




**Copse Hill House, Copse Hill, Lower Slaughter,
Gloucestershire GL54 2HZ**

**Phase 1 Habitat Survey
& Protected Species Assessment**

February 2022

on behalf of Mr & Mrs Caulkin

Client	Mr & Mrs Caulkin
Job name	Copse Hill House, Copse Hill, Lower Slaughter, Gloucestershire GL54 2HZ
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1 Introduction

1.1 Site Description

Copse Hill House is a detached dwelling located on Copse Hill, within the open countryside near the village of Lower Slaughter in Gloucestershire GL54 2HZ. The approximate Ordnance Survey grid reference for the dwelling is SP 1644 2342. The dwelling dates from the latter part of the 19th Century and is set within grounds that include formal gardens, shrubberies, areas of hard-standing, parkland and woodland.

The focus of this report is an area within the grounds, to the south of the house, where there is a proposal to create a lake. The approximate Ordnance Survey grid reference for this area is SP 1649 2332 (see Appendix 2). The area comprises part of a field of improved grassland, currently grazed by sheep. In addition, other habitats around the house, including terraces to the south and east, are also included within the study.

In addition to the area of the proposed lake, this report also covers an attached, single-storey garage building to the north side of the dwelling, as well as a detached outbuilding, pool building and swimming pool located to the north-west of the dwelling (see Appendix 2), across an area of hard-standing that is used for access and car parking.

The property is located within the open countryside and is set within grounds of grassland and woodland, with trees and woodland to the western and northern sides of the dwelling. These habitats lead into hedgerows, tree lines and woodland within the wider countryside. Surrounding habitats appear to be very suitable for both foraging and roosting bats.

1.2 Background

A suite of bat surveys was undertaken at Copse Hill House in 2021, focussing on the dwelling. These surveys confirmed the presence of a maternity colony of serotine bats *Eptesicus serotinus* within an upper loft space of the house, a maternity colony of brown long-eared bats *Plecotus auritus* within the main loft space, as well as day roosts of common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *P. pygmaeus* in other locations including under roof tiles and within stonework.

No evidence of roosting bats was ever found within the single-storey attached garage or within the outbuilding or pool building during the surveys in 2021.

1.3 Aims of Study

The aims of this study are to describe and evaluate the habitats present within the areas that are the focus of this study (proposed lake, terraces, swimming pool, attached garage, pool building and outbuilding) and to assess the potential for these areas/habitats to support protected and notable species. The report discusses the likely impacts of development on the ecology of the site, on valued habitats and on protected/notable species. The study also makes recommendations for appropriate mitigation measures and habitat enhancement with regard to habitats and species. The need for further ecological survey work is discussed in light of the impact assessment.

Another aim of this study is to survey the outbuilding and pool building for bats and/or evidence of bats and to assess the overall potential of the buildings to support roosting bats. The report discusses the likely impacts of the proposed works (including a loft conversion to the main loft space, renovation and repair to the entire roof) on bats and makes recommendations for appropriate mitigation, compensation and enhancement measures in this regard.

The potential impacts are assessed in accordance with the legal protection afforded to bats under The Conservation of Habitats & Species Regulations 2017. The need for a European Protected Species (bat) Mitigation Licence is also discussed in light of the impact assessment.

1.4 Bat Ecology

Bats are the only mammals to have developed the ability of true flight. At present, over 1,100 species of bat are recognised worldwide, making bats the second largest mammal group after rodents. As well as flight, bats have evolved a system of navigation and orientation using echolocation which has allowed many species to become nocturnal. There are 18 species of bat that occur within the British Isles, of which 17 are known to breed here. More species occur in the south and west of the country, with species numbers declining towards the north and into Scotland.

All bat species in the UK are nocturnal and feed exclusively on insects (they are insectivorous) which they catch in flight during their night-time activity, using echolocation to locate and home-in on their prey. Bats will roost during the daytime and seek out dark, enclosed and undisturbed places in which to do so, often using a variety of roosting sites within their home range. Different roost sites are used for different purposes (such as mating, giving birth and hibernation) and at different periods of a bat's life cycle.

During the summer, female bats will gather together in a maternity or breeding roost. In the UK, this starts to occur towards the end of May and the females will seek out a warm and undisturbed site in which to give birth. Because maternity roosts require a particular set of environmental attributes (such as location, temperature, orientation and size), breeding bats tend to return to roost and breed in the same locations year after year. Given that bats live a relatively long time (anywhere from 10-20 years), and only give birth to one pup a year, maternity colonies are crucial to the reproduction and survival of the local population and can be very sensitive to environmental change.

Relatively little is known about hibernation roosts, as tracking and locating hibernating bats is very difficult. However, many species (particularly those within the genera *Myotis* and *Rhinolophus*) have been found within underground sites such as caves, mines and cellars, where the temperature remains constant and low throughout the winter allowing the bats to remain in a state of torpor. The spring and autumn are periods of transition and bats can use a number of different locations on a temporary basis, often moving between roosts as environmental conditions change and temperatures fluctuate. In the autumn, bats will mate and it has been shown that male and female bats will gather at particular locations (such as a building, cave or tree) to meet, socialise and mate.

Bats choose to roost in a number of different locations, depending on the species, their activity pattern and the period of their lifecycle. Certain species, such as the pipistrelles, favour crevices and small cavities for roosting and will use features such as cracks, crevices and small rot holes in the boughs and trunks of trees and within certain features of buildings such as boxed eaves, gaps under roof tiles, hanging tiles and soffit boards. Other species favour large, uncluttered roof spaces and lofts within buildings where they can hang up on the underside of the roof and use the interior space for flying prior to emergence. Hollow trees, cellars, caves, barns, churches and cavity walls can also all be used for roosting, given suitable access. Certain species, such as the noctule, favour roosting sites within trees whilst others tend to favour buildings. Roost sites may be used by only a very small number of bats, such as solitary males, or may offer shelter to tens or hundreds of bats within maternity and hibernation roost sites.

