplemented by panoramic photographs to record structural changes in the vegetation of each quadrat.

**'Common Bird Census of Howe Park, Linford and Shenley Woods' – Tasker, A (1987) (Ecological Study No. 104)**

Four Common Bird Censuses have been carried out which cover Howe Park Wood. The results are presented in this 1987 report (Ecological Study No. 104), a 1984 report (Ecological report No. 86), a 1993 report (Ecological Study No. 121), and in a 2007 report (Ecological Study No. 150) which summarised evidence from the three earlier reports. A summary is provided below in relation to Ecological Study No. 150.

**'Common Bird Census of Howe Park, Linford and Shenley Woods 1993' – Phillips, J (1993) (Ecological Study No. 121)**

Four Common Bird Censuses have been carried out which cover Howe Park Wood. The results are presented in this 1993 report (Ecological Study No. 121), in the earlier 1984 report (Ecological report No. 86) and 1987 report (Ecological Study No. 104), and in a 2007 report (Ecological Study No. 150) which summarised evidence from the three earlier reports. A summary is provided below in relation to Ecological Study No. 150.

**'A Survey of Dragonflies in Milton Keynes' – Phillips, NJ (1995) (Ecological Study No. 130)**

**'A Survey of the distribution of bats in parkland of Milton Keynes' – North Bucks Bat Group (1993) (Ecological Study No. 132)**

**'Howe Park Wood Vegetation Survey 1995' – Francis, Dr JL (Ecological Study No. 132)**

A comprehensive study of the vegetation of Howe Park Wood was carried out in 1995 by Dr Joanna Francis. She used the same methodology for her studies of Linford Wood (1993) and Shenley Wood (1994) which enables useful comparisons to be made of these three Semi-Ancient Woodlands.

The methodology used was standard NVC (National Vegetation Classification) survey techniques. Surveys were carried out of: canopy, understorey and field layer species and other features such as soils and hydrology. Additional surveys were made of rides, ditches and ponds.

The study involved identification of all tree, shrub and field layer plant species within 80 (50m x 50m) grid-squares, which covered almost all of the Wood. The canopy and understorey were surveyed in 10m x 10m plots within each of the grid squares and, for each, a list of the field layer species was compiled. Plants in a 4m x 4m quadrat within each of these 10m x 10m plots were comprehensively surveyed. The methodology required identification of all flowering plants, assessment of the abundance of each species found, total vegetation cover, vegetation height and other factors. Ride, path, ditch and pond flora were recorded separately through an additional 96 quadrats. Further species-specific searches were made throughout the Wood to provide additional data on rarer species.

174 species were found in the field layer, understorey and canopy of Howe Park Wood at the time of this 1995 study. A total of 128 species were recorded from the field layer and 130 were found along the rides and ditches, though some of the ride and ditch vegetation was not generally found elsewhere in the Wood. Some comparisons were made with previous vegetation surveys carried out in the 1970s and 1984. Dr Francis noted the importance of understanding that this kind of woodland system is complex and dynamic and that many changes in field layer communities may be temporary. Where the following species were found they probably indicate some increase in soil fertility and disturbance [this may relate to an increase in dog faeces, or to previous burning or dieback of scrub clearance]; the species are: Ground-ivy *Glechoma hederacea*, Common Nettle *Urtica dioica* and Hogweed *Heracleum sphondylium*. One species that seemed to have declined between the 1984 and 1995 surveys was Primrose *Primula vulgaris*, which may be because of shading out by Blackthorn. Another species, Early Purple-orchid *Orchis mascula*, appeared to have increased, probably because of increased light levels.

Twelve NVC stand types were found in Howe Park Wood:

- W8: Ash-Maple-Mercury woodland
- W8a *Primula vulgaris* and *Glechoma hederacea* sub-community
- W8b *Anemone nemorosa* sub-community
- W8c *Deschampsia cespitosa* sub-community
- W6d *Alnus glutinosa-Urtica dioica* sub-community
- W7 Ash-Alder woodland
- W9a Typical sub-community of Ash-Rowan-Mercury woodland
- W21 Atlantic Hawthorn scrub
- W21b *Mercurialis perennis* sub-community
- W22 Blackthorn-Bramble scrub
- W22a *Hedera helix* and *Silene dioica* sub-community
- W22b *Viola riviniana* and *Veronica chamaedrys* sub-community
- W24a Bramble-*Holcus lanatus* underscrub.

The most frequent stand types were: W8a *Primula vulgaris-Glechoma hederacea* sub-community of Ash-Maple-Mercury woodland; and *Viola riviniana* and *Veronica chamaedrys* sub-community of Blackthorn-Bramble scrub. The frequency of the W22b *Viola riviniana* and *Veronica chamaedrys* sub-community is indicative of non-intervention areas where Blackthorn *Prunus spinosa* had become dominant with almost impenetrable thickets.

As a whole, Howe Park Wood's NVC classification was determined to be W8 Ash-Maple-Mercury woodland. Characteristic species of the W8 stand type (not all of which were found in Howe Park Wood) are:

- Core species: Field Maple *Acer campestre*, Hazel *Corylus avellana*, Ash *Fraxinus excelsior*, Dog's Mercury *Mercurialis perennis* and Bramble *Rubus fruticosus*
- Field layer: Bluebell *Hyacinthoides non-scripta*, Enchanter's Nightshade *Circaea lutetiana*, Wood Avens *Geum urbanum*, Lords-and-Ladies *Arum maculatum*, Dog's Mercury *Mercurialis perennis*, Common Dog-violet *Viola riviniana* and Early Dog-violet *Viola reichenbachiana*.

The eight management compartments of Howe Park Wood were of the following NVC types and sub-communities:

- W22 Blackthorn-Bramble scrub

1A	W22b	<i>Viola riviniana</i> and <i>Veronica chamaedrys</i> sub-community
	W8	Ash-Maple-Mercury woodland
1B	W8a	<i>Primula vulgaris</i> and <i>Glechoma hederacea</i> sub-community
1C	W8a	<i>Primula vulgaris</i> and <i>Glechoma hederacea</i> sub-community
2	W8b	<i>Anemone nemorosa</i> sub-community
3A	W8a	<i>Primula vulgaris</i> and <i>Glechoma hederacea</i> sub-community
3B	W8a	<i>Primula vulgaris</i> and <i>Glechoma hederacea</i> sub-community
4A	W8a	<i>Primula vulgaris</i> and <i>Glechoma hederacea</i> sub-community
4B	W8a	<i>Primula vulgaris</i> and <i>Glechoma hederacea</i> sub-community

### **Canopy**

In Howe Park Wood only 15% of sampled quadrats had canopy cover between 81-100% (in Linford Wood the majority of sample quadrats had this level of cover). The main canopy species at Howe Park were:

- Ash *Fraxinus excelsior* (in 79% of the quadrats; compared with 93% at Linford Wood)
- Aspen *Populus tremula* (in 39% of quadrats; infrequent at Linford Wood)
- Field Maple *Acer campestre* (in 36% of quadrats; 55% at Linford Wood)
- Hornbeam *Carpinus betulus* (in 19% of quadrats; in one compartment at Linford Wood)
- Pedunculate Oak *Quercus robur* (in 19% of quadrats; 49% at Linford Wood).

It is notable that Oak was only present as an occasional timber tree and that these were often overshadowed by emergent Ash maidens. This is uncharacteristic of old W8 woodlands which usually have far more Oak standards and old coppice Oak stools. It demonstrates previous management through which most Oaks were removed as timber.

