Grimley Parish Council

Ecological Compliance and Long-Term Maintenance

MANAGEMENT PLAN for BIODIVERSITY

MONKWOOD GREEN

Photo of the Green taken about 1930

NB. Information on legally protected, rare or vulnerable species may appear in this document. It is recommended that appropriate caution be exercised when circulating copies.

Contents

REPORT CONTROL SHEET

General Report Information	
Any significant site risks	None known. Be aware of ponds, ditches and boggy areas and the well (presently uncapped).
Ecologists	Dr C J Betts, K A McGee, G A Cone, E J Breakwell.
Residents' Association Representative	Richard Weaver
Contract manager	Grimley Parish Council

Report Version Control

PLEASE ALWAYS ENSURE YOU HAVE THE LATEST VERSION
Documents are regularly updated — if in doubt please ask us

Version	Date	Author	Description
1.0	1 February 2016	Dr C J Betts	First Draft
1.1	15 February 2016	Dr C J Betts	Revised with primary feedback edits
1.2	23 February 2016	Dr C J Betts	Minor amends following PC meeting 22 February 2016
1.3	30 March 2017	Dr C J Betts	Updates of annexes on Natural Capital, *etc.*
1.4	10 October 2017	Dr C J Betts	Various updates (including grazing, clearance works, contacts, *etc*.)

Whilst all due and reasonable care is taken in the preparation of management plans, the authors and their agents accept no responsibility whatsoever for any consequences of the release of this document to third parties.

Important. Management Plans for Biodiversity may represent the implementation of planning obligations, contractual arrangements, legal observance and regulatory compliance relating to the site described, its species and habitats. Transfer of land ownership, changes in boundaries or other alterations of status do not reduce or remove these obligations or the requirements of compliance.

MANAGEMENT PLAN FOR BIODIVERSITY – SUMMARY

Site: Monkwood Green, Hallow, Worcester WR2 6NX.

Ordnance Survey Grid ref.: SO801602

Locality: Grimley Parish.

Status: Mostly Site of Special Scientific Interest (SSSI.

Area: About 8ha.

Description: Permanent rough pasture on heavy clay-loam Severn Terrace soils; acidic and mesotrophic grassland of high nature conservation value and scarcity in Worcestershire. Notable species include a large population of green-winged orchid *Anacamptis morio,* petty whin *Genista anglica*, its uncommon lepidopteran associate *Coleophora genistae*, black poplar *Populus nigra*, glow-worm *Lampyris noctiluca*, foraging barn owl *Tyto alba*, yellowhammer *Emberiza citrinella*, great crested newt *Triturus cristatus,* foraging bats of several spp, yellow-necked mouse *Apodemus flavicollis* and many others.

Principal Objectives: To return the Green to Favourable Conservation Status (FCS) under an economically viable, low resource input regime. Monitor and maintain that FCS in compliance with the stated objective to halt the loss of biodiversity by 2010 to which the UK has signed up.

Prescription: There are five main elements of the prescription (greater detail in the main text). These are:

1. Clear and control encroaching scrub;
2. Halt and reverse excessive hydroseral succession in ponds, clearing all ditches to return them to functional drainage;
3. Install suitable facilities to contain grazing animals (“smart” fencing is recommended);
4. Establish an appropriate and permanent grazing/cutting regime to maintain FCS of desired habitats;
5. Write and implement a Natural England approved Management Plan to guide and prescribe ongoing management, recording and monitoring (*i.e.* this document).

Managing Agency: Grimley Parish Council.

Duration: Permanent
In order to assure that the long term objectives of biodiversity protection and enhancement comply with EU and UK policy, this MPB is attached to the land concerned. The obligations for the operation of the MPB would continue to be binding upon new owners and occupiers of that land with any change of ownership.

Signed:
……..
For and on behalf of Grimley Parish Council
Dated:

Signed:
……..
For and on behalf of Natural England (DEFRA)
Dated:

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SITE ACCESS & SAFETY

Monkwood Green is common land but anyone entering any green space area does so entirely at their own risk and must be aware of their own safety and the safety of others. The countryside and green spaces are generally safe in Britain, but they are not without risk. Please note the well in the south-west quadrant of the Green which is not presently capped.

www.gov.uk/government/publications/the-countryside-code

Know and follow the Countryside Code — you can see it in full at the above web address. The main principles everyone should observe are:

- Respect other people;
- Consider the local community and other people enjoying the outdoors;
- Leave gates and property as you find them and follow paths unless wider access is available;
- Protect the natural environment;
- Leave no trace of your visit and take your litter home;
- Keep dogs and cats (which should always have bells) under effective control;
- Dog fouling is a crime (Clean Neighbourhoods and Environment Act 2005) — always clean up and dispose hygienically;
- Enjoy the outdoors by planning ahead and being prepared;
- Follow advice and local signs – there is a Parish Notice Board on Monkwood Green by the post box.

General considerations in the countryside. Be aware of zoonoses (diseases carried by animals) such as Lyme & Weil's Diseases, blue-green algae, poisonous plants & fungi, tetanus, hazardous animals, insects that bite & sting, and the risks of cat & dog faeces & urine. And please wear suitable footwear and clothing, check your mobile phone's signal* and battery and keep it with you, and make sure someone responsible knows where you are and when you will return. Always supervise children and take particular care near water.

See also http://guidanceanddata.defra.gov.uk/smarter-guidance/.

*At the time of writing, the mobile phone signal on Monkwood Green remains patchy at best, despite a long history of trying to make the operators improve it. It is worth trying different locations as walking a few metres can make a big difference.

INTRODUCTORY NOTES

Biodiversity is fundamental to us all and to the continuity of life on this planet. In these times of extensive decline in species numbers and of habitat in terms of both quality and extent, protecting, extending and wisely managing our green spaces are paramount. As a Site of Special Scientific Interest, caring for Monkwood Green in a way that protects and enhances its biodiversity is of exceptional importance.

For hundreds of years, the Green was grazed by a mixture of stock, managed by those with Commoners' Rights that also included pollarding of the Green's trees, collecting firewood, *etc*. This intensive use kept the vegetation short (see photograph on front page) but still led to a multiplicity of micro-habitats and niches for a wealth of wild species living in concert with this ancient bucolic land-use. Today, although some have retained their rights, the land has largely been left to its own devices beyond occasional cutting and sporadic grazing. Consequently, ponds have become choked, ditches no longer function, scrub and coarse vegetation have invaded and the ecology has been altered to the detriment of some species and the advantage of others, the latter not infrequently being less desirable in nature conservation terms: the spread of the coarse tufted hair-grass *Deschampsia caespitosa* that suppresses finer forbs is a good example of an undesirable invasive species that has impoverished the Green's flora.

Attempts have been made to reverse undesired ecological succession but with limited success. Cutting the parts of the Green that are flatter and drier annually in summer has discouraged woody scrub and encouraged a valued hay meadow flora, referable now to the National Vegetation Classification's MG5 *Centaureo-Cynosuretum cristati*, although that is not what would have been a typical community of the Green in days of yore. Elsewhere the grassland has remained somewhat more acidic and, notably in the area west of the Sinton Green Road, some sporadic grazing has been introduced to mimic older land-use practices. Here, there are large and ancient anthills as well as the last remaining bushes of petty whin *Genista anglica,* alone in the county now, and the terrain is unsuitable for mowing. An attempt to cut this area in 2014 was poorly controlled and led to damage of many anthills as well as a forb-suppressing thatch left covering the sward. Efforts to cut back overly invasive scrub were partially successful but ultimately it has so far proved too large a task for the labour available.

