Silverback Arboricultural Consultancy

CHILL WOOD MANAGEMENT PLAN

Site Address:
Chill Wood
Iron Acton
South Gloucestershire

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Contents

Instruction

We have been instructed by Iron Acton Parish Council to compile a woodland survey and report to inform the creation of a 5 year management plan for Chill Wood, Iron Acton.

The woodland survey will address the current condition of the woodland, highlighting any major health and safety hazards or potential issues which could threaten the long term health and longevity of the woodland.

Based on the initial survey, the management plan will contain recommendations to enhance the woodland, improve public access and enjoyment, and measures to secure long term succession of the woodland.

The survey is based on ground level assessment of the trees. Except where stated, all dimensions are estimated. An arboricultural consultant visited the site on Tuesday 5th January 2021. The weather was mild with good visibility.

Scope of Survey

The intention of the survey was to:

1. Identify existing species within the woodland including upper canopy trees, understorey trees and shrubs, and ground cover plants.
2. To make an assessment of the general health of the woodland
3. To make recommendations to ensure the continued biodiversity of the woodland.

Legal Duty

1. It is the responsibility of the tree owner to ensure that their tree(s) is in a safe and stable condition, including the effects of root activity, through duty of care in the Occupiers Liability Act (1957 & 1984).
2. The Wildlife and Countryside Act, 1981 makes it an offence to disturb a nesting bird or recklessly endanger a bat or its roost. Professional advice should be sought, where relevant, before undertaking any recommended works.
    - 2.1. The bird nesting season varies considerable but officially recognised as February – August. If works are intended during this period a site survey, of the proposed works area, should be undertaken prior to commencement. If nesting birds are located works will need to be postponed.
    - 2.2. It is considered that the general clearance of invasive species proposed should not impact on any bats within the woodland. However, it is considered that the dangerous trees and branches, proposed for removal adjacent to the footpaths, could potentially contain bat roasts. As previously discussed, it is recommended that a qualified Tree Surgery Contractor is employed to undertake these works. They will be able to assess the potential presence of bats and act accordingly.
3. Chill Wood is covered by a Woodland Preservation Order. Woodland Preservation Orders protects young trees, as well as the existing mature specimens. Subsequently the existing Woodland Order will continue to protect all the trees as the woodland naturally

regenerates or additional planting is undertaken to enhance the woods.

4. Prior to commencement of any management works written consent will be required from South Gloucestershire Council for the proposed tree works.

Chill Wood

Overview

Chill Wood is a designated area of Ancient Semi Natural Woodland situated to the south of the village of Iron Acton, South Gloucestershire, at grid reference ST 67899 82940. It is a mixed species broadleaf wood, predominately Oak and Beech, and covers an area of approximately 3.1 acres.

It is designated as a Site of Nature Conservation Interest (SNCI) by South Gloucestershire Council with the view to maintain and conserve the biodiversity of local flora and fauna in accordance with the UK's Local Biodiversity Action Plan.
The woodland is owned by Iron Acton Parish Council to allow access for parishioners and the general public. Although there are no public footpaths through the woodland, there are a number of Permissive Paths which allow general public to use and enjoy the woodland. These can be accessed at the southern and north east edge of the woods.

Site Details

The woodland is situated on a small hill which slopes downwards towards the edges and is surrounded on all sides with open fields mainly used for grazing or hay production. To the north is the old quarry railway track travelling east- west. To the south the River Frome runs east-west before turning northwards just past the woodland. The old mill race spurs off, from the river, and flanks the western boundary of the woodland before diverting westward towards the Old Mill on Frampton End Lane.

Immediately south of the woodland is a detention reservoir, known as Tubbs Bottom, that prevents flooding of the River Frome and connects to the Frome Valley Walkway. The south eastern side of the woods is flanked by a stream that flows into the River Frome at the south.

The woodland contains a small cave on the southern boundary and has evidence of historic iron ore mining throughout. Most of the worked ground is on the southern edge of the woodland and waste piles are still evident from the shallow surface pits which was the method of mining used at the time in the area. It sits on a bedrock of sandstone which protrudes from the ground in a craggy fashion as further evidence of historic mining.

The map of Chill Wood as seen on the next page shows a height of 60m above sea level, the highest point being roughly in the middle of the woodland. The woods is roughly rectangular in shape with each end sloping upwards towards the middle. The steepest section of the woods is on the southern side where stone steps are cut into the slope for easy access up the hill with a more gentle gradient on the north side.

Map showing Chill Wood, Iron Acton and the surrounding area in relation to the information given above.

Survey Information

A previous survey of the woodland was carried out in October 2014 with the intention to identify the existing species in the woods; assess the general health of the woodland and; to propose plans to ensure the continued preservation of the woodland and its biodiversity.