Howe Park Wood does have a few sizable old Crab Apple *Malus sylvestris*, but lacks Wild Service-tree *Sorbus torminalis* which is usually a characteristic tree of W8 woodlands. Aspen *Populus tremula* occurred in relatively high numbers in widespread groups, more than is common for this kind of wood, but Wild Cherry *Prunus avium*, another W8 species, was not found at all.

Hornbeam as a canopy species is more characteristic of the clay soils of East Anglia and the Weald of Kent and of clay-over-flints over part of chalkland areas, though there are a few patches in the Midlands of the Peterken 9Ab Ash-Maple variant of Pedunculate Oak-Hornbeam woodlands, of which this appears to be one. George Peterken made a personal observation to Dr Francis that it is best to assume that the Hornbeam in Howe Park Wood are of native origin (so were not introduced). Hornbeam is a species which in dense stands has an impoverished field layer beneath it.

### **Understorey**

Only 53% of sampled quadrats had more than 60% understorey cover and in many of these it was because they were dominated by Blackthorn scrub. The most dominant understorey species were:

- Blackthorn *Prunus spinosa* (present in 74% of sampled quadrats)
- Hazel *Corylus avellana* (present in 64% of sampled quadrats).

Hazel was found throughout the Wood, but was virtually absent where Blackthorn was dominant.

### **Underscrub**

Four characteristic underscrub species were found throughout the Wood: Bramble *Rubus fruticosus*, Dog-rose *Rosa canina*, Dewberry *Rubus caesius* and ground-growing Honeysuckle *Lonicera periclymenum*.

### **Field layer**

The species most widespread in the field layer, and found in over 60% of quadrats, can be divided into those associated with drier areas and those in wetter areas. The distribution of these species of dryer and wetter areas is uneven across the Wood because some areas hold water more than others.

All the following field layer species found in Howe Park Wood are characteristic of NVC type W8 woodlands:

#### *Drier areas:*

- Bluebell *Hyacinthoides non-scripta*
- Hairy St John's Wort *Hypericum hirsutum*

- Dog's Mercury *Mercurialis perennis* (only in small, scattered populations in only two compartments, probably reflecting the wetness of most other areas of the Wood)
- Greater Stitchwort *Stellaria holostea*.

*Wetter areas:*

- Tufted Hair-grass *Deschampsia cespitosa*
- Pendulous Sedge *Carex pendula*
- Wood Small-reed *Calamagrostis epigejos*
- Rushes *Juncus spp.*

Another influence on the distribution of field layer species is the amount of light they receive, so some are concentrated along rides and paths (particularly those that are east-west and those without hard surfaces and ditches) others are hidden within the more shaded areas. Dr Francis noted that a main effect of increased woodland management since 1984 had been to raise light levels and increase plant diversity, though ground disturbance had also caused some ruderal (wasteland) species to proliferate.

Seven rarer plants were present or locally abundant in Howe Park Wood. These were:

- Thin-spiked Wood-Sedge *Carex strigosa*
- Broad-leaved Helleborine *Epipactis helleborine*
- Dog's Mercury *Mercurialis perennis*
- Early-purple Orchid *Orchis mascula*
- Herb Paris *Paris quadrifolia*
- Greater Butterfly Orchid *Platanthera chlorantha*
- Goldilocks Buttercup *Ranunculus auricomus*.

31 of the species recorded in Howe Park Wood in 1995 were southern Ancient Woodland Indicators (AWI); 7 were trees & shrubs, the other 24 were field-layer species. AWI plants tend to have poor dispersal mechanisms and are only weakly competitive, which is why they are characteristic of old, undisturbed woodland.

The 7 AWI trees and shrubs were:

- Field Maple *Acer campestre*
- Midland Hawthorn *Crataegus laevigata*
- Holly *Ilex aquifolium*
- Crab Apple *Malus sylvestris*
- Aspen *Populus tremula*
- Field-rose *Rosa arvensis*
- Guelder-rose *Viburnum opulus*.

The 24 AWI field layer species found were:

- Wood Anemone *Anemone nemorosa*
- Hairy-brome *Bromopsis ramosa*
- Wood small-reed *Calamagrostis epigejos*
- Pendulous sedge *Carex pendula*
- Remote Sedge *Carex remota*
- Wood-sedge *Carex sylvatica*
- Thin-spiked Wood-sedge *Carex strigosa*
- Pignut *Conopodium majus*
- Broad-leaved Helleborine *Epipactis helleborine*
- Giant Fescue *Festuca gigantea*
- Creeping Soft-grass *Holcus mollis*
- Bluebell *Hyacinthoides non-scripta*
- Hairy Wood-rush *Luzula pilosa*
- Great Wood-rush *Luzula sylvatica*
- Wood Millet *Milium effusum*
- Early-purple Orchid *Orchis mascula*
- Herb Paris *Paris quadrifolia*

- Butterfly Orchid *Platanthera chlorantha*
- Wood Meadow-grass *Poa nemoralis*
- Barren Strawberry *Potentilla sterilis*
- Primrose *Primula vulgaris*
- Goldilocks Buttercup *Ranunculus auricomus*
- Black Bryony *Tamus communis*
- Bush Vetch *Vicia sepium*.

Seven specific management recommendations were made. They were:

8. Maintenance of Blackthorn scrub  
The existing Blackthorn *Prunus spinosa* community should be maintained because of its importance for the two populations of the very rare Black Hairstreak *Strymonidia pruni* butterfly found in the Wood during 1995; but Blackthorn should not become so dominant that it leads to a reduction in overall species diversity in the Wood. This butterfly is confined to limited areas of ancient woodland on the Midland clay-belt and its larvae feed on Blackthorn. It mainly requires bushes older than 20 years, so a continuity of this habitat with a range of age-classes is required and the continuing development of younger shrubs.
9. Maintenance of soil moisture levels  
It is important to maintain soil moisture levels on which many AWI species in W8 woodland, such as Lesser Celandine *Ranunculus ficaria* and various Sedge *Carex* species depend, particularly because some characteristic species of wet woodland would be more prolific if not shaded out by Blackthorn thickets.
10. Rare species  
All of the rare plant species in Howe Park Wood relate to coppiced woodlands, so should be capable of being sustained by continued rotational coppice management. Many of the rarer field layer species exist vegetatively in shady, undisturbed areas but can proliferate in recently cleared areas before competing plants build up. For Thin-spiked Wood-sedge *Carex strigosa* soil moisture levels are important so need to be sustained along with suitable habitats for its growth including bank and ditch sides.
11. Control of Bramble *Rubus fruticosus*  
In general, Bramble is less of a problem in most of Howe Park wood than is generally the case elsewhere, though it has required control by regular cutting in the east of Compartment 2, and is controlled in some other area by Blackthorn out-competing it. In fact Bramble provides an excellent nectar sources for many invertebrates, but may need some limited management in some open areas.
12. Maintenance of ancient woodland characteristics  
Management of Howe Park Wood should aim to maintain its special characteristics as a good example of W8 ancient woodland and as an SSSI:
  - If chippings are used for paths they should be from the wood, not introduced from other sites [this is a Natural England SSSI requirement in any case]
  - Avoid bonfires or site them where their damage to plants and soil enrichment will have least effect
  - Ash and Hornbeam tend to naturally regenerate in this Wood
  - Enhancement of Hazel should be by layering rather than introducing new stock
  - Any further tree planting should be of stock of local provenance [i.e. from this ancient woodland or another nearby].
13. Deadwood  
The practice of maintaining an ongoing range of types of deadwood in Howe Park Wood should be continued, to benefit saproxylic invertebrates and a good range of fungi. The most valuable deadwood resources are: snags, standing deadwood and hollow trees, but fallen deadwood is also of importance.
14. Visitors

Inevitably visitors have impacts on this woodland as they enjoy it. The reasons why this ancient woodland is special should be explained so that people understand how and why it needs to be respected and treated sensitively, and why particular management activities are carried out. This information could be conveyed on interpretation boards erected within the woodland. The Wood can also provide a very useful educational resource.