The principal objective of this Management Plan is to provide a practical way forward for Grimley Parish Council to return Monkwood Green to Favourable Conservation Status but without being so ambitious as to be beyond the means of the Parish and those volunteers of the Residents' Group and others who are so kindly willing to donate their time. There will, though, be a need for permanent and realistic funding from DEFRA/Natural England and others if the natural assets for which the site was designated are to be restored and permanently protected. Further commentary on this is given in the main text.

In a more general sense, all those with operational or proprietorial responsibilities for sites and estates must comply with extant wildlife law, which is both extensive and complex as well as being increasingly strictly enforced. For example, there are more than six hundred wild species protected by law in Britain, and at least a dozen separate legislative instruments covering the protection of animals, plants and habitats, some of which are within the criminal law framework and carry significant penalties for offences. These are presently under review by the Law Commission who are proposing a more consolidated and practical legislature, but the existing precepts will remain. Because of the increasing and worrying loss of wild species, in 2011 a new plan to halt the loss of biodiversity by 2020 was ratified in the EU (European Commission 2011) under the Convention on Biological Diversity (CBD). Britain is a signatory of the CBD

and it is fully applicable here. Please see the main text and End Notes for more. The UK government is also advised by the Natural Capital Committee[1]. It is obvious, therefore, that a demand has arisen for efficient, expert, long-term care and monitoring of the habitats and species on land subject to statutory controls and designations.

It is very important to remember that diversity in ecology is not just about the number of individual species ("species-richness") but includes their relative abundance. The huge wildlife losses we have experienced in recent years are more than of individual species of animals and plants that have become rare or extinct, but embrace the literally uncountable reduction of abundance ("bioabundance" if you like) in individuals of so many species that just a few decades ago were very common.

This Management Plan for Biodiversity (MPB) has been devised and produced for the protection and enhancement of biological diversity and biological abundance on Monkwood Green, and to support ecosystem services[2]. The Plan takes an ecosystem approach to ensure long-term care and enhancement, and to facilitate compliance on site with regulations, best practice and the law relating to wildlife, ecology and nature conservation. It is designed to be an efficient guiding document to underpin the appropriate implementation of the specified ecological management of the Green. Whilst it is written on the understanding that Grimley Parish Council will have access to trained and suitably experienced ecological scientists and is therefore not intended to be a manual of techniques, the MPB's text aims to be logical and straightforward enough to be generally accessible by the non-specialist.

An important element of the MPB is its review at the agreed intervals and, when necessary, its amendment to meet changing circumstances and verify that the over-arching aim of *no net loss but rather a net gain in biodiversity* is being achieved. Some aspects of the MPB are based on the Nature Conservation Management Plan model recommended by Natural England (Nature Conservancy Council 1988). It is also written with government policy on biodiversity (Defra 2011 and updates) in mind as well as British Standards such as BS 42020:2013 and BS 8583: 2015 where these are relevant.

[1] See https://www.naturalcapitalcommittee.org/. The third State of Natural Capital report has recently been published.

[2] If you would like a copy of the leaflet on Ecosystem Services published by Betts Ecology, please email christopherbetts@betts.eu.

Please note that baseline data, plans and descriptions of the site and its ecological components can be found in the Annexes. Bulky items and future additions may be stored separately.

SECTION A: COMPLIANCE AND BEST PRACTICE

1 Regulatory requirements with which this MPB is designed to comply

1.1 The primary regulatory statute affecting Monkwood Green is its designation as a SSSI dating originally from 1975. The designatory papers and plans may be found in the Annexes (Section C) with the list of proscribed activities. The SSSI was assessed as in favourable condition by Natural England on 1 September 2014 although that was probably unintentionally confusing due to the assessment protocol's lack of weight given to the grassland degradation, excessive scrub encroachment, choking of ponds and ditches and inappropriate/deficient management.

1.2 The Green is home to a number of legally protected species, including barred grass snake *Natrix helvetica*, slow-worm *Anguis fragilis*, great crested newt *Triturus cristatus* and several nesting birds. It also provides foraging for strictly protected species that roost/nest elsewhere such as bats and birds such as barn owl.

2 Management Suggested by Natural England

2.1 English Nature, as Natural England then was, published its views on the management of Monkwood Green SSSI on 4 March 2003 as follows:

This statement represents English Nature's views about the management of the SSSI for nature conservation. This statement sets out, in principle, our views on how the site's special conservation interest can be conserved and enhanced. English Nature has a duty to notify the owners and occupiers of SSSI of its views about the management of the land. Not all of the management principles will be equally appropriate to all parts of the SSSI. Also, there may be other management activities, additional to our current views, which can be beneficial to the conservation and enhancement of the features of interest.

The management views set out below do not constitute consent for any operation. English Nature's written consent is still required before carrying out any operation likely to damage

the features of special interest (see your SSSI notification papers for a list of these operations). English Nature welcomes consultation with owners, occupiers and users of the SSSI to ensure that the management of this site conserves and enhances the features of interest, and to ensure that all necessary prior consents are obtained.

Management Principles
The maintenance of the grassland communities at this site depends on active management. If neglected, the sward becomes dominated by tall, vigorous grasses or bracken [we have not observed any] *which, together with an associated build-up of dead plant matter, suppress less vigorous species and reduce the botanical richness of the site. Eventually the sward reverts to scrub and even woodland that is usually of lower nature conservation value than the grassland that preceded it. Traditionally, management has consisted of stock grazing and this remains the most appropriate management tool. Grazing, through the removal of plant matter and nutrients, helps to maintain an open sward. It also, through disturbance and trampling, creates areas of open ground suitable for colonization by the lichens, ephemeral plants and invertebrates that are often characteristic of this type of grassland. Rabbit grazing, though difficult to control, can be a useful management tool in some situations. Occasional management of invasive scrub and bracken may be necessary but no other management should be routinely required. The application of pesticides including herbicides, lime, or fertilizer would be damaging and should be avoided.*

As an interim measure before grazing can be reintroduced to the whole site, cutting of hay from flat areas without anthills is acceptable. (*NB*. September 2017. Sheep grazing has been successfully introduced over the anthill area this summer.)

(Monkwood Green Views About Management, Countryside and Rights of Way Act 2000, Schedule 11(6) Version date: 04/03/03 Page 1 of 1.)

2.2 In summer 2014, Natural England granted permission for interim management works on part of the SSSI during 2014–2016 where the greatest degradation had occurred as follows (with update notes as at September 2016 by the author in brackets in blue):

Please refer to map below.

Area A

- *Thin and push back scrub towards the woodland by 75% to leave a scalloped edge. (Good progress made with this during 2017.)*
- *Cut stumps to be treated with an appropriate herbicide painted on within 1 hour of cutting. (Many stumps are re-sprouting and require re-cutting and re-treatment.)*
- *Brash to be removed from the SSSI site for disposal or burnt/brash piled on areas agreed on site with Natural England. (Brash burnt.)*

Area B

- *Thin and push back scrub towards the track by the woodland by 75% to leave a scalloped edge.*

- *Cut stumps to be treated with an appropriate herbicide painted on within 1 hour of cutting.*
- *Brash to be removed from the SSSI site for disposal or burnt/brash piled on areas agreed on site with Natural England.*

(Good progress as above but more to do. The great crested newt pond in this area has been cleared.)