The suitability of roosting sites is also highly influenced by the location or context of a tree, building or cave. Roost sites are most often favoured when they are within close proximity to foraging habitats and where those habitats are connected to one another within the landscape by features such as hedgerows, woodlands, rivers or sunken lanes along which bats disperse and 'commute' from place to place. Suitable foraging habitats are any places where insect prey is diverse and abundant such as woodlands, ponds, lakes, rivers, scrub, hedgerows and unimproved grassland or pasture. Thus, the ecological context of a site is very important for determining if bats may be present within a roost and the potential for a roost to be present tends to be much higher within rural or village locations.

2 Methodology

2.1 Extended Phase 1 Habitat Survey

An Extended Phase 1 Habitat Survey was undertaken on 31st January 2022 by Jan-Piet Stuursma on behalf of Windrush Ecology. A walkover of the site was conducted, and a description of the habitats present was prepared using standard Phase 1 Habitat Survey methodology (JNCC 2010).

Target notes were also prepared on features of particular ecological interest and an assessment was made of the site's potential to support protected and notable species (such as species listed under Section 41 of the NERC Act 2006).

The survey areas included the site of the proposed new lake, as well as the attached garage, pool building and outbuilding, as well as the swimming pool, patio and terraces around the house.

2.2 Initial Bat Survey & Preliminary Roost Assessment

2.2.1 Personnel

An initial bat survey and preliminary roost assessment was undertaken on the 31st January 2022 by Jan-Piet Stuursma. The survey covered the attached garage, the outbuilding and pool building, and did not include the dwelling of Copse Hill House.

Mr Stuursma holds a licence from Natural England to survey for bats within all counties of England (Natural England Bat Survey Licence No. WLM-A34 Level 2: 2018-37063-CLS-CLS).

2.2.2 Survey Method

A detailed internal and external survey of the buildings (attached garage, outbuilding and pool building) was undertaken using a 1 million candle-power torch and close-focusing binoculars in order to look for bats and/or evidence of bats and to assess the potential of the buildings to support roosting bats. The internal and external elevations of the buildings were inspected for evidence of bats including, bat droppings, urine stains, feeding remains (such as moth wings) and characteristic fur staining around access points.

Notes were made on the relative freshness, shape and size of bat droppings and the location and quantity of any feeding remains. 'Clean' gaps and crevices within the structure of the buildings were looked for as this can indicate where bats may have gained access to the interior spaces and the fabric of the walls.

The bat survey was undertaken according to best practice guidelines published by the Bat Conservation Trust (Collins 2016).

The study also takes into account the structure and ecological context of the buildings, including the following factors which may increase the likelihood of roosting bats being present:

- Age of the building (pre-20th Century or early 20th Century construction)
- Nature of construction; traditional brick, stone or timber construction
- Large and complicated roof void with unobstructed flying spaces
- Large (>20 cm) roof timbers with mortice/tenon joints, cracks and holes
- Entrances and gaps for bats to fly and crawl through
- Poorly maintained fabric providing ready access points for bats into roofs, walls; but at the same time not being too draughty and cool.
- Roof warmed by the sun, south-facing roofs in particular
- Weatherboarding and/or hanging tiles with gaps
- Undisturbed roof voids
- Buildings and built structures in proximity to each other providing a variety of roosting opportunities throughout the year

Buildings or built structures close to good foraging habitat, in particular mature trees, parkland, woodland or wetland, especially in a rural setting.

The criteria within Table 1 are used for as guidelines for assessing the potential suitability of buildings for bats (Collins 2016).

Table 1. Criteria for the assessment of bat roost potential of buildings (Collins 2016).

Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after the presence is confirmed).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitats.

In addition to the bat survey, the buildings were checked for evidence of nesting birds including old birds' nests, bird droppings, feathers and eggs. There was a focus on looking for evidence of barn owls, including barn owl feathers, droppings and pellets.

3 Results & Evaluation

3.1 Ecological Context

Copse Hill House dates from the latter part of the 19th Century and is a detached dwelling within the open countryside close to the village of Lower Slaughter.

The house is surrounded by landscaped grounds, which includes trees and woodland to the west and north. These areas of woodland link into hedgerows and tree-lined lanes within the wider landscape, and in turn into other areas of woodland.

The landscape is considered to be highly suitable for bats, with hedgerows and tree lines offer habitat connectivity and woodland offering potential foraging and roosting habitats. The buildings of local villages, many of which are of traditional stone construction, also offer potential roosting opportunities.

3.2 Habitats

Please refer to Appendix 1 for photographs. Location plans can be found within Appendix 2.

3.2.1 Buildings

Attached Garage

Attached to the northern side of the dwelling is a single-storey garage with four open bays to its western side. The building is of stone construction, with a flat roof of concrete held by a metal frame and stone columns. There are no loft spaces and the whole of the building is open to its western side. The flat roof has a covering of mineral roofing felt.

The attached garage is in a good state of repair, with solid external and internal stonework. The building is assessed as having 'negligible' potential (Collins, 2016) to offer shelter to bats.

Outbuilding

To the north-west of the dwelling is a detached outbuilding of stone construction, with a pitched roof of slate tiles. The outbuilding is considered to date from the latter part of the 20th Century and serves as a workshop and store. There are no separate or enclosed loft spaces within the outbuilding and the pitched-roofed section is completely open to the underside of the roof, and illuminated by three skylights. The roof has a modern underlay and is supported by a metal and timber frame. There is an attached glasshouse to the western side of the building.

The outbuilding is in a good state of repair, with solid external stonework and intact roof tiles. The roof has a modern underlay and there are no loft spaces or other enclosed spaces that bats could use for shelter. The slate tiles of the roof are close-fitting. The outbuilding is assessed as having 'negligible' potential (Collins, 2016) to offer shelter to bats.

Pool Building

The pool building is attached to the south-eastern corner of the outbuilding and is of stone construction, with a sloping roof of slate tiles. There are no separate or enclosed loft spaces, and the room is illuminated by three small windows and a glazed door to the western elevation, and a glazed door to the eastern elevation.