A site survey was undertaken twice in January 2021 as part of continued management scheme for the site. The use of the DAFOR Scale was implemented to record the relative abundance and cover of tree species in the woods, wherein: D = Dominant; A = Abundant; F = Frequent; O = Occasional and; R = Rare. The table for this can be seen in Table 1 below. Difficulties arose from the survey being taken in January and trees species had to be identified primarily from leaf litter on the ground, tree bark, and where possible, from buds. It is recommended that a further, more thorough investigation be conducted in spring or summer to supplement this survey. Furthermore, it is recommended to take quadrat samples to assess the floral biodiversity in the woodland ground and field layer to provide a picture of the woodlands' overall health, ecological productivity and lateral diversity.

The most abundant tree species appeared to be Oak, Neech and holly. A full list of tree species found during this initial survey can be seen in Table 1 along with their relative abundance.

Tree Species	Latin Name	DAFOR Rating	Cover
Oak	*Quercus spp.*	D	51-100%
Holly	*Ilex spp.*	D	51-100%
Beech	*Corylus avellana*	A	31-50%
Ash	*Fraxinus excelsior*	F	16-30%
Hazel	*Corylus avellana*	O	6-15%
Cherry	*Prunus spp.*	O	6-15%
Elm	*Ulmus spp.*	R	1-5%
Hawthorn	*Crataegus monogyna*	R	1-5%
Field Maple	*Acer campestre*	R	1-5%
Wild Service	*Sorbus torminalis*	R	1-5%
Blackthorn	*Prunus spinosa*	R	1-5%
Elder	*Sambuca nigra*	R	1-5%
Larch	*Larix decidua*	R	1-5%
Sweet Chestnut	*Castanaea sativa*	R	1-5%

Table 1 shows the relative abundance of the tree species in Chill Wood using the DAFOR Scale.

Oak and Beech are the most common trees that form the upper canopy of the woodland. Ash is also frequent throughout the woodland, particularly on the eastern edge of the woods and contains the Ash Dieback disease.
The understorey is predominately Holly throughout the main body of the woods. Due to its evergreen habit Holly out-competes other shrubs and smaller trees, shading them out and preventing their establishment. Around the woodland edges, where there is less Holly, Hazel, Elder, English & Wych Elm, Hawthorn and Blackthorn can be found.
The Holly and the presence of extensive ground ivy, aided by the excessive shading of the woodland floor by the Holly, have restricted the ground cover plants to the woodland edges. This has reduced the biodiversity of the woodland and may have impacted on the varieties of animals and birds living in the woods. Even on the woodland edges the understorey is sparse with a lack of woodland shrubs and smaller tree. Holly is gradually establishing itself in these areas.
Areas of Holly could be cleared to allow the planting of suitable native species to increase the biodiversity and species mix of the woodland. There are a large number of fallen trees within the woods which have been left in situ. This has some ecological value, however it is considered that the amount of 'random' fallen trees on the woodland floor could also have a detrimental impact on some woodland ground species.

There were also a number of standing deadwood and veteran trees identified during the survey which is a good indicator of a healthy woodland. The standing deadwood trees are located mainly in the middle of the woodland. The veteran trees were situated on the woodland edges. It is recommended that only minimal management is undertaken such as reducing large deadwood within the veteran trees to remove any overhang of the footpaths.

Analysis

An analysis of the above information will be laid out here with the view to form objectives on the proposed management of Chill Wood.

Ancient Woodlands

An Ancient Woodland is a woodland that has persisted in England since 1600 which includes species that are considered threatened and that do not exist elsewhere. They hold great ecological importance and are the richest and most complex terrestrial habitats in the UK. As it takes hundreds of years to form and develop it is not possible to replace or replicate this environment in any other form. It provides an environment for species that are slow to establish and colonise and which are vital players in the ecosystem, such as lichen and bryophytes. Less than only 2.5% of UK land contains Ancient Woodland indicating its ecological, environmental and historical importance. Ancient Woodlands can be identified by species known as Ancient Woodland Indicators, which include species such as bluebells (*Hyacinthoides non-scripta), W*ood Anenome (*Anemone nemorosa*), Wild Garlic (*Allium ursinum*), Lungwort Lichen (*Lobaria spp.),* Hart's tongue fern (*Asplenium scolopendrium*) and, Wild Service tree (*Sorbus torminalis)* all of which can be found Chil Wood.
As an Ancient Semi Natural Woodland, Chill Wood has developed naturally and has continuous tree cover for hundreds of years while being in use by humans. In the case of Chill Wood, the human use has been for iron ore mining, with some trees (mostly oak) being felled to aid this process. In recent times humans use the woods for recreational purposes.