Areas C & D

- *Thin out scrub by 75%, cut stumps to be treated with an appropriate herbicide within 1 hour of cutting.*
- *Where there is gorse within the scrub this will be managed by rotational cutting and stumps will NOT be treated with herbicide.*
- *Remove young sapling oaks and other trees and stump treat. A number of specimen trees to be identified and retained in agreement with Natural England where appropriate.*
- *Brash to be removed from the SSSI site for disposal or burnt/brash piled on areas agreed on site with Natural England.*

(Largely achieved – some stumps may need re-treating.)

Area E

- *Manage pond marginal vegetation by rotational cutting/coppicing. These stumps will NOT be treated with herbicide.*
- *Brash to be removed from the SSSI site for disposal or burnt/brash piled on areas agreed on site with Natural England.*

(Work done but pond needs further clearance and stumps need re-treating. Brash needs cutting again.)

Area F

- *Interim cutting of vegetation using a 'Rytec' type flail, cut and collect machine as required whilst a solution is found to reintroduce grazing to this area. All arising to be removed from the site for disposal or burnt/brash piled on agreed areas.*
- *Areas of established ant hills will be avoided where possible.*

(Mowing successful in this area.)

Area G

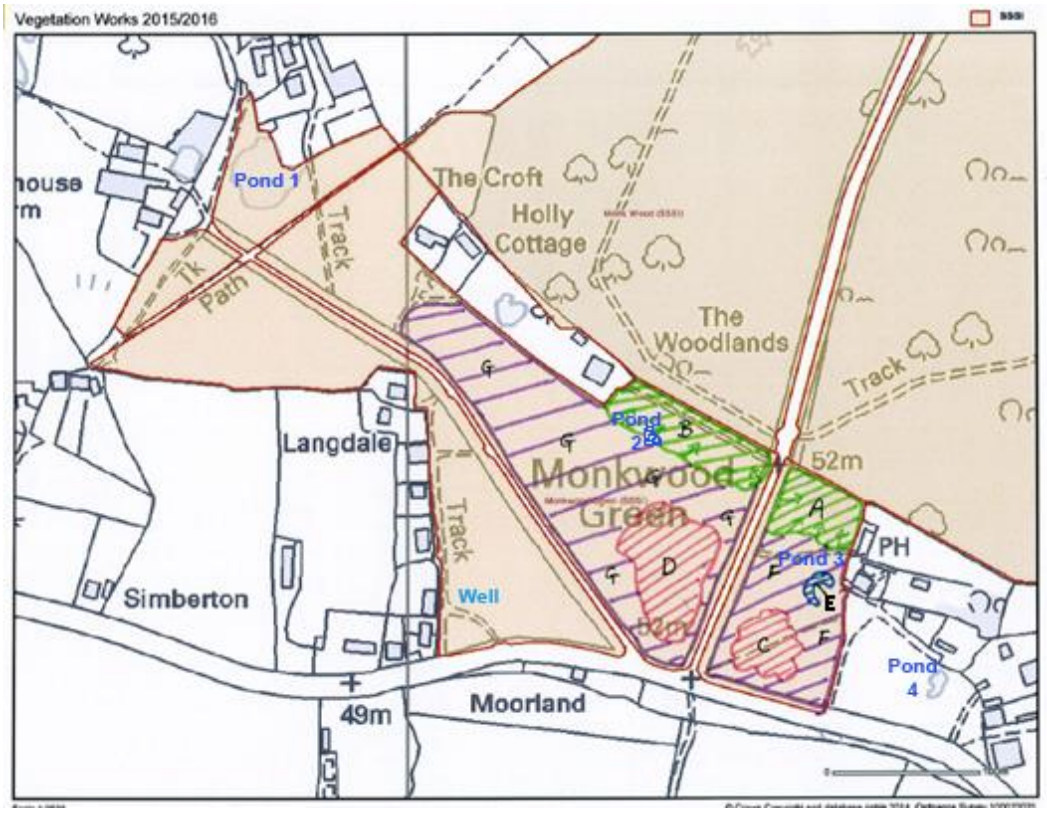
- *Remove 75% of scattered scrub bushes from the wider grassland areas leaving the occasional scattered bush.*
- *Cut stumps to be painted with an appropriate herbicide within 1 hour of cutting.*
- *Remove young sapling oaks and other trees and stump treat. A number of specimen trees to be identified and retained in agreement with Natural England where appropriate.*

- *Brash to be removed from the SSSI site for disposal or burnt/brash piled on areas agreed on site with Natural England.*
- *Interim cutting of vegetation using a 'Rytec' type flail, cut and collect machine as required whilst a solution is found to reintroduce grazing to this area. All arising to be removed from the site for disposal or burnt/brash piled on agreed areas.*

  (The Rytec caused significant damage to anthills in this area and work was halted. Grass arisings were not successfully removed. Petty whin and heather have been marked and secured. This area is now being successfully grazed by sheep in a rotational regime using electric fencing.)

General Management

- *All works to be carried by hand using hand tools, chainsaws or brush cutters.*
- *A tractor/loader and trailer will only be used on site when ground conditions are suitable and rutting or damage to the sward can be avoided.*
- *Follow up cutting of cleared areas of scrub will be required and carried out to encourage the establishment of an appropriate grassland sward. To be carried out using a 'Rytec' type flail, cut and collect machine.*
- *Interim cutting of vegetation to be carried out by a small tractor and 'Rytec' type flail, cut and collect machine outside the bird nesting season and <u>after important vegetation has set seed</u>. (It was cut too early in 2017.)*
- *Whist carrying out the works an eye will be kept out for the plant petty whin. If found the location will be recorded and the appropriate management decided with Natural England. (It was found and is recovering well through hand weeding and grazing management.)*



2.3 Grimley Parish Council were granted formal permission for the above works in a time frame as below by Natural England such that the proscribed operations (4, 6, 8, 11, 12, 22, 26 and 27 – see Annexes) on the SSSI were waived under Section 28(E)(1)(a) of the Wildlife and Countryside Act 1981.

Timing of proposed operations:
Scrub clearance work to be carried out over the Autumn/Winter period between 15 September and 15 March each year in both 2014/15 and 2015/16. *(More to do.)*
Vegetation cutting using a 'Rytec' Cut and Collect type machine to be carried out after the main bird nesting season and after any desirable plants have set seed. *(It was cut too early in 2017.)*
Specific cutting of regenerating areas of scrub may be carried out at other times to prevent its reestablishment/spread and to encourage a more desirable habitat to develop.
Tree surgery work on the Black Poplars if required is best carried out between November and February, when the tree is dormant and before spring growth begins. It is thought that February is the optimum time within this period.
All works are just interim measures for the 2014 – 2016 period whilst options for re-introducing grazing can be looked at.

3 The selected nature conservation, biodiversity and related management options

3.1 Given the limited success of the above operation and following a meeting of the Parish Council on 18 January 2016, where it became clear that confusion has arisen about what would be best ecologically for the Green within the constraints of available resources, it was decided to produce a Management Plan to submit to Natural England/DEFRA with proposals for a clear and achievable way forward with which the Parish Council would be comfortable. This Plan, if acceptable to all parties and successfully funded/resourced, could then be formally approved and implemented.