The outbuilding is in a good state of repair, with solid external stonework and intact roof tiles. The pool building is assessed as having 'negligible' potential (Collins, 2016) to offer shelter to bats.

3.2.2 Improved Grassland

The field to the south of the dwelling, where there is a proposal to create a lake, comprises an area of agriculturally improved grassland, currently used for the grazing of sheep. Grasses dominate and include false oat grass *Arrhenatherum elatius* and cock's-foot *Dactylis glomerata*, with very low abundance of herbs such as creeping buttercup *Ranunculus repens*, dandelion *Taraxacum officinale* and white clover *Trifolium repens*.

The grassland is species-poor and does not meet the criteria of a grassland habitat of 'principal importance' as listed within Section 41 of the NERC Act 2006. The habitat is typical of agriculturally improved grassland within lowland England and (in isolation) is considered to be of low ecological value.

The improved grassland comprises part of the grounds of Copse Hill House, which is listed as 'wood pasture and parkland' (see Figure 1), a habitat of 'principal importance' as listed within Section 41 of the NERC Act 2006. As such, the grassland is considered to form part of a habitat that is of local ecological value.

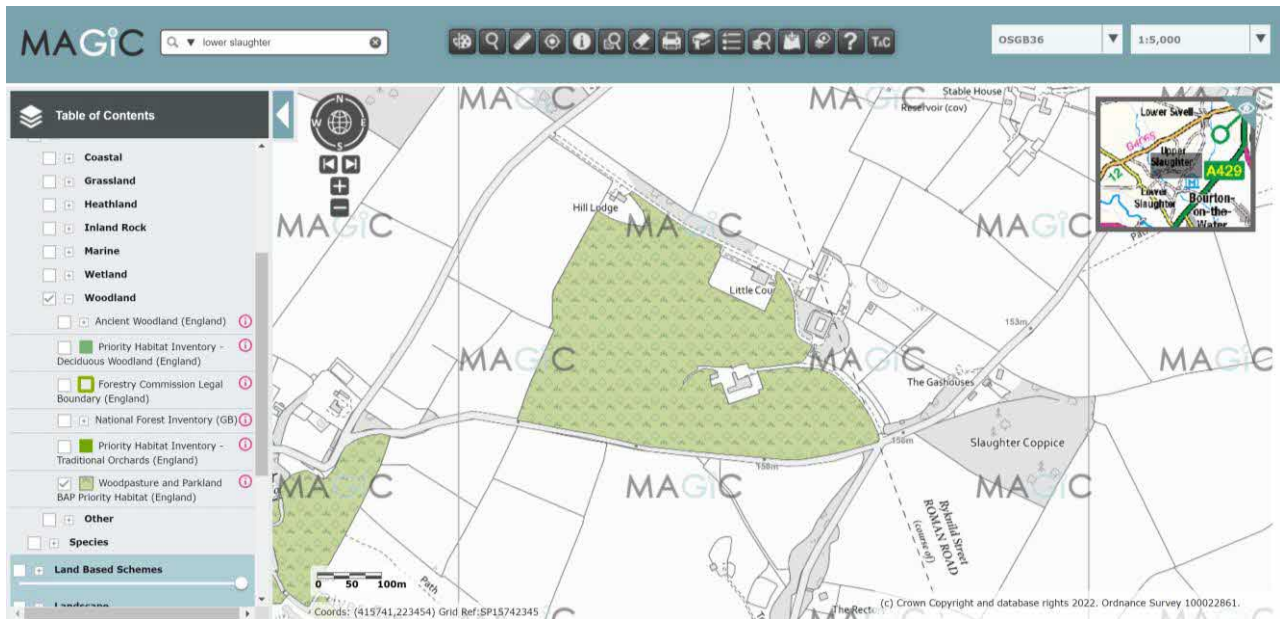


Figure 1. Map obtained through the Multi-Agency Geographic Information Centre (MAGIC) website, with the extent of wood pasture and parkland habitats indicated in green.

3.2.3 Hedge/Tree Line

Along the southern side of the proposed lake, and forming the southern boundary of the landholding at Copse Hill House, is a tall hedge/tree line along the adjacent road. Native trees and shrubs within this boundary include oak *Quercus robur*, ash, *Fraxinus excelsior*, beech *Fagus sylvatica*, horse chestnut *Aesculus hippocastanum* and sweet chestnut *Castanea sativa*.

Alongside the road is a row of Leyland cypress *Cupressus x leylandii*, forming a hedge, which is a non-native conifer species that is often planted for screening.

3.2.4 Gardens/Terraces

To the west, south and east sides of the dwelling are existing lawns and terraces. The lawns (amenity grassland) are close-mown and well-maintained. The sward is dominated by grasses, with herbs including dandelion, creeping buttercup, white clover and daisy *Bellis perennis*.

The grassland is species-poor and does not meet the criteria of a grassland habitat of 'principal importance' as listed within Section 41 of the NERC Act 2006. The habitat is typical of amenity grassland and is considered to be of low ecological value.

Associated with the terraces are flowerbeds (bare ground), ornamental shrub planting, and a beech hedge (to the eastern side of the eastern terrace). There is also ornamental shrub planting to the north and east of the attached garage. To the south-west and south of the swimming pool are shrub beds with ornamental holly *Ilex aquifolium*, cherry laurel *Prunus laurocerasus*, conifers, and *Skimmia japonica*.

These habitats form part of the formal gardens and landscaping of the house and are considered to be of low ecological value. The shrubs are trimmed to shape, and are largely non-native, ornamental varieties.

3.2.5 Other Habitats

Other habitats in close proximity to the proposed areas of redevelopment are hard-standing to the north and north-west sides of the dwelling, and surrounding the swimming pool (patio).

To the west of the outbuilding and swimming pool is a kitchen garden of vegetable beds and other cultivated land.

Areas of hard-standing and cultivated land are considered to be of negligible/low ecological value.

3.3 Species

3.3.1 Bats

No bats, or evidence of bats, were found within the attached garage, outbuilding or pool building. All three buildings have been assessed as having 'negligible' potential to offer shelter to roosting bats.