**'A Survey of the Saproxyllic Coleoptera of Howe Park, Linford and Shenley Woods' – Plant, CW (1996) (Ecological Study No. 133b)**

The aim of the survey was to collect data on the deadwood beetle fauna of three woodlands, to provide an adequate database to enable The Parks Trust to monitor future management works. At least ten survey visits were made to each of the three woodlands over the period April to October 1996. The list of 241 beetles it provided was of all types of beetle and seven of these were associated with "saproxyllic habitats in ancient pasture woodland", six of which were found in Howe Park Wood. But there are other beetle species which are not strictly associated with ancient pasture woodland and may occur in woodland or at other sites with deadwood. Of the 20 of these species found in the three woodlands, 14 were found at Howe Park Wood.

Of the 200 beetle species recorded for the three woods, 141 were found in Howe Park Wood, which was fewer than for Shenley Wood (165 species) but more than for Linford Wood (132) which is a considerably larger wood than the other two.

Of the beetle species found in Howe Park Wood, the following were of national rarity importance status as designated at that time (those marked with an asterisk are saproxyllic beetle species):

- \* *Prionychus ater* (Alleculidae family, close to Darkling beetles): Status Notable B
- *Phytoecia cylindrica* (a longhorn beetle): Status Notable B
- *Longitarsus parvulus* (a leaf beetle): Status Notable A
- \* *Opilo mollis* (a chequered beetle): Status Notable B
- \* *Platycis minuta* (a net-winged beetle): Status Notable B
- \* *Ischnomera caerulea* (Oedemeridae family): Status RDB3 (Red Data Book 3)
- \* *Platypus cylindrus* (the only Platypodidae species in Europe): Status Notable B.

One conclusion was that the past felling of trees and the associated clearance of dead timber had left the three woods with a relatively small deadwood resource, and that deadwood left on the ground was generally too recent to be of particular value to deadwood species of beetle. As the deadwood resource ages and is increased, by management which leaves standing deadwood and fallen deadwood, "the saproxyllic beetle fauna will not, sadly, suddenly undergo a dramatic increase in diversity. It will increase, but this rise will be slow and gradual over a great many years." "Saproxyllic species are extremely sedentary, often restricting themselves to a single tree or log in the case of some species".

A further conclusion was that although saproxyllic beetles are indicators of the deadwood habitat, "a great many other invertebrate groups are also dependent upon this ecological niche" and that improvement of this habitat is likely to be of benefit to most of these other groups. It was therefore suggested that future monitoring should test this by recording other, easily-recorded species such as some of the hoverflies and craneflies which breed in rot-holes, as well as beetles.

Usefully, Colin Plant's study listed 155 other invertebrates found during his surveys of the three woods, 152 of which were True Flies (Diptera). Of these Diptera species, 137 were found in Howe Park Wood.

Another conclusion was that "...the present management regime appears to be working, and some suggestions for further management into the future are proposed." These were:

1. Though any deadwood can be of value, "... timber of a large diameter – both standing and fallen – is especially important". It was suggested that selected species of a variety of species, including Oak *Quercus robur*, should be felled and left to decay.

2. "The simplest rule about dead wood is that it should be left where it is to undergo natural decay ... Cutting up and removing, or burning dead and fallen trunks or major branches is a reprehensible act which can never be justified in conservation terms."
3. "If it is necessary to move fallen timber it should be moved into partial shade ... the richest fauna tends to be supported by material in partial shade". "Large trunks should be dragged to their new position without being cut into convenient smaller sections."
4. "Timber which is truly in excess of requirements should be stacked to form loose log-piles whilst finer materials can be used to make litter piles. A few large piles are to be preferred over several smaller ones."
5. "The position of any very old trees and any trees with sap runs or rot holes, splits ... and those regularly producing bracket fungi should be carefully noted and the trees preserved throughout any management programme. It is not good conservation practice to attempt to increase the fallen dead wood resource by selecting for felling trees which are already dead or diseased ... When management calls for a reduction in the number of trees the younger and healthier ones should be selected for felling."
6. "Cut stumps should not be killed or chemically treated but left to regenerate or decay as nature dictates. Dead stumps, and particularly decaying rootstocks, have a distinctive and important saproxylic fauna, which includes some of our rarest hoverflies."
7. "A potential problem ... is that of maintaining the continuity of suitable timber. Modern day small and isolated woodland units tend to be dominated by trees which are all, very broadly, of equal age and this has serious implications for the future maintenance of the stock of dead timber. The thinning programme ... has been carefully designed with this problem in mind and is an excellent start ... a management programme should be regarded as an ongoing programme. ... Provision needs to be made now for assessment of the overall timber resource at regular intervals of, perhaps, in the order of fifteen years and a flexible but long-term management plan for this resource (for the next hundred years or more) should be committed to paper."

**'A Survey of Moths at Selected Sites in Milton Keynes in 1999' – Townsend, M (2000)  
(Ecological Study No. 141)**

In 1999, moths were studied at six sites in Milton Keynes including the three ancient woodlands, by light-traps and direct searching between April and November. The overall species total found at each of these sites was between 350 and 400, not untypical for southern England. Three measures of biodiversity were applied: 'Species Richness' (number of species present), 'Diversity' (Alpha Diversity Index), 'Species Quality Index' (SQI related to the rarity of species). Martin Townsend's report makes the point that: *"1999 was generally considered to be a poor year both for weather and insect numbers, which are in any case known to vary considerably from year to year, even for the same species. For this reason, it is likely that a small number of species, particularly the scarcer ones, may have been missed from some or all of the sites during the survey."*

Twelve light-trapping sessions were carried out at each of six trapping sites in Howe Park Wood (once in April, twice per month from May to September, and once in October). In addition some direct night and daytime searching for adults and larvae was carried out using nets and beating, as well as searches for larvae exit holes and pupal exuviae.

Of the three ancient woodlands, Shenley Wood was of the highest value. Linford Wood came next on one score, but Howe Park was ranked higher because of the higher number of rarer or more local species. It was suggested that what distinguished Shenley Wood might be that *"earlier and more drastic management"* had taken place here than in the other two ancient woodlands.

In Howe Park Wood, 6,436 individual moths were light-trapped which were of 209 different species; and a further 8 species were found, giving a total of 217 species. Of these, 2 were Notable B species and 27 were of Nationally Local Status.

The two of Notable B Status were:

- Light Orange Underwing *Archiearis notha*
- Mere Wainscot *Photedes fluxa*.