3.2 The general management options selected to meet the compliance and best practice requirements for Monkwood Green within the available resources (always assuming funding for fencing and ditch restoration works, and contractor assistance at least at present levels for vegetation management) are summarised in Table 1 below. More detail will be found in the next Section of this MPB.

Table 1: The selected nature conservation and related management options for Monkwood Green.

Management Option	Option(s) selected and reason	Comment
Habitat Management		
Non-intervention	—	
Limited intervention	—	
Active management	Yes	The Green's habitats require continuing management to maintain the desired ecological communities. In the absence of this it will revert to coarse grassland, scrub and ultimately NVC W8 woodland.
Linkage	Extant – no change	There is good ecological linkage to Monkwood and along peripheral hedges, verges & ditches to adjacent farmland.
Species Management		
Non-intervention	—	
Control/reduction	Yes	Excessively invasive scrub and reduction of coarse grasses such as *Deschampsia caespitosa* through grazing/mowing regime. Any colonizing invasive alien species (IAS[3]) will also be considered for control.
Encouragement/increase	Yes	Species notable for conservation, especially those such as petty whin and its dependent micro-moth, will be encouraged to spread.
Reintroduction	None planned	As habitats improve, species lost due to present habitat deterioration may return spontaneously.

[3] It should be noted that species and ecosystems are dynamic. Colonisation occurs, species disperse and there is a constant ebb and flow as communities adjust to competition, predator–prey relationships, and environmental change. Professor John Harper's Thespian analogy of climate and substratum providing scenery and stage for a large cast of plant and animal players, which come and go, is an apposite concept: the players act out a tragedy dominated by hazard, struggle and death in which there are few survivors (Harper 1977). One could add that the play is delivered in a foreign tongue, without a plot and at a scale of space and time outside normal human experience, to which it is challenging to relate. Nonetheless, it is by probing the intricacies of the system, testing hypotheses and recording observations over a period of time that some understanding may be gained. Whilst some undeniably affect the stability, diversity and richness of communities and ecosystems adversely, we should not leap too quickly to anthropocentric conclusions about colonisers.

Management Option	Option(s) selected and reason	Comment
Introduction	None planned	Introductions are difficult and in any case would require Natural England's prior formal consent.
<u>Study and Research</u>		
No facilities	—	
Specialist facilities	—	
Controlled facilities	By prior permission	Ecological and land-use study and research projects are encouraged by Grimley Parish Council provided they are approved in writing in advance and that copies are received of all results. Any publications must be copied to and acknowledge the Parish Council.
Open facilities	—	
<u>Education and Interpretation</u>		
Publicity	Some	Positive (free) publicity welcomed that will attract financial and volunteer assistance.
Promotion	Yes	Grimley Parish Council are keen to encourage educational projects by schools (with prior permission, please)[4] and activities such as wildlife recording and photography. All records should be copied to the Parish Council.
<u>Public Access and Recreation</u>		
Monkwood Green is open to those with Commoners' Rights, walkers (on designated footpaths and public roads) and others granted permission by the owners, Grimley Parish Council.		

3.3 In Section B below, the projects considered achievable to meet the identified nature conservation requirements as far is possible within the likely (hoped for) resources available are set out with the prescription developed in order to attain them.

4

SECTION B: PROJECTS AND PRESCRIPTION

Introduction to this section

Programme work-streams
Plans for managing habitats and wildlife need structured content as well as flexibility. Below the work we anticipate for this site is grouped as work-streams to help organise and communicate the MPB function. This is an ideal scenario based on that used elsewhere by Natural England. It is unlikely that no more than the affordable basics can be implemented, for the time being at least. Nevertheless, it is worth setting out the desired ideals.

Finding and recording the wildlife	Ecological surveys/biodiversity projects.
Defining the wildlife	Ecological Network mapping.
Uncovering heritage	Archaeology, history, culture, *etc*.
Communication	History/education/workshops/study groups.
Access	Paths, interpretation.
Education	Working with people — young and old; involvement of schools.
Health	Nature and greenspace for therapy and wellbeing. (This is well documented.)
A future for commons	Conservation grazing, improving/conserving common ground generally.
Grazing for sward health & biodiversity	Fenced/fenceless conservation grazing.
Neighbourhood watch	Environmental care and respect, targeting areas of vandalism/fly tipping/litter, dog mess, *etc.* should these arise. Presently, such problems are rare.
Celebrating nature and biodiversity	Events and publicity.

4 The projects selected to meet regulatory compliance and good practice criteria

The following projects and project areas have been identified as at January 2016. Additional projects may be added as required with the passage of time and in response to changes in the natural history and other conditions of the Green, as well as funding. Please refer to the plans in the annexes for location of areas, and boundaries and features such as ponds.

Clearance and control of encroaching scrub.

4.1 Complete the clearance of excessive scrub and stump treatment as agreed with Natural England. Areas A and B: thin and push back scrub towards the woodland by 75% to leave a scalloped edge, treating cut stumps with an appropriate herbicide – Roundup® Tree Stump and Root Killer (glyphosate acid) has been found effective – painted on within 1 hour of cutting. Areas C and D: thin out scrub by 75% (retaining the gorse) and treat cut stumps as Areas A & B; review all trees in Area D, marking up for removal all those smaller planted ones that have been unsuccessful and/or are overcrowding the finer specimens. Generally, keep those with mistletoe. Area G: remove 75% of scattered scrub bushes and all tree saplings (but not mature/semi-mature trees) from the wider grassland and treat stumps as above.

4.2 Stack cut brash neatly and allow to rot down. (Excessive brash may be burned but only on areas without grass sward.)

4.3 Monitor stumps and re-treat where necessary.

Installing suitable facilities to contain grazing animals.

Ideally, cattle grids on the three entrance roads to Monkwood Green would be the ideal solution (permanent, easier for stock husbandry, very low maintenance, proven to be successful elsewhere, *e.g.* Pound Green). They are very expensive to install, though, and may take a long time to plan and approve (maybe four or five years if PINS involved and a public Inquiry is needed). Nonetheless, this option should be investigated more thoroughly to see if it can be funded and implemented. This MPB can be revised accordingly if the cattle grid option becomes feasible, but meanwhile, fencing options, including sheep plus electric fencing which has been very successful in 2017) are the only choice in practical terms.

4.4 Install buried ring fence as funded by Natural England and fit “smart collars” to Highland cattle kindly provided by local farmer(s) and/or other sources. (If this ideal fencing type does not materialise, use mobile electric fencing, especially for sheep.)

4.5 Check and maintain collars and fencing to ensure the system remains in good working order at all times. If above-ground electric fencing is used, additionally fit warning signs and crossing places on footpaths.

Establishing an appropriate and permanent grazing/cutting regime to maintain FCS of desired habitats.

4.6 Graze Areas B, D and G permanently, avoiding poaching/over-grazing but with enough animals (including sheep, geese, *etc.* as well as cattle) to deter the tufted hair-grass *Deschampsia caespitosa*). Check any undesirable scrub and promote petty whin, encouraging it to spread and watching that it is not adversely affected. (Cordon off if necessary, but do not allow other vegetation to grow up and choke it.)

4.7 Maintain the remainder of the Green (except splays and verges – see below) as species-rich hay meadow by cutting annually in September to a sward height of 10cm or so after seeds have fallen. Remove all arisings and compost those not taken away as hay – define and set aside a composting area. Alternatively, burn (see above) or otherwise dispose of. Grazing of the aftermath or "early bite" may be carried out to advantage in October/November or March/April. Some corners may usefully be allowed to remain uncut, as long as kept free of scrub, to develop a tussocky grassland habitat.