Site of Nature Conservation Interest

A SNCI is a designation used by local authorities for areas with substantive natural and or geological value. It does not have statutory protection and is down to the local governing authority to protect, conserve and manage. SNCI's are selected based on their habitats or inherent wildlife interest to support threatened or rare species within it. They make a vital contribution to delivering the UK and Local Biodivesity Action Plan and the Geodiversity Action Plan, as well as maintaining local natural character and distinctiveness.
Biodiversity Action Plans are aimed to protect and conserve threatened species and habitats, as well as implement targets and strategies to restore them. They are also known and Priority Habitats as there is a great need to retain these habitats and species on a local, national and global scale.

Biodiversity

The importance of Ancient Woodlands and biodiversity in general cannot be overstated. Biodiversity is the variability among plant and animal species and their interactions in a given area that contribute towards a healthy ecosystem. The roles and traits that different species contribute to ecosystem functioning, stability and productivity have many direct and indirect benefits essential for human survival. Many works assign values to biodiversity, such as whether biodiversity has intrinsic or extrinsic value. The intrinsic value of species is a non-anthropocentric view where a moral obligation to protect species relates to their implicit worth for just being alive

and a part of life. This also applies in the sense that biodiversity contributes to the way nature works and therefore it has a right to exist.
On the other hand, the extrinsic value of biodiversity refers to its use or efficiency for human consumption. Extrinsic values can also be described in terms of economic, scientific, aesthetic, recreational, and spiritual value, and these values mean different things to different people. This is important to consider in terms of conservation as decisions are based on what people value.
The economic value of biodiversity lies in products such as food and medicine. Over 90% of the calories consumed worldwide originate from 80 plant species. Plants are also used as medicine by an estimated 4.5 billion people. One example includes aspirin which is derived from meadowsweet (*Filipendula ulmaria)*, which is present in Chill Wood. Other products obtained directly from biodiversity includes shelter, timber, fuel such as firewood and coal, and fibres such as wool and cotton. All these products that are gained through biodiversity is used on a daily basis and many meet our fundamental needs as humans.
Biodiversity also has scientific value, for instance when it comes to the products and services provided by species, and perhaps more so when it comes to biomimetics and bionics. This where natural systems or elements that have refined over time through natural selection are mimicked to solve complex human problems. One example of these include Velcro, inspired by the hooks on burr plants.
The aesthetic value of biodiversity can have both extrinsic and intrinsic meaning to people; where the aesthetic value of certain species not only provides people with pleasure, it is also associated with their actual value as beautiful beings. Furthermore, species that are considered to be aesthetically pleasing or charismatic are often used as strategies for conservation organisations. For example, the panda used by WWF.
Biodiversity creates a wealth of recreational activities for humans, from snorkelling in coral reefs to caving deep underground to gardening. The recreational value of biodiversity is also related to its aesthetic value in that these activities generally take place in aesthetic environments. The recreational value that biodiversity provides is hugely important for the health and wellbeing of people, particularly where obesity and depression is a growing crisis. Moreover, many recreational activities that can promote health and wellbeing can be completely free and doesn't always require a lot of time, for example, a walk in the local woods.
The spiritual value of biodiversity is evident across many cultures worldwide and throughout time. Ancient and modern civilisations have worshipped various animal deities and practices surrounding this have become part of their cultural identity. One element of this is the concept of biophilia. The biophilia hypothesis involves our inherent and subconscious need as humans to connect with nature and other life forms as it is a part of our evolutionary heritage.
The whole idea of valuing biodiversity shows its great importance for humans through what it can provide to different people with different needs, on top of the most basic needs it can fulfil such as food, shelter and water. The values outlined here all have to an extent some kind of economic value, however there are other more crucial services biodiversity provides on which it is difficult to place any economic value and therefore often go overlooked.
These services are actually invaluable as nearly all life on Earth is dependent on these things for survival. The roles of plants and animals are essential for processes such as: carbon, hydrogen and nutrient cycling; soil renewal through decomposers; atmosphere and climate regulation through plants producing oxygen as waste product absorbing and sequestering carbon dioxide which helps to control weather patterns; pollination and seed dispersal which are critical for productivity and food production; its use in flood defence and water purification; and finally, in the control of pollution, pests and disease. Biodiversity can be considered a human survival kit, providing us with everything we need to live healthy, contented lives.