3.3.2 Birds

No evidence of birds was found in association with the attached garage, outbuilding and pool building and the three buildings are not considered to be suitable for barn owls *Tyto alba*, or other species of conservation concern.

Trees, shrubs and hedges of the gardens and grounds may offer nesting opportunities to breeding birds, and some of the large and taller trees may be suitable for species such as the red kite *Milvus milvus*.

Improved grassland, amenity grassland, bare ground and hard-standing do not offer suitable habitat to ground-nesting species, such as the skylark *Alauda arvensis*.

3.3.3 Reptiles

The areas of improved grassland and amenity grassland (lawns) are not suitable habitats for reptiles. The improved grassland is species-poor and has a uniform, homogeneous structure, and is not considered to offer suitable shelter to common reptiles such as the slow worm *Anguis fragilis*.

Amenity grassland is close-mown and regularly maintained, and does not offer any suitable habitat or shelter to reptiles. Similarly, areas of bare ground (flowerbeds, cultivate ground) and hard-standing, do not offer any suitable habitat to reptiles.

3.3.4 Amphibians

There are no ponds, as shown on Ordnance Survey maps, within a 250m radius of the proposed areas of redevelopment, and the proposed lake.

The nearest two ponds are located approximately 265m to the north-east of the proposed redevelopment of the attached garage and approximately 280m from the proposed lake. It is considered unlikely that amphibians will be dispersing to the site, including areas of improved grassland, in order to seek shelter whilst on land.

3.3.5 Other Species

No evidence of other protected or notable species, such as badgers *Meles meles*, was noted during the surveys.

The parkland, grounds and gardens of Copse Hill House may offer some habitat to hedgehogs *Erinaceus europaeus*, although areas of hard-standing and bare ground do not offer suitable shelter or habitat.

4 Discussion

4.1 Relevant Legislation & Policy Guidance

4.1.1 Bats

As with many animal species within the UK, declines in the abundance and distribution of many bat species have been documented through recent decades. The reasons for these declines are various and complex but it is considered that the major factors are changes in landuse and agriculture, the loss of woodlands and hedgerows and the loss of suitable roosting sites.

Bats are particularly sensitive to human activity due to the fact that they roost within buildings, trees and underground structures such as mines, and the availability of suitable roost sites is considered to be a key factor in the conservation of bats within the UK. As a consequence, all species of bat and their roost sites are protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) and under The Conservation of Habitats and Species Regulations 2017. Taken together, these make it an offence to:

- (a) Deliberately capture or intentionally take a bat
- (b) Deliberately or intentionally kill or injure a bat
- (c) To be in possession or control of any live or dead wild bat or any part of, or anything derived from a wild bat
- (d) Damage or destroy a breeding site or resting place of such an animal or intentionally or recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection
- (e) Intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection
- (f) Deliberately disturb any bat, in particular any disturbance which is likely
 - to impair their ability;
 - (i) to survive, breed, reproduce or to rear or nurture their young; or
 - (ii) in the case of hibernating or migratory species, to hibernate or migrate; or
 - to affect significantly the local distribution or abundance of the species to which they belong

A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.

Although the law provides strict protection to bats, it also allows this protection to be set aside (derogation) under The Conservation of Habitats and Species Regulations 2017 through the issuing of licences (referred to as European Protected Species Licences or EPSL). Where a lawful operation is required to be carried out, but which is likely to result in one of the above offences, a licence may be obtained from Natural England (the statutory body in England with responsibility for nature conservation) to allow the operation to proceed. However, in accordance with the requirements of The Conservation of Habitats and Species Regulations 2017, a licence can only be issued where the following requirements are satisfied:

- The proposal is necessary 'to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment';
- 'There is no satisfactory alternative';
- The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.

These three criteria are often referred to as the 'three tests' of the Regulations. All three must be satisfied in order for a licence to be granted.

4.1.2 *Nesting Birds*

Nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. The nesting season for most species is between March and August inclusive.

Certain birds, including the red kite, are listed on Schedule 1 of the Act, which provides protection from disturbance whilst on the nest and whilst preparing to nest.

4.1.3 *The Natural Environment and Rural Communities Act 2006*

Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 places a duty on the Secretary of State to publish, review and revise lists of living organisms and types of habitat in England that are of principal importance for the purpose of conserving English biodiversity.

It also requires the Secretary of State to take, and promote the taking of, steps to further the conservation of the listed organisms and habitats. This is important in the context of planning decisions as the National Planning Policy Framework affords planning policy protection to the habitats of species listed by virtue of Section 41.

Habitats listed within Section 41 of the NERC Act 2006 that are considered relevant to the site include:

Parkland

Species listed within Section 41 of the NERC Act 2006 that are relevant to the site, or considered to be potentially relevant, include:

Bird species, such as dunnock and song thrush (hedgerows, trees, parkland, woodland and shrubberies offer potential habitat)

Hedgehog

4.1.4 *National Planning Policy Framework (NPPF)*

The revised National Planning Policy Framework was updated in July 2021 and sets out the government's planning policies for England and how these are expected to be applied. This revised Framework replaces the previous National Planning Policy Framework published in March 2012, and revised in July 2018.

The NPPF states that planning policies and decisions should contribute to and enhance the natural and local environment by:

Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

Maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.

Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:

- The need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
- The cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and
- Any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.

To protect and enhance biodiversity and geodiversity, plans should:

- Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

When determining planning applications, local planning authorities should apply the following principles:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons, and a suitable compensation strategy exists; and
- Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

The following should be given the same protection as habitats sites:

- Potential Special Protection Areas and possible Special Areas of Conservation;
- Listed or proposed Ramsar sites; and

Sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitat's site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitat site.

4.2 Impact Assessment

4.2.1 Habitats

There are no foreseeable adverse impacts on valued habitats. Improved grassland, amenity grassland and ornamental planting are considered to be of low ecological value, and other habitats that will be affected, such as bare ground and hard-standing, are of negligible ecological value.