4.8 Cut road verges and traffic splays to maintain a sward below about 15cm (two to three cuts between April and October)[5]. **Remove all arisings after each cut. Do not mulch mow.** Dispose of as above. *NB.* Arisings were not satisfactorily removed in 2017.

Halting and reversing excessive hydroseral succession in ponds, clearing all ditches to returning them to functional drainage.

Before starting work on any ponds or ditches, check with an ecologist to confirm the details of procedure and any licensing needs.

4.9 Restore all ponds on the Green to check the excessive hydroseral succession over a four-year cycle of aquatic/emergent vegetation (25% per year). Ponds 2, 3 and 4 will require more intensive clearance in Year 1 to deepen them to about 0.5–1m with lekking areas and with basins up to about 1.5m deep, and remove 60-80% of emergent vegetation as they have become very choked. Stack extracted material neatly at side of ponds to allow small fauna to escape back to the water. Manage hydroseral succession and excessive shading of pond marginal vegetation by

[5] It is also suggested that necessary paths and accesses to frontagers are mown similarly to verges and splays — but not as lawns that are so short as to discourage forbs such as primroses and cowslips.

cutting/coppicing in Year 1, then on rotation every two years approximately. Do not treat stumps near water with herbicide. Monitor ponds for pollution/unacceptable eutrophication and take remedial action if required.

4.10 Divide site into three logical flow sections[6] and, over three years, clear out all ditches, connecting pipes and culverts (some pipes may need repairing) so that flow is reinstated. Spread dredgings neatly along ditch tops so that aquatic/mesic fauna and vegetative propagules are preserved as far as possible.

4.11 Check annually that ditches are flowing; clear if necessary.

4.12 Cap the well (south-western sector of site, marked on the management plan figure in the Annexes) and erect a simple, low post-and-rail fence around it.

Ongoing management, communication, recording and monitoring.

4.13 Keep heavy vehicles and machinery that may create ruts or cause damage to the sward off the Green.

4.14 Report and take action against any persons causing a nuisance, including fly tipping, littering or dog fouling that is not cleared away by the owner.

4.15 Set up a web site/Facebook page to disseminate information about Monkwood Green and where people can post their observations and photographs. Include a Biological Recording Programme[7] to increase knowledge of the species on site. This may be linked to the Worcestershire Biological Records Centre. Encourage school and university educational projects and research on the Green.

4.16 Make an inspection visit to monitor the application of this MPB in every season and prepare a brief report (ideally posted to the web site). Action matters that come to light from these reports as far as practically possible to maintain FCS. Keep a watch for adverse trends and any ecologically harmful IAS. (For example, New Zealand pygmyweed *Crassula helmsii* has been seen in the area and the ponds should be watched for this as it can smother more fragile native mesic species.)

6 East of Sinton Green Road, west of Sinton Green Road but north of Whitehouse Farm Road, and south of Whitehouse Farm Road are suggested.

7 A template is available.

Prescription

5 Prescription

5.1 Table 2 below summarises the operational prescriptions for the projects listed in the previous paragraphs. More detail can be found in the Annexes to this MPB (Section C) or obtained from the author.

A Note on Funding

This MPB has been written with limited resources in mind but it is clear that, whilst some work can be undertaken by volunteers and through the good offices of organisations such as the Duckworth Trust, external funding will be required if progress is to be made. Ideally, funding for a permanent full-time Conservation Officer/Warden should be found, plus money for dredging, scrub clearance and mowing operations. A permanent post would probably cost the Parish Council about £16,000[8] per annum, depending on hours worked. Employing supplementary contractors could well amount to as much again in the first two to three years, with mowing and some lesser pond/ditch work continuing after that, so recent volunteers' input has been greatly appreciated.

Natural England may fund stock fencing, but their funds have recently been severely cut. Beyond that, monies above those which the Parish Council can presently provide will need to be sought through grant aid or possibly some form of levy.

There are several bodies who could be approached, including the Heritage Lottery Fund (https://www.hlf.org.uk/) with whom many applicants have had success. Another is the Landfill Communities Fund (ENTRUST) at http://www.entrust.org.uk/. The Environmental Funders Network (http://www.greenfunders.org/about/) may be able to suggest sources and contacts. The UK Government's Countryside Stewardship scheme also has potential – see, for example, http://tinyurl.com/ze7oa84. Other possibilities are some kind of county or local levy, an application to the EU LIFE programme http://ec.europa.eu/environment/life/ if the unwise decision to leave the EU is reversed, fund-raising events, an appeal, *etc.* Brief comments about cost magnitude are in the last column of the following Prescription Table.

With wild species in major trouble globally, populations having halved in forty years according to WWF International, protecting our biological diversity and the ecosystem services it delivers is arguably the most important thing humans have to do to prevent irreversible environmental mayhem[9]. In the UK, conservation, like charity, starts at home, and arresting the degradation of ecologically rich sites such as Monkwood Green should be at the very top of the local political agenda. Having in mind also that the UK has signed up to halting the loss of biodiversity by 2010, such projects should never be struggling for funds and other resources.

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[8] *Plus all the usual employer's overheads and taxes.*

[9] See *e.g. State of Nature* (2013) and McLellan (2014).

Table 2: Project list and summary prescription (see previous section for full text) with details of the programme of work, including season when work should be carried out, frequency (no. of times per year) of operations and responsibility, as appropriate. The programme is projected to commences in 2016 (= Year 1).

KEY: A = Autumn, W = Winter, Sp = Spring, Su = Summer GPA = Grimley Parish Council, NE = Natural England/DEFRA, C = Contractor, E = Ecological Scientist(s), V = Volunteer(s)/Residents Association, H = Herdsman, £ (end column) remarks on cost/funding.

PROJECT	PRESCRIPTION	YEAR(S)	SEASON	FREQ. (per year)	RESPONSIBILITY	£ COMMENT
Clearance and control of encroaching scrub.	Complete clearance of excessive scrub and stump treatment. Areas A and B: thin and push back scrub towards the wood by 75% to leave scalloped edge, treating cut stumps with Roundup® Tree Stump and Root Killer painted within 1 hour of cutting. Retreat any stumps that re-sprout with glyphosate.	1–3	A/W	—	C/V	Ideally needs contractor help.
4.1	Areas C and D: thin out scrub by 75% and treat cut stumps as Areas A & B; review trees in Area D, marking for removal smaller unsuccessful planted ones and those overcrowding the finer specimens. Generally keep those with mistletoe.	1–3	A/W	—	C/V	Ideally needs contractor help.
	Area G: remove 75% of scattered scrub and all tree saplings (but not mature/semi-mature trees) from wider grassland and treat stumps as above.	1–3	A/W	—	C/V	Ideally needs contractor help.
4.2	Stack cut brash neatly and allow to rot down. (Excessive brash may be burned but only on areas without grass sward.)	1–3	A/W	—	V(C)	Residents group should be able to do.
4.3	Monitor stumps and re-treat where necessary.	Permanent	Sp/Su	1	V	Minimal cost
Installing suitable facilities to contain grazing animals.	**Please see main text above regarding cattle grids (ideal option but potential time and money constraints).**					
4.4	Install buried ring fence as funded by Natural England and fit “smart collars” to Highland cattle. (If this ideal fencing type does not materialise, use mobile electric fencing).	1	Sp	—	GPC/NE	Should be no cost if NE fund.