Deadwood and Old Trees

Old and dying trees, along with standing and fallen deadwood provide habitats and or food source for almost a thousand species. Most of these are insects and invertebrates, and also include avian species such as bats and hole nesting birds. Deadwood is also vital for species such as lichen, mosses and fungi which can be slow to establish but are major contributors to a healthy, diverse woodland. These habitats are particularly important for many rare and restricted species. Invertebrates are crucial components of food webs and fulfil many ecosystems services, such as pollination, decomposition and nutrient release. They have a complex life cycle which requires a range of conditions during each stage of their life cycle. Around a third of invertebrates depend on deadwood for a suitable habitat.

Many categories of deadwood exist; this variability supports different types of species and it is therefore important to keep all types of deadwood as a habitat for different types of wildlife. A natural woodland ecosystem would feature many types of deadwood including dead branches within living tree canopies, standing and fallen dead trees, veteran trees and old stumps. Forestry Commission research has shown that, in general, larger pieces of deadwood (10 cm or more in diameter) have more micro-habitats and support more species than smaller pieces. However, this does not imply that deadwood less than 10 cm diameter has no habitat value – small-dimension deadwood is normally present in most woodland without active management intervention.

Deadwood also plays a part in mitigating the effects of climate change by acting as a medium-term sink for carbon. Dead and decaying trees are vital components of a properly functioning woodland ecosystem and play a key role in sustaining biodiversity and soil fertility.

During the survey it was noted that some of the deadwood were marked for removal. It is recommended to retain these trees due to their high ecological value. Instances where these trees should either be kept or removed are shown in Figures 1 and 2 on the following pages.

Figure 1: The above pictures show individual dead trees which are marked for removal. These trees are far away from any footpath and is therefore unlikely to pose any health and safety risk to public. It is highly recommended that these trees are retained for their ecological value within the woodland.

Figure 2: The picture to the left shows where deadwood poses a potential threat to public safety. Unlike in Figure 3, this individual is near a footpath, and in fact can be seen leaning against another tree. The footpath can be seen below the tree in the background. It is currently being supported by another tree from falling over the footpath showing it to be a risk. In this case it may be reasonable to remove this instance of deadwood from the woodland since it clearly poses a risk to public safety.

Ash Dieback

“For as long as possible, where safe to do so, retain ash trees. Favour prime, unstressed specimens, but consider that even moderately tolerant trees may have something to offer genetically to the future. Keep as many female (seed producing) trees as possible.” Quote from Natural England.

Ash Dieback (*Hymenoscyphus fraxineus*) is a chronic fungal disease which affects all types of ash trees resulting in the decline and possible death of over 90% of the two billion Ash trees in the United Kingdom, according to The Tree Council. It is characterised by leaf loss and dieback in the canopy. The disease affects the vascular system of the tree inhibiting its ability to draw nutrients and water up to its canopy and upper branches. The fungal spores are dispersed by wind and therefore it is very difficult to prevent the spread of the disease.

A tree with Ash Dieback can be identified mainly by its leaves. Early defoliage, browning of leaves, misshapen or contorted leaves and wilting in the summer are all signs of Ash Dieback. It can also be seen in the stem and bark where lesions, spots and cankers may appear.

The issues caused by Ash dieback not only contribute to the major decline of the vast majority of our ash trees, but also has significant impacts on production of timber, maintenance of water resources, the provision of habitat for other species and biodiversity.

The Tree Council has compiled an Ash Dieback Action Plan Toolkit to aid local authorities in managing the impacts of Ash Dieback. The link for this Toolkit is provided at the end of this section. The Action Plan lays out the following steps to combatting the effects of Ash Dieback:

1. Raising awareness: Understanding what Ash Dieback is and its potential affects to the local area to people, businesses and the environment will help in putting together a plan in managing its implications.
2. Assessing the scale of impact: Identifying which trees in a population has Ash Dieback is an important step in mitigating the disease. Collecting data on the number and distribution of ash trees in Chill Wood and surrounding areas will help to identify which trees are a risk to public safety.
3. Case for Ash Dieback Action Plan: There are many considerations to take into account when managing Ash Dieback. The health and safety, economic, reputational and environmental impacts of the disease should be weighed up before any works take place. Proactive management will be a more cost effective approach than reactive management with fewer implications.

Ash Dieback is a relatively new disease and the effects are yet to become clear. Little is currently understood about the disease and it is not yet known whether some ash trees may become resilient to the disease and or will recover after becoming affected. It is important to retain ash trees where possible (and where public safety is not a factor) in order to better understand how and why some ash trees may recover. This will undoubtedly have positive implications for future generations of ash trees if the genetic material of individual species can be used to allow future ash trees to not become susceptible to the disease.