Whilst the improved grassland forms part of a parkland habitat (of principal importance), the proposed lake will not result in an adverse impact on this habitat type. Indeed, it is considered that the lake will enhance the value of the parkland habitat and of the grounds of Copse Hill House in general. The lake will create a standing water habitat that does not currently exist, and will provide potential habitat for breeding birds, aquatic plants, aquatic invertebrates and amphibians.

The proposed redevelopment of the garage, outbuilding and pool building will result in no foreseeable adverse impacts, as the proposals will only affect existing buildings, areas of hard-standing and bare ground that are of negligible ecological value.

The proposed changes to the gardens and terraces to the south and east of the house will only affect existing lawns (amenity grassland), improved grassland and some ornamental shrubs, and will result in no foreseeable ecological impacts.

It is understood that the proposals also include the creation of species-rich, 'wildflower' grassland within areas to the north of the dwelling, and to the north-east of the proposal lake. It is considered that these proposals will also result in an ecological enhancement, as these areas of grassland are currently species-poor and dominated by common grasses. It is considered that the proposed lake, and proposed wildflower areas, will complement and enhance the existing parkland habitats.

It is also understood that the proposals include the removal of Leyland cypresses from the southern boundary of the site, and the replacement of these trees/hedge with native species. Leyland cypress is a non-native species that is considered to be of little value to wildlife. Removal and replacement of these trees would be seen as a significant ecological enhancement.

4.2.2 Species

Bats

The surveys indicate that roosting bats are absent from the buildings that are the focus of this study. There is no evidence to indicate that the buildings are being used as a place of shelter/protection by roosting bats. The proposed redevelopment works are unlikely to result in any significant impacts on bats or the places that they use for breeding, shelter and/or protection (roosts) and no specific compensation measures are considered necessary (Mitchell-Jones 2004).

The proposals will have no foreseeable direct or indirect impacts on the known bat roosts that are within Copse Hill House itself. Whilst the new extension will connect to the northern side of the dwelling, this will not affect the roofs or loft spaces, or any known bat roost locations within the stonework of the dwelling.

Since no significant impacts on bats are predicted under The Conservation of Habitats and Species Regulations 2017, a European Protected Species (bat) licence will not be required for the proposed

works to proceed. Since there are no predicted impacts on bats or their habitats, it is not necessary to consider the 'three tests' of The Conservation of Habitats and Species Regulations 2017 in this instance.

Birds

There are no foreseeable impacts on nesting birds within buildings. Removal of woody vegetation, including ornamental shrubs and Leyland cypresses, during the bird breeding period has the potential to result in the damage or destruction of active birds' nests, and the killing/injury of young. There are no foreseeable impacts on birds that may be using tall trees for nesting, as the proposals will not involve the removal of tall/mature trees.

Other Species

There are no foreseeable adverse impacts on other protected or notable species, including amphibians, reptiles and badgers.

Whilst the proposals will result in the loss of some improved grassland, flowerbeds and shrubberies, it is not considered that this will result in a significant loss of habitat for hedgehogs. Extensive areas of improved grassland and parkland, as well as garden, will remain and will be available to small mammal species such as the hedgehog.

As discussed previously, the proposed creation of a lake is likely to result in a significant ecological enhancement for species, particularly aquatic species for which there are no existing standing water habitats. The lake is also likely to provide enhancement for other species such as birds, reptiles and bats, by providing potential foraging habitat and/or shelter.

5 Recommendations

5.1 Habitats

5.1.1 Native Planting

It is recommended that new native planting, to replace non-native species such as Leyland cypress, includes local species, and species typical of hedgerow habitats such as:

Hawthorn *Crataegus monogyna*
Blackthorn *Prunus spinosa*
Spindle *Euonymus europaeus*
Wayfaring tree *Viburnum lantana*
Guelder rose *Viburnum opulus*
Hazel *Corylus avellana*
Holly *Ilex aquifolium*
Oak *Quercus robur*
Field maple *Acer campestre*
Beech *Fagus sylvatica*
Crab apple *Malus sylvestris*
Dogwood *Cornus sanguinea*
Dog rose *Rosa canina*

It is recommended that all retained trees are protected in accordance with British Standard 5837:2012, with the establishment of appropriate root protection zones.

5.1.2 Lake Creation

It is recommended that the new lake is designed and created to provide suitable habitat for aquatic invertebrates, wetland plants and amphibians.

It is recommended that the lake has shallow, convoluted edges to encourage invertebrates and aquatic plants. Please see Figure 2 below, taken from the Great Crested Newt Conservation Handbook (Langton *et al.*, 2001), showing a cross-section of a pond with convoluted edges and showing suitable aquatic and marginal plant species.

The deepest areas of the pond should measure between 2m and 3m with small bays or shallows at the pond's edges (0.3m-1m). The shallow areas will provide other small newt species and frogs within breeding sites. The shallow areas and edges could be planted with native marginal and aquatic species, such as shown in Figure 2.