PROJECT	PRESCRIPTION	YEAR(S)	SEASON	FREQ. (per year)	RESPONSIBILITY	£ COMMENT
4.5	Check and maintain collars and fencing to ensure the system remains in good working order at all times.	Permanent	Any	As needed	H	Should be trouble-free.
	If above-ground electric fencing is used, additionally fit warning signs and crossing places on footpaths.	1	Sp	—	GPC/H	May be cost if no funding.
Establishing an appropriate and permanent grazing/cutting regime to maintain FCS of desired habitats.						
4.6	Graze Areas B, D and G permanently, avoiding poaching/over-grazing.	Permanent	—	—	H	No cost anticipated.
	Check undesirable scrub and protect/promote petty whin (cordon off if necessary, but do not allow other vegetation to grow and choke it).	Permanent	Sp Su	Monthly in Sp & Su	V/E	No cost anticipated.
4.7	Maintain remainder of Green (except splays and verges – see below) as species-rich hay meadow by cutting annually in September to a sward height of *ca.* 10cm after seeds have fallen.	Permanent	Late S or early A	1	C	Contractor cost.
	Remove all arisings and compost/burn/otherwise dispose. Graze aftermath/early bite in October/November or March/April.	Permanent	As appropriate	—	C H	Some contractor cost (with cutting).
	Leave some corners uncut to develop a tussocky grassland habitat.	Permanent	—	—	C	No cost.
4.8	Cut road verges and traffic splays to maintain sward below *ca.*15cm (two to three cuts between April and October). **Remove all arisings after each cut. Do not mulch mow**. Dispose of as above.	Permanent	Sp Su A	2 to 3	C	Contractor cost

PROJECT	PRESCRIPTION	YEAR(S)	SEASON	FREQ. (per year)	RESPONSIBILITY	£ COMMENT
Halting and reversing excessive hydroseral succession in ponds, clearing all ditches to returning them to functional drainage.	**Before starting work on any ponds or ditches, check with an ecologist to confirm the details of procedure.**					
4.9	Restore all ponds over four-year cycle (25% per year) but see below for Ponds 2–4).	1–4 then as needed	A/W	1	C/V	Best with machine with reach/bucket.
	Intensively clear Ponds 2, 3 and 4 to deepen to *ca.* 1m with lekking areas and basins up to 1.5m deep, removing 60-80% of emergent vegetation.	1	A/W	—	C	Will need machine.
	Stack extracted material neatly at side of ponds.	After any works	A/W	—	C/V	Easiest with machine.
	Manage hydroseral succession and excessive shading y cutting/coppicing woody vegetation in Year 1, then on rotation every two years approximately. Do not treat stumps near water with herbicide.	1 then as needed	A/W	—	C/V	Volunteers should manage after initial heavy work.
	Monitor ponds for pollution/unacceptable eutrophication and take remedial action if required.	Permanent	Each season if possible	1–4	V/E	Part of general monitoring.
4.10	Divide site into three flow sections as text above; over three years, clear out all ditches, connecting pipes and culverts (some pipes may need repairing) so that flow is reinstated.	1–3	A/W	—	C/V	Machine needed and contractors to repair pipes.
	Spread dredgings neatly along ditch tops.	1–3	A/W	—	C/V	Machine best.
4.11	Check annually that ditches are flowing; clear if necessary.	Permanent	A/W/Sp	1	V	—
4.12	Cap the well and erect a simple, low post-and-rail fence around it.	1–2	Any	—	C	Should not be very expensive; obtain quotes locally

PROJECT	PRESCRIPTION	YEAR(S)	SEASON	FREQ. (per year)	RESPONSIBILITY	£ COMMENT
Ongoing management, communication, recording and monitoring.						
4.13	Keep heavy vehicles and machinery that may create ruts or cause damage to the sward off the Green.	Permanent	All	—	GPC	—
4.14	Report and take action against any persons causing a nuisance, including fly tipping, littering or dog fouling that is not cleared away by the owner.	Permanent	All	—	GPC	—
4.15	Set up a web site/Facebook page to disseminate information about Monkwood Green and where people can post their observations and photographs.	1–2	—	—	GPC	No cost if existing URL used.
	Biological Recording Programme to increase knowledge of the species on site. This may be linked to the Worcestershire Biological Records Centre.	1–2	—	—	E GPC	No cost if linked to GPC web site.
	Encourage school and university educational projects and research on the Green.	Any	Sp Su A mainly	—	GPC	No cost envisaged.
4.16	Inspections to monitor MPB every season.	Permanent	Each season if possible	Ideally 4	V/E/GPC	No cost envisaged.
	Prepare a brief report (to post to web site.	Permanent	Any	1	V/E/GPC	No cost envisaged.
	Action matters arising as far as practically possible to maintain FCS.	Permanent	Any	As needed	V/E/GPC	Dependent of circumstances.
	Keep a watch for adverse trends and any IAS.	Permanent	Sp Su A mainly	As needed	V/E/GPC	Dependent on circumstances.

SECTION C: SUPPORTING INFORMATION AND ANNEXES

This section contains:

References and Bibliography
Nomenclature
Abbreviations

Annexes:

Site Description
Site Data
Monitoring Reports & Reviews
Other Supporting Documentation
End Notes — Policies & Statutes

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NOMENCLATURE

Nomenclature of biota is generally treated as follows – please be aware that taxonomy is a dynamic subject and other reference works may be used:

- Tracheophytes (vascular plants): scientific and vernacular names following Stace (2010) and Stace, Preston & Pearman (2015);
- Lichens: scientific names following Smith *et alii* (2009);
- Bryophytes: mosses — scientific names following Blockeel and Long (1998); liverworts — scientific names following Paton (1999);
- Fungi: scientific names with authors as appropriate;
- Invertebrate animals: scientific names with authors as appropriate;
- All other animals: scientific names with authors as appropriate;
- Vegetation communities follow Rodwell (1991 *et seq.*) and/or Bunce *et al*. (1999*).* See also Betts (2002).

ABBREVIATIONS

asap	as soon as possible
BAP	Biodiversity Action Plan (L = local)
BRC	Biological Records Centre
BS	British Standard
CBD	Convention on Biological Diversity
DEFRA	Department for Environment, Food & Rural Affairs
EPS	European Protected Species
ERZ	Ecological Restoration Zone
EU	European Union
FCS	Favourable Conservation Status
GI	Green Infrastructure
ha	hectare(s)
IAS	Invasive Alien Species
LBAP	see BAP above
LNR	Local Nature Reserve
MG	Mesotrophic Grassland *sensu* NVC
MPB	Management Plan for Biodiversity
N/A	Not Applicable
NE	Natural England
NPPF	National Planning Policy Framework
NVC	National Vegetation Classification
PINS	The Planning Inspectorate for England and Wales
sp.	species (plural spp)
ssp.	subspecies (plural sspp)
TBA	To Be Advised or To Be Added
TPO	Tree Preservation Order
WWF	World Wildlife Fund

Not all abbreviations may occur in the main text.