The 27 species of Nationally Local Status, many of which have specialised habitat requirements, were:

- Poplar Lutestring *Tethea or*
- Maiden's Blush *Cyclophora linearis*
- Large Twin-spot Carpet *Xanthorhoe quadrfasiata*
- Seraphin *Lomophora halterata*
- Lilac Beauty *Apeira syringaria*
- Chocolate-tip *Clostera curtula*
- Black Arches *Lymnantria monacha*
- Buff Footman *Eilema deplana*
- Least Black Arches *Nola confusalis*
- Lead-coloured Drab *Orthosia populeti*
- Slender Brindle *Apamea scolopacina*
- Rufous Minor *Oligia versicolor*
- Scarce Silver-lines *Bena prasinana*
- Oak Nycteoline *Nycteola revayana*
- Beautiful Hook-tip *Laspeyria flexula*
- Round-winged Muslin *Thumatha senex*
- Olive *Ipimorpha subtusa*
- Pinion-streaked Snout *Schrankia costaestrigalis*
- Fen Wainscot *Arenostola phragmitidis*
- Barred Rivulet *Perizoma bifrasciata* [a grassland species]
- Maple Pug *Eupethecia simpliciat*
- White-spotted Pug *Eupethecia haworthiata*
- Scarce Footman *Eilema complana*
- Gothic *Naenia typical*
- Lunar-spotted Pinion *Cosmia pyralina*.

Other species which are relatively uncommon in Buckinghamshire were also found at Howe Park Wood:

- Chevron *Eulithis testata*
- Red-green Carpet *Chloroclysta siterata*
- Streak *Chesias legatella*
- Garden Dart *Euxoa niigricans*
- Merveille de Jour *Dichonia aprilina*
- Small Wainscot *Photedes pygmina*.

The lower number of species and lesser diversity and species richness scores for Howe Park Wood in comparison to Shenley Wood were attributed to different recent management with resumption of coppicing in Howe Park Wood later than in Shenley Wood. On the other hand, species collected at Howe Park included a larger number of non-woodland species which may reflect the presence of more of a grassland edge around this Wood.

A Rothamsted light trap had been operated at Howe Park Wood every night of the year from 1970 to 1977 as part of a national network of these traps. A total of 292 species had been trapped over this period with an annual mean of 13,209 individuals being trapped. These figures are not directly comparable with those from Martin Townsend's 1999 survey as the two types of trap use different light sources and operate in different ways. In particular, the Noctuidae family are caught less frequently in Rothamsted traps and moths flying higher from the ground are less frequently caught in Rothamsted traps. Although 38 of the species recorded from the Rothamsted trap were not found in the 1999 survey, Martin Townsend provides reasons for this. Some were species dependent on Elm *Ulmus spp.* which was still common in the 1970s and he considers it possible that other species absent from the 1999 survey may still be found in Howe Park Wood. He also notes that 1976, when the Rothamsted trap was in operation, was the most remarkable in the 20<sup>th</sup> century for moth numbers and dispersal. He supported his case with evidence of a light-trapping survey carried out in 1981

which found other species in Milton Keynes, but he also recognised that some species may have been lost from the Milton Keynes area, or have reduced, because of urban development and general tidying up of their habitat.

The report says: "In Linford Wood, everything possible should be done to encourage regeneration and spread of the small area of Aspen *Populus tremula* present. It is unlikely that Light Orange Underwing [*Archiearis notha*] is present, but a number of other species would benefit, such as the nationally local Poplar Lutestring [*Tethea or or*]."

The report says: "One aspect of the management of all the woods that could be improved is that of the woodland edges. In many places, the grass is mown right up to the edge of the wood. This is particularly noticeably at Shenley and Linford, but also occurs on at least one side of Howe Park. An uncut margin of up to 5 metres would allow a woodland edge to develop, with uncut grassland and emergent scrub, along with a further zone that is only cut in late summer. This would be highly beneficial, and would also be more aesthetically pleasing".

It also says: "The larvae of the Mere Wainscot [*Chortodes fluxa*], a woodland specialist which is present in all three woods, only feeds in the stems of Wood Small-reed [*Calamogrostis epigejos*], which grows in the rank vegetation of damp rides and clearings. Therefore, the maintenance of this habitat is essential for the survival of this moth. The eggs are laid in a leaf-sheath in July and August and the larvae feed until the following day, when they leave their habitation and pupate on the ground (Heath and Emmet, 1983). Therefore, any removal of large stands of the food-plant e.g. by weeding or ride edge management operations, should be avoided if at all possible. The larvae of the White-marked [*Cerastis leucographa*] have never been found in the wild, although they are not difficult to rear in captivity (Porter, 1997). Therefore, it is difficult to make management recommendations on their behalf, other than those that apply generally".

More specifically, the report says: "Invertebrates are susceptible to sudden changes in a well-established habitat, and the pressure on the woodland community will have increased, albeit temporarily, by the disturbance caused by the extensive management that was implemented in all the woods ... However, there is no evidence from this survey that management has been detrimental to the moths in the Milton Keynes woods. Indeed ...it is most likely to have been helpful in preventing decline".

Another point made in the report is: "The detrimental effects of isolation of good quality habitat within an urban setting is an interesting and highly relevant conservation topic. It is well-worth examination in such a survey as this, not least because little hard data has been gathered. Milton Keynes is atypical in terms of layout, having far more open spaces, wider verges, etc. than older towns. Some of this has been managed sensitively (e.g. the R. Ouzel corridor and the ancient woodlands) and the existence of the six survey sites is testimony to that. However, much consists of a highly landscaped mixture of mown grass, plantations with exotic trees and ornamental shrubberies, which have little entomological interest, so the isolation effect is still in operation for the majority of species".

Martin Townsend reflected specifically about potential vulnerability of moths in Howe Park Wood and the need for further data collection to assess this. He said: "*The area around Howe Park Wood is partly urbanised and the evidence presented ... suggests that it may be more vulnerable. The lower alpha and its similarity to that obtained from the smaller, more urbanised sites, might be seen as an indication of deterioration. However, for the reasons outlined, there is no evidence for decline as yet, although this is an interesting result and further data collection would be worthwhile*".

The report concludes with management implications and recommendations:

1. Coppice management, widening of rides and retention of some non-intervention areas are each important for overall habitat and invertebrate diversity and will provide an increased range of food-plants and nectar sources.
2. Coppice rotation in Howe Park Wood appears to have resulted in a good balance between open sunny rides and narrower shaded rides, glades and overgrown areas. Continuation of this management is likely to be beneficial.
3. Woodland edges could be improved, particularly where grass is mown right up to the woodland edge. An uncut margin of up to 5 metres would enable a woodland edge to develop, with uncut grassland and emergent scrub, with a further grassland zone that is cut only in late summer.

4. It is highly desirable to retain as much deadwood of mature and over-mature Aspen as possible, preferably with no trees removed even if they are dying. This would benefit the Notable B species which was present, the Light Orange Underwing *Archiearis notha*, as well as other species reliant on Aspen. The eggs of this species are laid high in the canopy on decaying wood on mature trees, and the larvae pupate in soft, rotten wood.
5. Where Wood Small-reed *Calamogrostis epigejos* is present, this should be managed at times and in ways that benefit the Mere Wainscot *Photedes fluxa*, which was the other Notable B species present in Howe Park Wood. It feeds on the stems of Wood Small-reed and its eggs are laid in a leaf-sheath in July and August. The larvae continue to feed on the plant until the following May when they leave the reed and pupate on the ground. Any removal of large stands of Wood Small-reed, such as by weeding and ride edge management, should be avoided.

**‘A Survey of Butterflies at six selected sites in Milton Keynes 2002-2003’ – Townsend, M (2004) (Ecological Study No. 144)**

Butterfly species were surveyed in 2002 and 2003 at six sites in Milton Keynes including the three ancient woodlands, using transects as the main method. The overall total for these six sites was 26 species. The largest numbers were generally at sites with large expanses of open grassland, or a mix of open and damper, more shaded habitats. Seven of the species were those classified as Nationally Local.