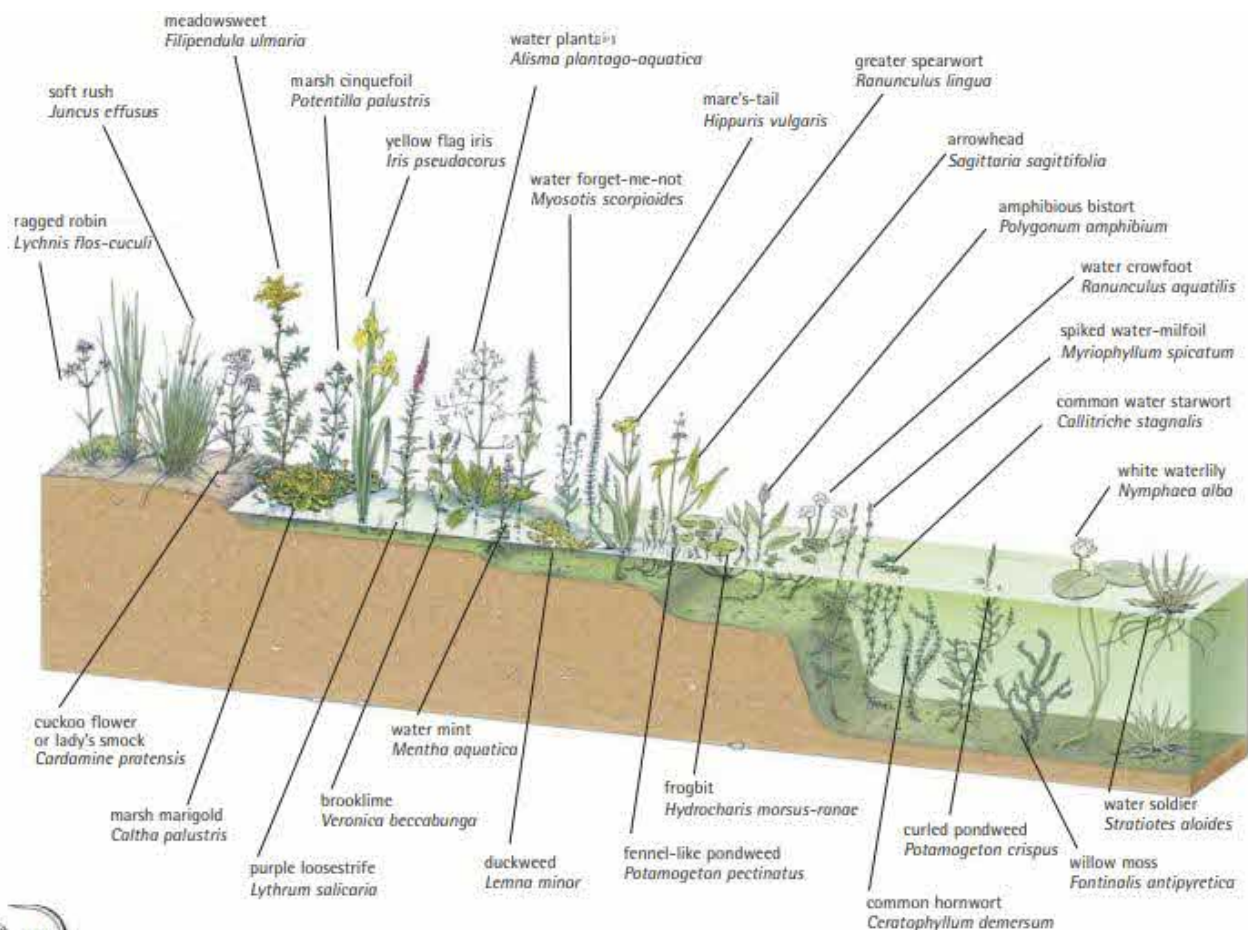


Figure 2. Diagram showing a cross-section of a pond/lake edge with convoluted edges with native marginal and aquatic planting. Source: (Langton *et al.*, 2001).

The upper reaches of the shallows will create a seasonal 'drawdown zone' – an area of mud and vegetation which is likely to become flooded in winter and spring and will progressively dry as water levels fall in summer.

The ever-changing drawdown zone is one of the most important areas of a pond/lake. It is an exceptionally rich habitat for plants and invertebrates and is often used by birds and small mammals as a feeding area. The graded water levels of the lake should create varying habitats for plants as well as insects and amphibians, with the deeper areas having a greater buffer from cold air cooling and freezing the upper layers of the lake; aiding survival for those species which over winter in ponds, including some newts.

A number of suitable aquatic plant species suitable for the lake are recommended in Table 1. This list includes species which are adapted to the margins and boggy edges of lakes, as well as submerged species of deeper water and emergent plants of the shallows. By adding plant

biodiversity, the lake will also become suitable habitat for a diversity of invertebrates and the emergent planting will offer nesting sites and cover for amphibians and grass snakes.

Table 1. Native species for lake planting.

Common Name	Botanical Name
Ragged robin	<i>Lychnis flos-cuculi</i>
Watercress	<i>Nasturtium officinale</i>
Brooklime	<i>Veronica beccabunga</i>
Yellow iris	<i>Iris pseudacorus</i>
Branched bur-reed	<i>Sparganium erectum</i>
Flowering rush	<i>Butomus umbellatus</i>
Water plantain	<i>Alisma plantago-aquatica</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Yellow loosestrife	<i>Lysimachia punctata</i>
Water mint	<i>Mentha aquatica</i>
Frogbit	<i>Hydrocharis morsus-ranae</i>
Amphibious bistort	<i>Persicaria amphibia</i>
Water forget-me-not	<i>Myosotis scorpiodes</i>
Water starwort	<i>Callitriche stagnalis</i>
Curled pondweed	<i>Potamogeton crispus</i>
Water crowfoot	<i>Ranunculus aquatilis</i>
Marsh marigold	<i>Caltha palustris</i>
Cuckoo flower	<i>Cardamine pratensis</i>
Marsh woundwort	<i>Stachys palustris</i>
Hemp agrimony	<i>Eupatorium cannabinum</i>
Gipsywort	<i>Lycopus europaeus</i>

Certain non-native aquatic plants should be strictly avoided, and they can cause serious damage to ponds/lakes and natural watercourses as they spread very quickly and easily, forming dense mats of vegetation. A reputable supplier of aquatic plants should be used, and the plants should be checked thoroughly prior to planting for any evidence of the following invasive, non-native species.

Australian Swamp stonecrop / New Zealand pygmyweed *Crassula helmsii* / *Tillaea recurva*
 Fairy fern *Azolla filiculoides*
 Parrot's feather *Myriophyllum aquaticum*
 Floating pennywort *Hydrocotyle ranunculoides*
 Himalayan balsam *Impatiens glandulifera*
 Canadian pondweed / Nuttall's pondweed *Elodea canadensis* / *Elodea nuttalli*
 Curly waterweed *Lagarosiphon major*

5.1.3 Grassland Creation

It is recommended that the proposed wildflower grassland areas are sown with an appropriate mix, to reflect the site's location within the Cotswold Hills, such as Emorsgate EM6 Mix for Limestone Soils, or similar. Alternatively, seed could be sourced from a local wildflower meadow.