ANNEXES

Site Description (Designatory Papers)
Site Data
Monitoring Reports & Reviews
Other Supporting Documentation
End Notes — Policies & Statutes

SITE DESCRIPTION (DESIGNATORY PAPERS)

COUNTY: HEREFORD & WORCESTER SITE NAME: MONKWOOD GREEN
DISTRICT: MALVERN HILLS SITE REF: 15 WRX
Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.
Local Planning Authority: HEREFORD & WORCESTER COUNTY COUNCIL, Malvern Hills District Council

National Grid Reference: SO 800603 Area: 7.5 (ha.) 18.5 (ac.)
Ordnance Survey Sheet 1:50,000: 138 1:10,000: SO 86 SW, SO 76 SE
Date Notified (Under 1949 Act): 1975 Date of Last Revision: 1975
Date Notified (Under 1981 Act): 1986 Date of Last Revision: –

Other Information:
Site boundary altered (reduction).
Description and Reasons for Notification:
Monkwood Green is an area of permanent rough pasture lying on heavy clay-loam soils to the north-west of Worcester.

The site has been selected as a damp, acidic species-rich grassland of a kind which has become scarce in Worcestershire. Much of the grassland is slightly acidic and dominated by tufted hair-grass *Deschampsia cespitosa*, Yorkshire-fog *Holcus lanatus*, creeping bent *Agrostis stolonifera* and fescues *Festuca* spp. These grasses are associated with herbs such as bird's-foot-trefoil *Lotus corniculatus*, grass vetchling *Lathyrus nissolia*, lady' s bedstraw *Galium verum* and dyer's greenweed *Genista tinctoria*. Some areas of more neutral grassland are also present, with species such as crested dog's-tail *Cynosurus cristatus*, sweet vernal-grass *Anthoxanthum odoratum* and timothy *Phleum pratense*. The western part of the site is damper than the east, with a greater predominance of tufted hair-grass and rushes *Juncus* spp. There are a number of active ant-hills, particularly in the drier grassland, which support herbs such as wild thyme *Thymus praecox* and devil's-bit scabious *Succisa pratensis*.

The site contains a few small areas of dense scrub dominated by western gorse *Ulex gallii*, hawthorn *Crataegus monogyna*, bramble *Rubus fruticosus* agg. and dog rose *Rosa canina*. Of special importance is the presence of petty whin *Genista anglica*, which is more usually found on heaths and moors. This plant, known from only one other site in Worcestershire, here supports an uncommon moth *Coleophora genistae*. The conservation value of the Green is further enhanced by the presence of a pond and a small number of trees including pollarded crack willow *Salix fragilis* and black poplar *Populus nigra* which is uncommon in the county.

<u>Operations likely to damage the special interest</u>
Site name: Monkwood Green
OLD1001146
Ref. No. Type of Operation
1 Cultivation, including ploughing, rotovating, harrowing, and re-seeding.

2 Changes in the grazing regime (including type of stock, intensity or seasonal pattern of grazing and cessation of grazing).
3 The introduction of stock feeding and changes in stock feeding practice.
4 The introduction of mowing or other methods of cutting vegetation and changes in the mowing or cutting regime (including hay making to silage and cessation).
5 Application of manure, fertilisers and lime.
6 Application of pesticides, including herbicides (weed-killers).
7 Dumping, spreading or discharge of any materials.
8 Burning.
9 The release into the site of any wild, feral or domestic animal*, plant or seed.
10 The killing or removal of any wild animal*, other than pest control.
11 The destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, hedge, dead or decaying wood, fungus and turf.
12 The introduction of tree and/or woodland management+ and changes in tree and/or woodland management+.
13a Drainage (including the use of mole, tile, tunnel or other artificial drains).
13b Modification of the structure of watercourses (*e.g.* ditches, dykes, drains), including their banks and beds, as by re-alignment, re-grading and dredging.
13c Management of aquatic and bank vegetation for drainage purposes.
14 The changing of water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes).
15 Infilling of ditches, drains, ponds, pools, marshes.
20 Extraction of minerals, including topsoil, subsoil and spoil.
21 Construction, removal or destruction of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground.
22 Storage of materials.
23 Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.
26 Use of vehicles or craft likely to damage or disturb features of interest.
27 Recreational or other activities likely to damage the grassland and scrub.
28 The introduction of game or waterfowl management and changes in game and waterfowl management and hunting practice.

* 'animal' includes any mammal, reptile, amphibian, bird, fish or invertebrate.
+ including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.

The Physical Environment

Topography and climate

Monkwood green's level topography is only relieved by its ponds and ditches. It lies at some 40m above mean sea level and enjoys a climate moderated by the Gulf Stream effect of the Severn river corridor within the oceanic zone of western Britain. It is further sheltered from north winds by Monkwood which abuts its northern boundary.

Hydrology, geology and soils

There are no natural water courses on Monkwood Green but drainage is *via* a network of ditches (see main text) into ponds on the Green and connected to the wider drainage network of Monkwood.

The Soil Survey of England and Wales (1983) defines the Green's soil as non-calcareous loams over clay (BROCKHURST Series), slowly permeable and liable to waterlogging. The latter is certainly the case but the author's observations from the vegetation suggest a higher calcium ion content. Perhaps circumneutral is the best description of *p*H. Underlying clay is several metres deep.

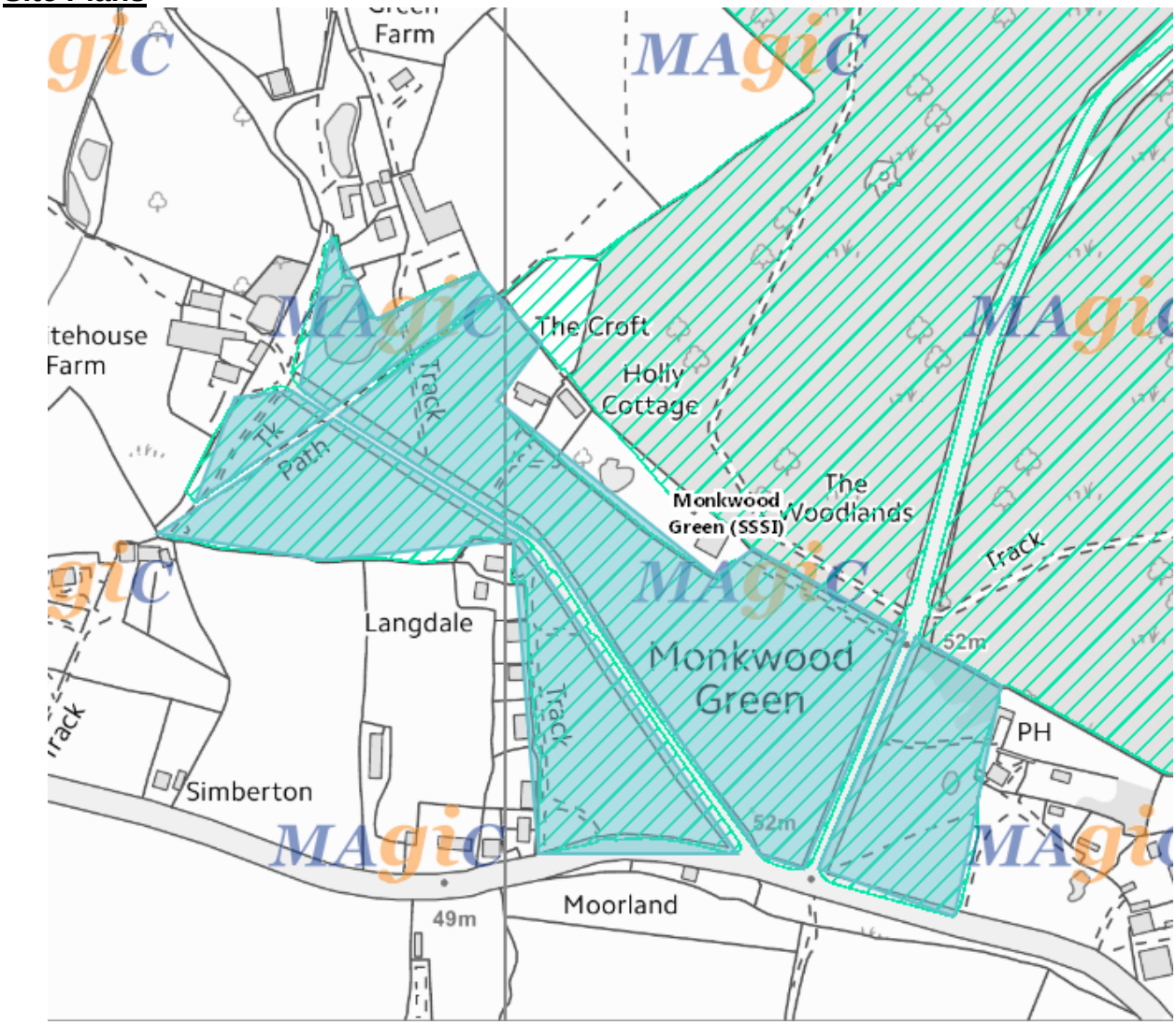
Current studies of soil biota DNA are under way in collaboration with an international research group at Seoul National University. Samples have been taken with permission of GPC and NE but presently results are delayed due to congestion in the DNA analysis laboratory at the University of Warwick.