In Howe Park Wood there were 15 UK resident species (compared with 21 at Linford Wood) and two migrant species. The most common was the Speckled Wood *Pararge aegeria*, followed by the Ringlet *Aphantopus hyperantus*. The least abundant resident species found here were: Small Skipper *Thymelicus sylvestris*, and Common Blue *Polyommatus Icarus*.

One conclusion of the study was that the surprisingly low number of butterfly species for a semi-natural ancient woodland probably related to “... the narrowness of many of the rides, extensive cutting resulting in a scarcity of untidy edges and corners in sunny situations and the consequent paucity and discontinuity of nectar sources”.

On the subject of continuity of nectar sources the report suggested that there were rather few flowers in the wood once the brambles have finished. It remarked that “*It is surprising that Hemp Agrimony, an important late summer nectar source in many damp woods, is not present. Introduction of this and also Fleabane ... would be a useful way to improve the situation*”.

The report also discussed the potential for widening rides to create wider areas with ground and scrub flora in sunlight. It also suggested new approaches to frequency of ride-side cutting, such as rotational cuts less frequent than annually, with some areas left and others cut in any one year, possibly with a 1m strip alongside the path cut more frequently. The management regime would divide a ride into sections, to be cut on a sequence of rotations.

The importance of leaving areas of grassy habitat to set seed was stressed and for at least a proportion of such areas to be left standing over winter, including grassy tussocks. This would create the kind of mosaic of habitats that has been demonstrated to be of high value at conservation sites.

Woodland edge was also addressed, with a firm suggestion that cutting to within 1m of the woodland was far too close. The alternative suggested was to seed quite wide areas of such grassland with wildflower seed (of a range of species to provide continuity throughout the season) and to establish rotational cutting to establish tussocky areas and zones of low scrub along the woodland edge. This would produce some of the conditions for the kind of abundance in butterflies experienced along sections of the North Bucks Way.

Of the butterfly species recorded in Linford Wood, 21 were UK resident species and two migrant species. The most common was the Ringlet *Aphantopus hyperantus*, with more than twice the number found than Large Skipper *Ochlodes venata* and Speckled Wood *Pararge aegeria*. The least abundant species found here were: Marbled White *Melanargia galathea*, Small Tortoiseshell *Aglae urticae*, Holly Blue *Celastrina argiolus* and Painted Lady *Vanessa cardui*. One of the conclusions was that “The appearance of a greater variety of species than in the wood, in one relatively small isolated flowery bank outside Linford shows that there is much potential.”

Another conclusion of the study was “that the sites were being managed favourably for butterflies, but their quality could be further enhanced by less intensive and less extensive management of the woodland rides, woodland edges and open grasslands. Here, mowing could be rotational and reduced in selected areas so that more vegetation is left uncut in any given year, in order to increase the size of suitable breeding areas for certain species ...”.

The report discussed the “apparent loss of Wood White *Leptidea sinapis*, Black Hairstreak *Satyrium pruni* and White-letter Hairstreak *Satyrium w-album* from the area, and the scarcity of White Admiral *Limenitis camilla*...” and said “It is concluded that although some habitat is suitable for these species, it is too isolated and may not be large enough for sustainable populations. It appears increasingly unlikely that Black Hairstreak is still present, but it is noted that management is ongoing at Howe Park to encourage it.” Within six years after the study the Black Hairstreak was found again at Howe Park Wood.

The report went on to say: “White Admiral, a more mobile species, could return to the woodland sites, and measures to improve conditions for it are recommended, including a survey for the foodplant to target areas for management.” The foodplant for the White Admiral is Honeysuckle *Lonicera periclymenum* growing in semi-shaded conditions.

The report also said: “It is very unlikely that Wood White is still present, but it is possible that White-letter Hairstreak remains in small numbers, either on sites covered by this survey, or on others in Milton Keynes.”

#### **‘Common Bird Census of Howe Park, Linford and Shenley Woods’ – Middlemarch Environmental (2007) 1987 report (Ecological Study No. 150)**

The 2007 Common Bird Census of the three ancient woodlands in Milton Keynes provided an update of the three previous ones in 1984, 1987 and 1993 and enabled comparisons between them. The method is that of the BTO (British Trust for Ornithology) and uses territory mapping to estimate numbers of each species.

The surveys found less of interest than might be expected for these sizes of semi-ancient woodland. In 1987 the number of bird species breeding in Howe Park Wood was 36 compared with 27 in Linford and 35 in Shenley Wood. Further comparisons were made by the Common Bird Census carried out in 2007. In 2007 the number of breeding species in Howe Park Wood and Shenley Wood had declined to 28, and Linford Wood had risen to 28 and these included:

- two National Biodiversity Action Plan species – Bullfinch *Pyrrhula pyrrhula* and Song Thrush *Turdus philomelos*
- two Red List Species of Conservation Concern – Bullfinch and Song Thrush (but Marsh Tit *Poecile palustris* which had been found there in the 1987 and 1992 surveys was not found in 2007)
- four Amber List Species of Conservation Concern – Dunnock *Prunella modularis*, Goldcrest *Regulus regulus*, Green Woodpecker *Picus viridis* and Stock Dove *Columba oenas*.

The 28 species of breeding bird in Howe Park Wood held 282 territories in 2007, fewer than in 1993 when there were 364 territories. Notable declines over the 14 intervening years were: Chaffinch *Fringilla coelebs*, Coal Tit *Periparus ater*, Dunnock *Prunella modularis*, *Poecile palustris* Marsh Tit; and Starling *Sturnus vulgaris*.

No bird species had significantly increased territories. Over the 20<sup>th</sup> century, in line with national trends, other breeding species have been lost from the three main woodlands in Milton Keynes, The 2007 report noted that “there has been a noticeable decline in the number of breeding species within each of the surveyed woodlands with a loss of the following breeding species” Cuckoo *Cuculus canorus*, Mistle Thrush *Turdus viscivorus*, Spotted Flycatcher *Muscicapa striata*, and Willow Tit *Poecile montanus* (a species that has declined nationally and has increasingly shrunk its distribution northwards, though at least one was hanging on the Hanson Centre woodlands at Stanton Low in 2014) “The loss of all of these species, with the exception of Mistle Thrush, reflects the national picture.”

The 2007 Common Bird Census (CBC) report concluded with eight recommendations:

1. Conduct annual CBC breeding bird surveys to provide information on population trends and relative value of habitats for birds.
2. Continue with the woodland management practices then in place: coppicing, ride enhancement and grassland mowing regimes used at that time.
3. Create more structural diversity by undertaking thinning and coppicing in some of the woodland.
4. Create a 'graded edge' around each woodland area, where possible.
5. Consider planting one or two areas with a wild-bird seed mix to provide winter food for finches, and potentially for buntings which were species with the potential to be attracted to stay and breed. This was recommended for Shenley Wood where there appeared to be the potential on grassland areas outside the Wood and should be possible at Howe Park Wood.
6. Maintain standing and lying deadwood to provide nesting sites and invertebrate prey for birds.
7. Install a selection of bird boxes (including new owl boxes) if these can be monitored and maintained.
8. Update information boards for the public to say which bird species are present.