These areas should be managed as 'hay' meadows, with the sward allowed to grow and flower between March and late-July, with a cut in late-July or August during dry weather. The cuttings/arising should be allowed to drop their seed over a number of days, before being removed. Subsequent cuts could be undertaken to maintain a tidy sward through the autumn.

5.2 Species

5.2.1 Bats

Licensing

As previously discussed, a European Protected Species (bat) Licence is not considered to be necessary for works to proceed. This is due to the fact that roosting bats are considered to be absent from the buildings that will be affected by the proposals.

Timing

No timing constraints are considered necessary with regard to bats.

Careful Work Practices

As bats are a highly mobile species, and given the fact that there are roosting bats within the dwelling of Copse Hill House, contractors should be briefed with regard to the fact that individual bats can often exploit very small crevices as roost sites (such as gaps in stonework) and that bats can move between roost sites on a regular basis.

In the very unlikely event that bats or significant evidence of bats (for example large accumulations of fresh bat droppings) are encountered, works should stop immediately, and advice sought from a suitably qualified ecologist.

Bat Box Enhancement Measures

Although it is not necessary from a legal perspective, consideration should be given to the erection of bat boxes on parkland and woodland trees, to provide habitat enhancement.

External Lighting

It is recommended that new external lighting should be avoided, unless it is necessary for reasons of security and safety. In particular, light spillage around known bat roost locations and new bat roosting features (bat boxes) and into nearby trees should be avoided, so that a dark corridor is created around the peripheries of the buildings in order to facilitate the movement of bats, as well as other nocturnal wildlife.

Where external lighting is required, it should be kept at low level and a low intensity, with hoods and baffles used to direct the light to where it is required (Bat Conservation Trust 2008, Emery 2008). To minimise the impact on bats, the use of low pressured sodium lamps is recommended in preference to mercury or metal halide lamps which have a UV element that can affect the distribution of insects and attract bats to the area, affecting their natural behaviour (Bat Conservation Trust 2008).

The key principals for choosing a suitable type of lamp are:

Avoid blue-white short wavelength lights: these have a significant negative impact on the insect prey of bats. Use alternatives such as warm-white (long wavelength) lights as this will reduce the impact on insects and therefore bats.

Avoid lights with high UV content: (e.g. metal halide or mercury light sources) or reduce/completely remove the UV content of the light. Use UV filters or glass housings on lamps which filter out a lot of the UV content.

Selecting an appropriate lamp unit that is designed to be environmentally friendly will minimise light spill, but further controls can be imposed by installing directional accessories such as baffles, hoods and louvres on lamps to direct light away from ecologically sensitive areas, such as parkland and nearby trees.

LED (Light Emitting Diode) units are an effective way to direct the light into small target areas and are recommended for lighting the proposed parking and turning area. Composite LEDs can be switched off to reduce/direct the light beam to specific areas.

5.2.2 *Birds*

Removal of trees and/or shrubs should be undertaken outside of the bird breeding season (avoiding March to August, inclusive) so as to avoid any impacts on active birds' nests.

Alternatively, if this is not possible, and vegetation clearance is required between March and August, an ecologist should be appointed to assess if there are any risks to breeding birds to ensure compliance with the legal protection afforded to nesting birds under the Wildlife and Countryside Act 1981. This may require a survey for nesting birds by the ecologist immediately prior to the vegetation clearance works (usually recommended within 24 hours). If nesting birds were present within the vegetation, work would need to be delayed in the vicinity of the nest to avoid damage or destruction of the nest until the young have fledged.

The erection of bird nesting boxes is recommended in order to provide suitable nest sites for species within the local area, as nest boxes can be excellent substitutes for the holes found in old trees. Over 60 species are known to adopt nest boxes including blue tits, great tits, starlings, robins and sparrows. The location and nature of the nest box depends on the species it is designed for; boxes for tits, sparrows or starlings should be fixed two to four metres up a tree or a wall; open-fronted boxes for robins and wrens need to be low down, below 2m, and well-hidden in vegetation. Unless there are trees or buildings which shade the box during the day, boxes should be faced between north and east, thus avoiding strong sunlight and the wettest winds.

On buildings, the integration of bird boxes is particularly recommended as species such as house sparrow will readily adopt such features as nest sites. The following bird nesting features are recommended:

Schwegler Sparrow Terrace 1SP (for integration into buildings)
Schwegler Avianex 1MR Bird Box (for erection on trees)

5.2.3 *Amphibians*

It is recommended that a precautionary approach is adopted with regard to amphibians. The lawns and garden habitats of the site should continue to be mown and maintained, in order for these habitats to remain unsuitable for amphibians and so that shelter is not provided to amphibians whilst on land. Similarly, the improved grassland should continue to be grazed in order to maintain a short sward and to remove shelter for amphibians.

The site owner/site manager will ensure that anyone undertaking construction works on the site (including sub-contractors) is made aware of the protected status of great crested newts and the procedure to follow in the unlikely event that common reptiles are discovered during works.

In the very unlikely event that a great crested newt is encountered, works should stop, and advice sought from a suitably experienced and qualified ecologist.

Within the construction zone, the following methods of working will be adopted:

Clearance of any logs, brash, stones, rocks or piles of similar debris will be undertaken carefully and by hand.

Clearance of any tall vegetation will be undertaken using a strimmer or brush cutter with all cuttings raked and removed the same day. Cutting will only be undertaken in a phased way which may either include:

- Cutting vegetation to a height of no less than 30mm, clearing no more than one third of the site in anyone day or;
- Cutting vegetation over three consecutive days to a height of no less than 150mm at the first cut, 75mm at the second cut and 30mm at the third cut;

Following removal of tall vegetation using the methods above, remaining vegetation will be maintained at a height of approximately 30mm through regular mowing or strimming to discourage amphibians moving into the site.