Ash trees are an important species in our woodlands due to the 'open' structure of their leaves which allows light through the canopy to the ground floor. This can increase the amount of ground flora in woodlands and support a wider variety of plants than in a woodland made up mostly of beech where foliage is denser and therefore lets in relatively little light.

https://treecouncil.org.uk/wp-content/uploads/2019/11/Tree-Council-Ash-Dieback-Toolkit-2.0.pdf

Ash Dieback in Chill Wood

There are a number of Ash trees in Chill Wood, all of which are suspected to have the Ash Dieback disease. The vast majority of Ash trees are located in the north east edge of the woodland. Currently all the Ash are marked up for removal with the view to reducing the spread of the disease and to minimise the threat of falling trees for public safety.

It is recommended to categorise Ash trees into different Health Classes (as seen below) to assess the trees' current state of health and for future surveys. Any subsequent surveys should then be used to monitor changes between Health Classes over time. This will allow a greater understanding of the spread and speed of impact of Ash Dieback. Monitoring over time is also essential as reports show that in some years trees may recover canopy condition, especially during hot and dry summers when the weather is not ideal for fungal sporulation. This method can make the response to dealing with Ash Dieback more cost effective as some trees may not require immediate action and can be reasonably left to be monitored for any potential future action.

Ash Health Class 1 – 100%–76% remaining canopy
Ash Health Class 2 – 75%–51% remaining canopy
Ash Health Class 3 – 50%–26% remaining canopy
Ash Health Class 4 – 25%–0% remaining canopy

Public safety should be a priority when managing Ash Dieback in Chill Wood as it is used frequently by visitors. However, where Ash trees do not pose a significant risk to public safety, such as where Ash trees are not near a footpath, it is proposed that some trees are retained. Retaining some of the Ash trees has many potential benefits and include:

1. Future scientific knowledge of understanding Ash Dieback: It is possible that some of the trees currently infected may overcome the disease and survive. This would hold great value in understanding how Ash trees can overcome the disease and its genetic material can be reproduced for future generations that may be immune to Ash Dieback. While there is a small chance of this, removing all of the trees will discard any ability to understanding the disease further.
2. Ash trees contribute to biodiversity: As previously stated, the structure of Ash leaves allows more light to ground surface, which in turn allows more flora to emerge at ground level. Having different types of habitats within the woodland, I.e shaded areas and lighter areas, encourages a more diverse range of fauna and floral species in the woodlands contributing to a better overall health and productivity of the woodland. Furthermore, many species depend entirely on Ash trees
3. Deadwood: It is likely that most of the Ash trees affected with Ash Dieback will eventually die and fall over. Where this is not a risk to public safety it is recommended to keep this natural process as much as possible within the woodland. Deadwood has very high ecological value especially for invertebrates and small insects. These species have specific niches within an ecological system than many larger species depend and rely on. Deadwood plays a key role in sustaining biodiversity and soil fertility and is an essential asset within a healthy woodland.

4. More cost effective: Removing fewer trees will reduce the costs associated with felling trees, requiring less works and resources.

The next pages show some pictures of the Ash trees marked in Chill Wood (Figure 3 and Figure 4). It is proposed and recommended that not all of these trees are removed.

Figure 3: The picture on the left shows three sh trees that have been marked for removal. It can be clearly seen that these trees are beside a footpath regularly used by public. In this case it is recommended that these trees be removed for the health and safety of public visitors.

The removal of the Ash in this area (adjacent to footpaths) may also have benefits other than that of public safety. Removing the Ash trees along the path may also contribute to the development of rides with are important microhabitats within woodland. Rides are open areas in a woodland, usually for access, which add diversity to the lateral structure in the woods. By creating areas that have a gradient from the ground layer, field layer, shrub layer and canopy layer can encourage more diversity among plants and animals and is especially important for species like butterflies and moths.

It is difficult, however, to create an effective ride and glade within a small woodland such as Chill Wood and these also require ongoing management every few years to maintain them. Removing the Ash trees along the path may create a natural ride within the woods by opening up areas in the woods where plants at the lower levels in the woodlands' lateral structure can develop.

It is also important to ensure that creating rides and glades in small woodlands does not create habitat fragmentation by splitting one part of the woodland from another. By ensuring there is some natural corridor left, i.e. the woodland is still connected and intact, will prevent habitat fragmentation.

Figure 4: The picture above shows a number of Ash trees marked for removal. The footpath used by visitors is at the bottom of the picture. It is clear here that many of the ash trees in the background do not pose a significant risk to public safety given their proximity to the footpath. The marked ash trees in the foreground of the picture pose a higher risk than those further away from the path. It is therefore considered that the trees within a closer proximity to the path can be removed. It is further recommended that the Ash trees far away from the path be retained despite the presence of Ash Dieback.