### APPENDIX 3: SITES OF SPECIAL SCIENTIFIC INTEREST

In 1994 Howe Park Wood was 'notified' by English Nature (now Natural England) as a Site of Special Scientific Interest (SSSI) under Section 28 of the Wildlife and Countryside Act 1981. SSSIs are selected in accordance with criteria and processes set out in 'Guidelines for the Selection of Biological SSSIs' (JNCC 2013): a copy is provided at a) below.

The main JNCC principles for SSSI site selection are the ten 'Ratcliffe Principles' from 'A Nature Conservation Review' (1977) which are: typicalness, fragility, size, diversity, naturalness, rarity, ecological coherence, potential value, and recorded history. The 'Guidelines' document says that "... biological attributes for site selection can be divided into habitat types, individual species of plants, fungi or animals, and species assemblages." (Part 2, Section 4.11, page 13). It also says that it is "... considered important to maintain robust populations of species within SSSIs which can help to support populations occurring in the wider countryside. (Part 2, Section 4.17, page 14); and it addresses the importance of edge habitats: "These overspill or peripheral effects have led to the concept of "buffer land' surrounding an SSSI, over which some degree of management control is required to ensure full protection for an important site. Buffering takes on particular importance for small, isolated sites and linear sites with a large proportion of edge habitat. It involves managing the area surrounding a protected site in ways that reduce adverse effects on the site, and maintain the positive interactions." (Part 2, Section 8.6, page 35).

The entire 21.4 ha (60 acres) of Howe Park Wood was included in the SSSI Notification in 1994, but not the non-woodland edges and parkland surrounding it. The citation describes the Wood and sets out the reasons for its notification: a copy is provided at Appendix b) below with a link to a map of the boundaries. This covers its: history, woodland type as ancient semi-natural woodland, range of vegetation, and moth and butterfly diversity. It lists many of the distinctive plant and animal species and specifically names four moths and four butterflies, including: White Admiral *Limenitis camilla*, Purple Hairstreak *Thecla quercus*, "the nationally scarce" Wood White *Leptidia sinapsis* and the "nationally rare" Black Hairstreak *Satyrion pruni*.

As part of a SSSI notification, Natural England is required to provide a list of operations requiring their consent. A copy of the list of 23 applying to Howe Park Wood is presented at c) below, under the heading 'Operations likely to damage the special interest' (OLDSI). None of the listed operations can be carried out or permitted without Natural England's prior written consent.

Natural England provides a 'Views About Management' (VAM) statement specific to each SSSI. A copy of their VAM for Howe Park Wood is presented at d) below. NE makes clear that these are not a substitute for specific consent for operations listed in OLDSI. The VAM for Howe Park Wood includes, amongst other points, that there should be:

- a range of tree ages and species within and between stands
- some dead and decaying wood, which is essential
- open spaces to benefit invertebrates: temporary gaps after felling of coppicing, and more permanent rides and glades (which may require cutting to keep them open)
- use of felling, thinning or coppicing to create or maintain variations in the structure of the Wood (normally best done end of August to end of February to avoid disturbance to breeding birds)
- successive thinning or coppicing operations which should be spread spatially to avoid too much disturbance in one area, unless open space in adjacent plots is needed to encourage spread of weakly-mobile species
- wet woodland by streams best left undisturbed
- natural regeneration from seed or stump regrowth rather than planting, to help maintain the inherent genetic character of the site.

In the 'Notified Features' appended to the SSSI citation, specific reference is made to "Populations of nationally-scarce butterfly species – *Strymonidia pruni*, Black Hairstreak; but also to: W10 *Quercus robur-Pteridium aquillinum-Rubus fruticosus* woodland; and to W8 *Fraxinus excelsior-Acer campestre-Rubus fruticosus* woodland. W10 and W8 are National Vegetation Classification categories, so inclusion of these as 'Notified Features' makes clear that Howe Park Wood was selected for its overall woodland characteristics and complex of plant and associated species.

- a) 'Guidelines for the Selection of Biological SSSIs' (JNCC 2013)  
[http://jncc.defra.gov.uk/pdf/SSSI\\_GuidelinesPart1\\_PUBLICATION\\_Dec2013.pdf](http://jncc.defra.gov.uk/pdf/SSSI_GuidelinesPart1_PUBLICATION_Dec2013.pdf).
- b) 'SSSI Glossary'  
<http://designatedsites.naturalengland.org.uk/SSSIGlossary.aspx#old>
- c) Natural England Designation of Howe Park Wood as an SSSI, with:
- SSSI Citation of Howe Park Wood
  - List of Operations Requiring Natural England's Consent (LORNEC) at Howe Park Wood
  - Natural England's Views About Management (VAM) for Howe Park Wood
  - Most recent Natural England SSSI Condition Report (CR) for Howe Park Wood  
<http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1006067&SiteName=Howe+Park+Wood&countyCode=3&responsiblePerson>

Natural England SSSI Magic Map showing boundaries of Howe Park Wood SSSI:  
<http://magic.defra.gov.uk/MagicMap.aspx?startTopic=Designations&activelayer=siteunitIndex&query=HYPERLINK%3D%271002701%27>

- d) Natural England (English Nature) document OLDSIS  
'Operations Likely to Damage the Special Interest of a Site'  
<http://www.sssi.naturalengland.org.uk/Special/sssi/old/OLD1006067.pdf>

"As part of a SSSI notification Natural England must provide a list of operations requiring Natural England's consent (in the past this list has been known as operations likely to damage the special interest or potentially damaging operations). None of the listed operations can be carried out or permitted without Natural England's prior written consent or the consent of another public body (provided that the other body has formally consulted Natural England first). This applies where a person wishes to undertake any of these operations themselves or plans to allow others to carry them out."

"It is usually possible to carry out many of these operations in certain ways or at specific times of year, or on certain parts of the SSSI, without damaging the features of interest. Natural England can provide early advice and, where appropriate, issue a consent. In certain circumstances it will not be possible to consent to these operations, because they would damage the features of interest. Where possible Natural England will suggest alternatives which would enable a consent to be issued. To proceed without Natural England's consent may constitute an offence. If consent is refused, or if conditions are attached to it which are unacceptable to the owner or occupier, they may appeal to the Secretary of State for Environment, Food and Rural Affairs."

## **OPERATIONS LIKELY TO DAMAGE THE SPECIAL INTEREST OF A SITE**

Site name: Howe Park Wood  
Ref. No.: O LD1006067

"Type of Operation:

- 2 The introduction of or changes in the grazing regime (including type of stock or intensity or seasonal pattern of grazing and cessation of grazing).
3. Stock feeding, the introduction of stock feeding practice.
5. Application of manure, fertilisers and lime.
6. Application of pesticides, including herbicides (weed-killers).
7. Dumping, spreading or discharge of any materials.
8. Burning.
9. The release into the site of any wild, feral or domestic mammal, reptile, amphibian, bird, fish or invertebrate, or any plant or seed.
10. The killing or removal of any wild mammal, reptile, amphibian, bird, fish or invertebrate, including pest control.
11. The destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, moss, lichen, fungus, leaf-mould and turf.
12. The introduction of or changes in tree or woodland management\*.
- 13a. Drainage (including the use of mole, tile, tunnel or other artificial drains).