Ground clearance of any remaining low vegetation (if required) and any ground works will only be undertaken following the works above.

Any trenches left overnight will be covered or provided with ramps to prevent amphibians from becoming trapped.

Building materials such as bricks, stone etc. will be stored on pallets to discourage amphibians from using them as shelter. Any demolition materials will be stored in skips or similar containers rather than in piles on ground.

5.2.4 Hedgehogs

It is recommended that any new garden fences or walls (that could act as a barrier to hedgehog movement) are made permeable for hedgehogs. This can be achieved by cutting or leaving a 13cm-by-13cm hole within the fence or wall; this is sufficient for any hedgehog to pass through, and this is too small for nearly all pets.

6 References

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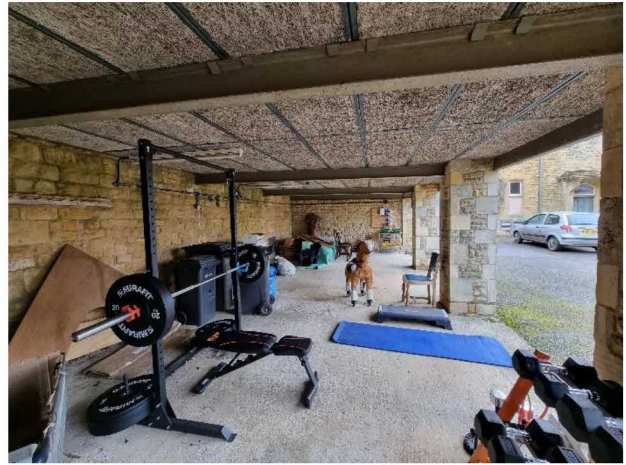
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7 Appendix 1. Photographs



Photograph 1. The attached garage viewed from the west.



Photograph 2. The internal space of the attached garage.



Photograph 3. The outbuilding, and area of hard-standing, viewed from the east.



Photograph 4. The southern elevation of the outbuilding, the swimming pool and pool building (right).



Photograph 5. The internal space of the outbuilding.



Photograph 6. The pool building viewed from the east.



Photograph 7. The pool and pool building.



Photograph 8. Improved grassland within the area of the proposed lake, with trees and hedge in the background.



Photograph 9. Detail of the improved grassland habitat.



Photograph 10. A terrace to the east side of Copse Hill House.



Photograph 11. A terrace, with lawns and shrubs, to the south side of Copse Hill House.



Photograph 12. Flower bed and shrubs to the north and east of the attached garage.



Photograph 13. Hard-standing between the attached garage and outbuilding.

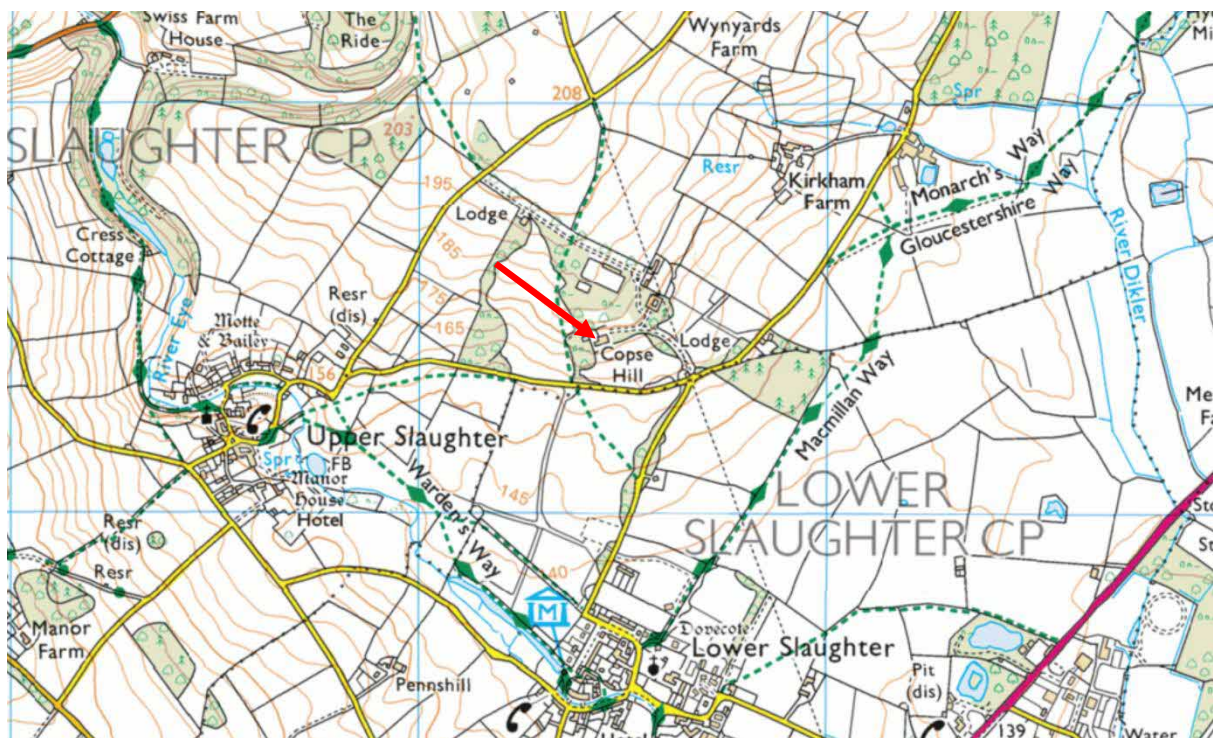


Photograph 14. Terrace with lawns to the west side of Copse Hill House.

8 Appendix 2. Site Location Plans



Aerial photograph showing the approximate location and extent of the proposed lake at Copse Hill House (indicated by the red outline). The attached garage, outbuilding, pool and pool building are indicated by the blue outline. Source: <http://www.bing.com/mapspreview>



Ordnance Survey map showing the approximate location of Copse Hill House (indicated by the red arrow) within the local area. Source: <http://www.bing.com/mapspreview>