Objectives

From the above analysis, the following objectives were formed:

1. To maintain the site as a broadleaved woodland – this can involve caring for existing trees and planting new trees and native species in the woodland.
2. To enhance the wildlife value of the woodland – ensuring the continued succession and biodiversity within the woodland. This can involve introducing new native species to create a more diverse ecosystem without the threat of non native species taking over. Also, by ensuring there is a variety of different habitats within the woodland, such as in deadwood, rides, open and shaded areas, and by creating diversity among the lateral structure of the woodland.
3. To improve the recreational value of the woodland – allowing the continued enjoyment and safety for the public in the woodland by keeping access permissible, and removing and mitigating potential threats. Interpretation boards can be added to the site entrances to inform public on the local flora and fauna, Ash Dieback disease, and historic use of the woodland. Creating awareness can engage visitors and may encourage a healthier, safer attitude when spending time in the woodland.
4. To maintain the landscape value of the woodland – removing or felling trees only when absolutely necessary to keep the landscape and historic value of the woodland.
5. To involve local people in the care and management of the woodland – local peoples may have a more vested interest in keeping the woodland in a good condition given its long term association with the village. This can involve contributing to keep it clear from litter, as well as helping to identify and monitor potential issues within the woodland, such as with Ash Dieback disease.

Recommendations

The following proposals and recommendations have been formed from the objectives stated above and from the analysis of the woodland surveys undertaken in October 2014 and January 2021.

1. It is recommended that Ash trees are removed only where they pose a risk to public health and safety. In doing so will also create a ride within the woodland, creating another type of habitat and adding to the diversity of its lateral structure and biological organisms.

2. It is recommended that some Holly be removed from the understorey to allow more light into the lower levels of the woodland, thereby allowing a wider variety of vegetation to establish.

3. It is recommended to retain as much standing deadwood as possible, where this does not pose a risk to public health and safety. If the dead trees are close to public access area they should be monolithed rather than removed.

    3.1 The height of the retained stem will be determined by the structural integrity and the tree surgeons ability to safely reduce the tree to the recommended height. It is considered that a 4m monolith would not pose a

significant threat to people using the woodland but would retain a standing dead/ decaying tree for the ecological value it offers.

3.2 Where the tree can be retained as a higher stem, such as 8m it is considered desirable, it is also accepted that some tree may be in such a condition where it is unsafe to attempt to climb the tree and will need to be felled closer to the ground. In these cases it is recommended that the stump is retained as high as possible.

3.3 Rough, jagged cuts are to be encouraged when removing limbs or attaining the final stem height. Coronet cuts could be used to increase the rate of decay within the stem or branch union.

4. It is recommended to include some interpretation boards at the entrances to the woodland. This can increase the safety of the public by showing permitted footpaths.

4.1 Interpretations boards can also improve the recreational value of the woodland by educating and engaging visitors with the local flora and fauna and history associated with Chill Wood.

4.2 Informing visitors of Ash Dieback disease and raising awareness of it will also increase the safety of visitors. It is suggested by The Tree Council that visitors should wash their boots before and after visiting areas with Ash Dieback disease as this may have an affect on limited the spread of the fungal spores that cause the disease. Informing the public of the impacts of Ash Dieback is, at minimum, a responsible approach to responding to the disease.

5. It is recommended to plant other native tree species within the woods to maintain the site as broadleaf woodland, and to increase and enhance biodiversity. It will also contribute towards replacing the trees lost to Ash Dieback. Suggestions for which species to plant include:

5.1 Wild Service trees are rare native species in the UK and an Ancient Woodland indicator. Although there is already at least one Wild Service tree within Chill Wood, planting more of these species will help to bolster the local and national Wild Service tree population. They are often found within oak and ash woodlands suggesting that Chill Wood has suitable soil conditions for Wild Service trees to establish and thrive.

5.2 Small-leaved Lime trees are also a rare native species in the UK and another Ancient Woodland indicator. Due to their rarity, it is suggested to plant small-leaved Limes to bolster local and national populations. Furthermore, Small-leaved Lime trees are also very attractive to bees which is incredibly important for pollination and floral reproduction.

5.3 Rowan trees are a native tree species to the UK. They also look similar to ash trees and may be a good option for replacing the trees lost to Ash Dieback in the woodland due to their similar appearance. Furthermore, they generally do not

grow to a large height and can add some diversity to the lateral structure of the woodland and understorey. The berries also attract many bird species.

5.4 Other species to include for planting in understorey and ground/field layer can be as follows: Guelder rose (*Viburnum opulus*); Wayfaring Tree (*Viburnum lantana*); Spindle (*Euonymus europaeus*); Bluebells (*Hyacinthoides non-scriptus*); Snowdrops (*Galanthus nivalis*); Anemones (*Anemone nivalis / blanda*); Foxgloves (*Digitalis purpurea*); Primroses (*Primula vulgaris*), and Violet (*Viola spp.*).