- 13b. Modification of the structure of watercourses (e.g. streams, springs, ditches, dykes, drains), including their banks and beds, as by re-alignment, re-grading and dredging.
- 13c. Management of aquatic and bank vegetation for drainage purposes.
- 14. The changing of water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes).
- 15. Infilling of ditches, dykes, drains, ponds, pools, marshes or pits.
- 16a. The introduction of or changes in freshwater fishery production and/or management, including sporting fishing and angling.
- 20. Extraction of minerals, including peat, shingle, sand and gravel, topsoil, sub-soil chalk, lime and spoil.
- 21. Construction, removal or destruction of roads tracks, walls, fences, hard-stands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground.
- 22. Storage of materials.
- 23. Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.
- 26. Use of vehicles or craft likely to damage or disturb features of interest.
- 27. Recreational or other activities likely to damage features of interest.
- 28. The introduction of or changes in game and waterfowl management and hunting practice.

\* Including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.”

- e) Natural England (English Nature) document VAM:  
'Views about Management: a statement of English Nature's views about the management of Howe Park Wood Site of Special Scientific Interest (SSSI).'  
<http://www.sssi.naturalengland.org.uk/Special/sssi/vam/VAM%201006067.pdf>

## **ENGLISH NATURE**

### **Views About Management**

#### **A statement of English Nature's views about the management of Howe Park Wood Site of Special Scientific Interest (SSSI).**

This statement represents English Nature's views about the management of the SSSI for nature conservation. This statement sets out, in principle, our views on how the site's special conservation interest can be conserved and enhanced. English Nature has a duty to notify the owners and occupiers of SSSI of its views about the management of the land.

Not all of the management principles will be equally appropriate to all parts of the SSSI. Also, there may be other management activities, additional to our current views, which can be beneficial to the conservation and enhancement of the features of interest.

The management views set out below do not constitute consent for any operation. English Nature's written consent is still required before carrying out any operation likely to damage the features of special interest (see your SSSI notification papers for a list of these operations). English Nature welcomes consultation with owners, occupiers and users of the SSSI to ensure that the management of this site conserves and enhances the features of interest, and to ensure that all necessary prior consents are obtained.

### **Management Principles**

There may be several different ways in which the wood can be managed to best conserve its value for wildlife - by promoting an appropriate woodland structure, by ensuring regeneration and by looking after the things that make this wood special. The attached notes give broad views on a range of regimes that may be appropriate on your site.

A diverse woodland structure with some open space, some areas of dense understorey, and an overstorey of more mature trees (which may be the standard trees under a coppice-with-

standards regime) is important. A range of ages and species within and between stands is desirable.

Some dead and decaying wood such as fallen logs, old hollow trees or old coppice stools is essential for providing habitats for fungi and dead wood invertebrates. Work may, however, be needed to make safe dangerous trees where they occur in areas of high public access.”

Open spaces, either temporary gaps created by felling or coppicing or more permanent areas such as rides and glades, benefit other groups of invertebrates such as butterflies. They should be of sufficient size to ensure that sunny conditions prevail for most of the day. Rides and glades may require cutting to keep them open. Blackthorn should be maintained along the sunny edges of the woodland and rides to maintain habitat for the black hairstreak butterfly population.

Felling, thinning or coppicing may be used to create or maintain variations in the structure of the wood, and non-native trees and shrubs can be removed at this time. To avoid disturbance to breeding birds the work is normally best done between the beginning of August and the end of February. Work should be avoided when the ground is soft, to prevent disturbing the soil and ground flora. Wet woodland by streams and other waterbodies is often best left undisturbed. Normally, successive felling, thinning or coppicing operations should be spread through the wood to avoid too much disturbance in one area. However, where there is open space interest (e.g. rich butterfly populations) adjacent plots may be worked to encourage the spread of species that are only weakly mobile.

Natural regeneration from seed or stump regrowth (as in coppice) is preferred to planting because it helps maintain the local patterns of species and the inherent genetic character of the site.

Deer management and protection from rabbits or livestock are often necessary. Whilst light or intermittent grazing may increase woodland diversity, heavy browsing can damage the ground flora and prevent successful regeneration.

Where they are a threat to the interest of the wood, invasive introductions such as *Rhododendron ponticum* or Himalayan balsam should, where practical, be controlled.

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Howe Park Wood Views About Management, Countryside and Rights of Way Act 2000, Schedule 11(6) Version date: 12/02/03

- f) Natural England SSSI Condition Report for Howe Park Wood SSSI, September 2010  
<http://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1006067&ReportTitle=HOWE%20PARK%20WOOD>

Condition of SSSI Units for Site HOWE PARK WOOD 28/09/2010

“The woods looked in excellent condition with a lot of active management. The understorey looked in great health, good variety of species and structure. Active scrub management for the black hairstreak butterfly. Management of veteran trees where needed and any young ash / scrub removed to ensure they have enough light and space. Young trees in evidence and little deer/mammal damage seen. Rides are well maintained and mowed with toppings removed. Scrub / shrub belt at the site is also managed and blackthorn coppiced. Overall habitat assessed as in good condition and suitable for supporting the invertebrate interest.”

- g) Natural England document:  
'Sites of Special Scientific Interest: Encouraging positive partnerships'  
[http://adlib.everysite.co.uk/resources/000/076/893/DEFRA\\_SSSI\\_code.pdf](http://adlib.everysite.co.uk/resources/000/076/893/DEFRA_SSSI_code.pdf)

## APPENDIX 4: MILTON KEYNES NATURAL HISTORY SOCIETY AND HOWE PARK WOOD

Milton Keynes Natural History Society carried out studies of Howe Park Wood during the 1970s and 1980s as well as engaging in practical management of some areas of the Wood.

### **Practical site management**

Soon after Milton Keynes was designated as a New Town, members of the Milton Keynes Natural History Society (MKNHS) started to carry out woodland management of Howe Park Wood, largely in Compartment 1. They found it semi-derelict and densely thicketed, mainly with Blackthorn. Over that period of the late 1960s and early 1970s the Development Corporation had no resources to put into woodland management at Howe Park, so they acquiesced to MKNHS carrying out work on this site. MKNHS members cleared old rides and new pathways then began an approximate 12-year coppicing cycle, with glade clearance and some non-intervention areas. Arisings were largely burned on site. The Society's work parties continued to carry out practical coppicing for conservation for over 20 years until the early 1990s, effectively running this part of the Wood as a nature reserve.

The Natural History Society produced two reports about Howe Park Wood:

- 'Milton Keynes Natural History Society Proposals for the Forestry and Recreational Management of Howe Park Wood in the New City of Milton Keynes' (1976) by Mike Towns
- 'Milton Keynes Natural History Society Management Plan and Proposed Work Programme (1986-1993) for Howe Park Wood' (1986) by W G R (Bob) Stott.

### **Wildlife studies and monitoring**

Members of the Natural History Society carried out extensive surveys and monitoring of wildlife at Howe Park Wood and elsewhere in Milton Keynes, covering flora, birds, mammals, invertebrates, and other groups. Some bird-ringing was done and comprehensive breeding bird surveys.

A Rothamsted light trap for moths and other invertebrates was installed by one of the Society, John Wickham. This was one of a national network run as part of the National Insect Survey which had been set up in 1964 by Rothamsted Experimental Station (established in Hertfordshire in 1843 and now known as Rothamsted Research). The National Insect Survey has operated for over 50 years and is still running in 2015. Each trap is run by volunteers who collect specimens from the trap each day, identify all those moths they recognise then send all the specimens to Rothamsted for recording on their database of species and trends. John Wickham operated the trap daily for several years in the early 1970s until other commitments prevented him from continuing. No data was kept in Milton Keynes, but it is thought that Rothamsted will have continued to hold the data.