Program of Works

The proposed five year program of works is detailed in Appendix 1 of this report. These recommendations are intended as a guide and can be altered at any stage.

For management purposes it is proposed to divide the woodland into 4 sections along the main two footpaths, as indicated on the proposed area division plan (Appendix 2). This will enable the works to be undertaken on different sections over a number of years. Subsequently, the impact of the works will be reduced since areas of wild woodland will still be available during the works. New planting will be of various ages throughout the woods. Different stages of coppice rotation within various areas of the woods will create a range of habitats.

Works to improve access to the woodland, which should be undertaken prior to the commencement of any other works, are listed below.
Prior to the commencement of any management works it is recommended that the existing two main footpaths are improved for public access and to facilitate management works.

Works to Improve Main Footpaths

Remove dangerous trees and potentially dangerous branches overhanging or adjacent to the main footpaths.

All works will be undertaken in accordance with BS3998:2010 Tree Work Recommendations. It is recommended a suitably qualified and experienced Tree Surgery contractor should be employed to undertake this work.
These two paths will also be used by small vehicles to clear debris from ongoing management works within the woods. Erect interpretation boards at either end of woodland

Prior to any works it is recommended that a site notice is erected informing the general public of proposed dates for the works. During the work, the area should be closed to public access and taped off with hazard tape and clear signage.

Interpretation Boards are recommended to improve public safety and enjoyment of the woods, and could contain information such as permitted footpaths, wildlife, Ash Dieback disease, and importance of biodiversity.

Appendix 1: Five Year Works Program

Chill Wood, Iron Acton

	Year 1	Year 2	Year 3	Year 4	Year 5
Footpaths	Establish interpretation boards at woodland entrances	Cut back any overhanging branches from footpath. Spread new woodchip to maintain footpaths	No works	Cut back any overhanging branches from footpath. Spread new woodchip to maintain footpaths	No works
Area 1 (Green)	No works	Plant wildflowers	Inspect new planting. Remove 80% of holly	Cut back any new vegetation encroaching on new planting	Cut back any new vegetation encroaching on new planting. Re-coppice hazel stools
Area 2 (Purple)	Remove ash in Class 1 and 2	Remove ash in Class 1 and 2. Remove brambles	Plant new trees and wildflowers	Inspect new planting, check guards, replace damaged or dead plants	Cut back any new vegetation encroaching on new planting, Check new trees as previous year
Area 3 (Orange)	No works	No works	Remove 80% of holly. Remove brambles	Plant new trees and wildflowers	Inspect new planting, check guards, replace damaged or dead plants
Area 4 (Brown)	Remove 80% of holly, particularly from woodland edges	No works	No works	No works	No works

Area Works

Area 1 contains some deadwood which should be retained. Some Holly has previously been removed from this area and should be followed up in year 3 as an ongoing process. Wildflowers can be planted where the Holly is less overbearing and should be checked each year to determine their success or failure.

Area 2 is the location of the Ash trees, some of which require attention and works. Ash trees that are considered to be in Health Classes 1 and 2 (where there is a maximum of 50% tree canopy foliage remaining) that year should be removed. Removing the Ash from close proximity of any footpaths will improve the safety of public and also create a ride within the woodland. Remove brambles to ensure a cleared area for the ground and field layer to establish within the ride. This creates a lateral structure and diversity in this area. Where Ash has been removed, new planting should be added to supplement the trees in the area. See the list of recommended species provided in this report for new planting.

Area 3 contains some deadwood which should be retained. After the Holly has been removed, particularly from the woodland edges, new trees and wildflowers can be planted when understorey is less overbearing and more light is permitted to the ground floor. These should be checked and maintained often to ensure their success.

It is has been suggested in this survey to remove 80% of the Holly from Area 4, particularly from the woodland edges where the Holly is more prevalent. Subsequent to this, it is recommended to then leave this area for the remaining years to assess the woodlands ability to regenerate and to see what species will naturally establish to the new conditions provided by the removal of the Holly. This can then build a picture of the woodlands overall health and productivity without intervention from human activity.