Some of the Natural History Society's other studies are described in the following articles in the Society's Journal:

*The Milton Keynes Natural History Society Journal: No1 1975 (pp 1-5)*  
'The Breeding Birds of Howe Park Wood: 1970 to 1974' by N Scarfe

The Natural History Society decided in 1970 to carry out a "comprehensive survey of the woodland to evaluate and monitor any changes in flora and fauna which may occur as urbanisation proceeds around it". For their study of birds they decided to use the British Trust for Ornithology's Common Bird Census (CBC) methodology and carried this out for each of the five years from 1970 to 1974.

[Subsequently, Milton Keynes Development Corporation commissioned two more Common Bird Census studies in: 1983/1984 and 1987, and The Parks Trust commissioned a further two in 1993 and 2007; so there has been a sequence of nine CBC studies of Howe Park Wood spanning 45 years.]

The most notable aspects of these CBC studies from the 1970s are differences from studies in later decades. In particular:

- The presence of two pairs of Nightingales *Luscinia megarhyncha* in 1979 and 1972, but not in 1973 or 1974.

- Grasshopper warblers *Locustella naevia* in 1972 and 1973 (but not in 1971 or 1974) close to the stream at the woodland edge.
- Spotted flycatcher *Muscicapa striata* recorded as present in three of the five years and a nest in 1973.
- Successful breeding by Tawny Owls *Strix aluco* with young seen out of the nest in three of the five CBC study years. A nest-box was erected for them in 1972 and first used in 1974.

The journal article also refers to an earlier management regime when the Wood had been used for the rearing of Pheasant.

*The Milton Keynes Natural History Society Journal: No1 1975 (pp 5-12)*  
'The Plants of Howe Park Wood' by Roy Maycock

John Kelcey the Milton Keynes Development Corporation's ecologist had carried out a 'Vegetation Survey in Howe Park Wood' in 1974.

Roy Maycock's article is based on a survey of all of the wood in the years prior to his summary report in 1975. It provides a brief summary of the probable history of Howe Park Wood, a summary of its soil and hydrology and an explanation of coppicing which had recommenced recently. He described the ground flora as "very rich in species, the rides and open areas providing the greatest variety". His report mentions a single Greater Butterfly-orchid *Platanthera chlorantha* close to "an extremely rare hybrid grass ..." which had been found by John Kelcey and that the identity of this hybrid of *Glyceria fluitans* x *G. declinata* was confirmed to its finder by Dr C E Hubbard [Hubbard was the author of the standard identification book 'Grasses: A Guide to their structure, identification, uses and distribution in the British isles, 1954, which has been updated and remained in print until now. Hubbard was in charge of the grasses section at Kew Gardens].

A diagrammatic map is included of the distribution of types of tree, coppice and main ground flora. The main substance of the report is a list of species found, under the headings: algae, fungi, bryophytes, ferns, woody plants and herbaceous plants.

*The Milton Keynes Natural History Society Journal: No1 1975 (pp 12-17)*  
'Records of Mammal Population, Distribution & Activity in Howe Park Wood: 1969-1974'  
by Bernard Frewin

Bernard Frewin's report is of a detailed mammal survey of Howe Park Wood over two years from October 1969 to October 1971, which included small mammal trapping. The main purpose was to identify which species were present, but it mentions that more detailed studies of particular species had taken place since this initial study which would be published at a later date.

- No Hedgehogs *Erinaceus europaeus* were found in the wood although suitable food was left for them.
- Mole *Talpa europea* earths were found in the wood; in wetter periods these were only in the higher areas.
- Common Shrew *Sorex araneus* were found wherever traps were laid in the wood.
- Pygmy Shrew *Sorex minutus* were not found to be common. Those that were found were mainly in dense grass by the ditches at the edges of the wood.
- Water Shrew *Neomys fodiens (bicolor)*: one was caught in the stream area.
- Bats were seen but not studied.
  
- No Fox *Vulpes vulpes* earths were found but there were signs of their presence in the wood.
- One Stoat *Mustela erminea* was seen in a Squirrel dray.
- There had been several records of Weasel *Mustela nivalis* in the wood and one was trapped.
- Badgers *Meles meles* were infrequent visitors to the wood, though there was an old Badger sett which was known to have been active in 1968 but not since then.
- Evidence of the occasional presence of Muntjac Deer *Muntiacus reevesi* was found and one sighting.

- Throughout 1970 droppings of two Hares *Lepus europaeus* were found within the wood and twelve Hares were found in the field south of the wood. In October 1970 two Hares were found “torn to pieces” after the hunt had visited, but there was evidence that other Hares had visited the wood after that.
- Rabbits *Orytolagus cuniculus* were found particularly in areas bordering the stream and their burrows and pellets were found within the wood. It was noticed that numbers within the wood were lower when corn in neighbouring fields gained height and that numbers in the wood increased after harvest. Numbers also fluctuated in relation to myxomatosis.
- A preliminary survey of Grey Squirrel *Sciurus carolinensis* was in progress, to be reported subsequently.
- One nest of a Harvest Mouse *Micromys minutus* was found within the south side of the wood and two more were found close to the wood.
- Wood Mouse *Apodemus sylvaticus* were found wherever traps were laid in the wood. More were found than any other mammal.
- One House Mouse *Mus musculus* was found on the edge of the wood, close to a farmhouse.
- No Brown Rats *Rattus norvegicus* were trapped in the wood, nor evidence of them, though rat holes and droppings were found outside the wood, by a pond close to St Giles church, and eight were trapped around the farm buildings during and after harvest.
- Many Bank Voles *Clethrionomys glareolus* were trapped, though numbers were inverse to the number of Wood Mice during individual years.
- No Short-tailed Vole *Microtus agrestis* were caught inside the wood, though two were trapped in the hedgerow bordering a field south of the wood.

It should be noted that the detailed survey data was not included with the Journal report.

The conclusion of the study was that Howe Park “exhibits the typical mammal population to be found in any isolated woodland. If a survey of this type can be carried out again after the wood has been opened to the public, it will be interesting to see how the existing mammal population is affected”. It was also suggested that “The existing population could be adversely affected if it were cut off from the surrounding countryside and there would, therefore, need to be a wide corridor leading from the wood to the new city boundary to avoid this”.

*The Milton Keynes Natural History Society Journal: Volume 5 1991 (pp 3-30)*  
‘Management & Diversity: A Study of the Ground Flora in Howe Park Wood’  
by Linda Murphy

Linda Murphy set out to study Compartment 1 of Howe Park Wood to:

- a) assess the trends in diversity of ground flora in relation to management regimes applied;
- b) compare species diversity within areas subjected to different management regimes, especially the effects of coppicing over time;
- c) assess the effects of management regimes on the distribution and abundance of individual species and groups of species.

Fieldwork was carried out in 1988, covering quadrats of 6mx2m at 20 representative sites. Ground flora species and percentage were recorded. Additional survey work was done at smaller quadrats at nine sites on four further visits. The density of trees and shrubs was recorded as were factors such as bare soil and deadwood. 84 species of ground flora were recorded, which are listed in the Journal article. Statistical formulae were applied to the data to assess diversity and this enabled comparisons of different parts of Compartment 1 relating to factors such as: time of year, weather, light and canopy closure, nutrient levels, moisture, particular management regimes, number of years since coppicing, and level of human disturbance. The Society was recommended to maintain its current management practices, but to give some consideration to the sizes of coppice compartments and glades with respect to shading. Linda Murphy is still an active member of MKNHS in 2015.

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