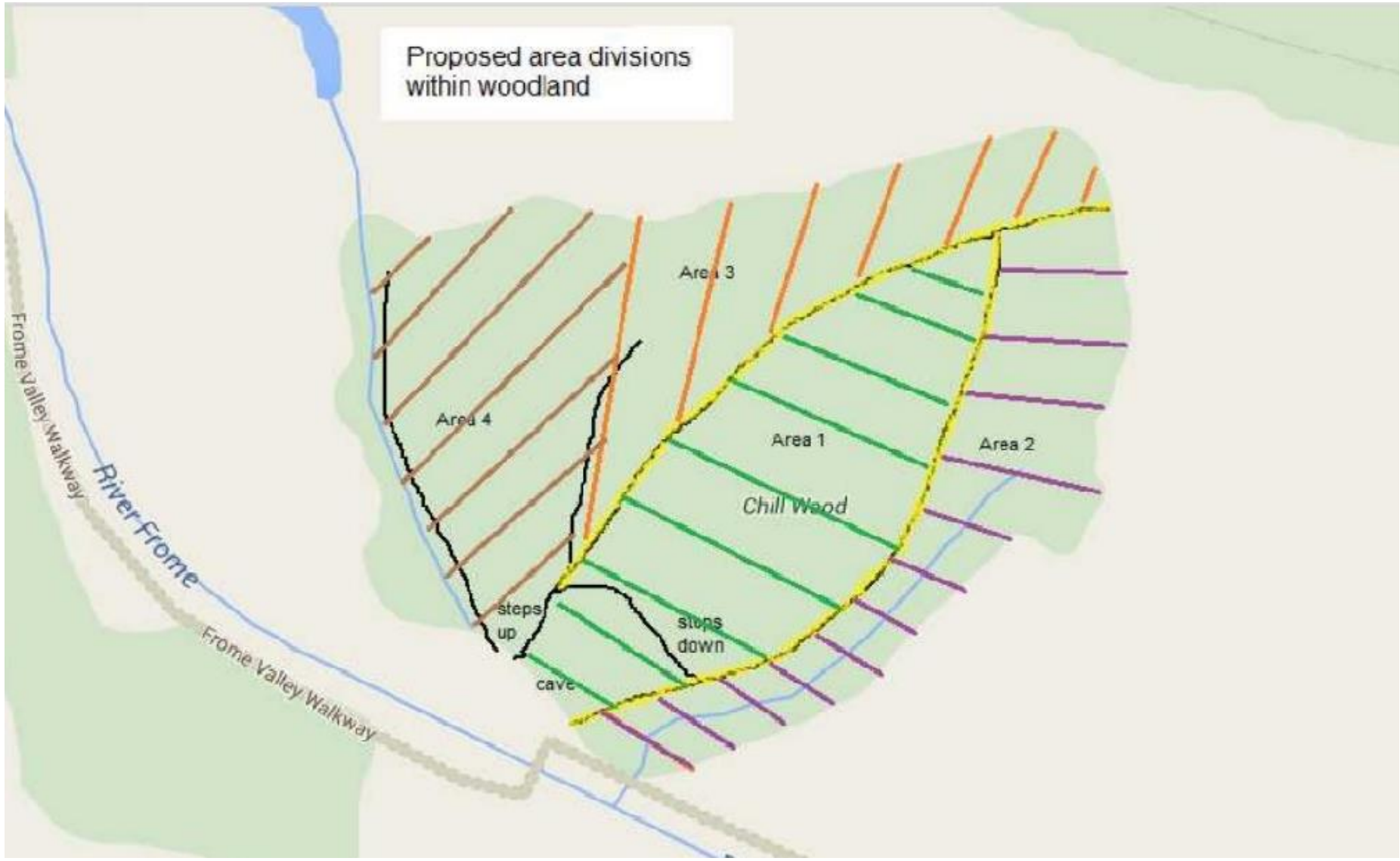
Aftercare and Maintenance

Aftercare is crucial to the success of tree planting schemes. It had been estimated that one half of trees fail after the tenth year, often as the result of neglect. Weeding the area around the trees, particularly during the Spring will reduce the impact of competition from weeds on the newly planted trees' water, nutrients and soil quality. Therefore, any removal of weeds around the trees should be done early in the year.

A 1m weed-free area should be maintained around trees planted for five or more years. The use of chemical control is discouraged as this can negatively affect other wildlife within the woods. Mulching and or hand weeding is overall a better alternative for the environment, although more labour and cost intensive.

Appendix 2: Site Plan

Site Plan showing area divisions and main footpaths for Five Year Works Program



Summary

Chill Wood is an Ancient Semi Natural Woodland that requires management to ensure its succession and longevity for now and future generations. Understanding the importance of biodiversity to humans and the environment on a local, national, and international level will contribute towards creating and sustaining a healthy, productive woodland. Increasing and maintaining the biodiversity at the micro and macro level within the woods is essential to achieving this goal.
Implementing the recommendations provided in this report will help to encourage more wildlife in the woodland and will provide a safer, more enjoyable experience for humans and wildlife, alike.