The Biological Environment

Special. Please see the SSSI designatory papers, species lists, *etc.*

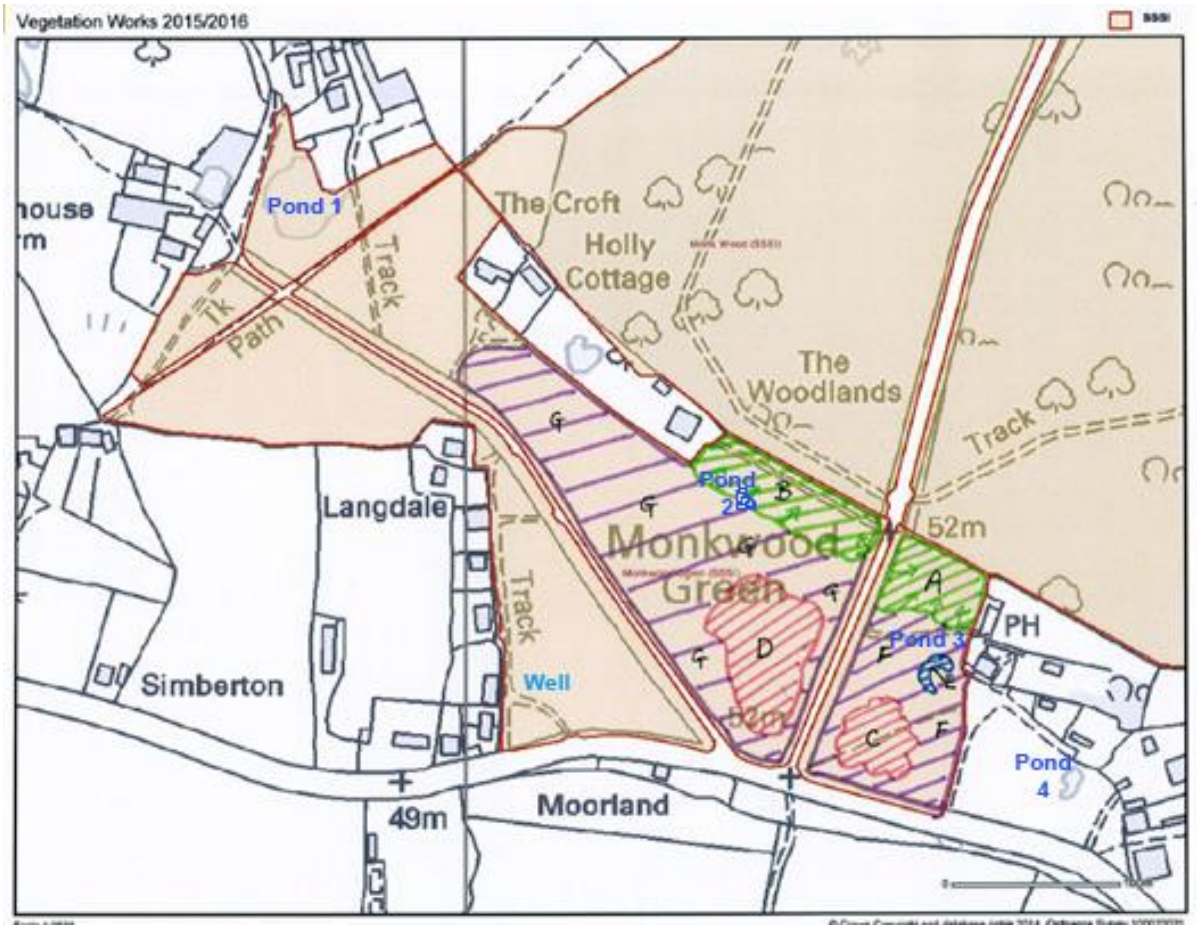
SITE DATA

Site Plans



Plan accompanying Monkwood Green SSSI designation papers (from www.magic.gov.uk/).

Approximate extent of SSSI (red lines) and other undesignated parts of Monkwood Green (white lines) overlain on satellite image (© Google, thank-you.)



Plan of Monkwood Green showing the management areas A–G and ponds 1–4 and well as described in main text.

Photographs

Below are a few photographs to give a flavour of the site. It is hoped that visitors and residents will take many.

From top: betony, sneezewort, dyer's greenweed among anthills, species-rich grass sward with lady's bedstraw, purple thorn, eyed hawk-moth, petty whin.

Biological Database

Species lists

Botany

Flora of Monkwood Green SSSI Recorded by John J Day. The date of the printing on the records sheet is May 1969 but this is not the recording date which John unfortunately did not note. I (CJB) think it was between 1987 and 1995. I have added some records of my own. Bryophytes are under-represented and need survey, as do lichens (and fungi).

Key:
x = hedgerow/woodland species; A = abundant; F = frequent/common; O = occasional; R = rarely occurring; L = locally; V = very; agg. = in aggregate.

Acer campestre x
Acer pseudoplatanus x
Achillea millefolium F
Achillea ptarmica F
Aegopodium podagraria R
Agrimonia eupatoria O
Agrostis canina LF
Agrostis stolonifera F
Agrostis tenuis (= *A. capillaris*) F
Ajuga reptans O/R
Alliaria petiolaris x
Allium vineale R
Alopecurus myosuroides R
Alopecurus pratensis F
Anacamptis morio LF (increasing)
Anemone nemoralis R (and x)
Angelica sylvestris R
Anisantha sterilis R
Anthoxanthum odoratum A
Anthriscus sylvestris O
Aphanes arvensis O
Arctium agg. R
Artemisia vulgaris R
Arum maculatum R (and x)
Barbarea vulgaris O
Bellis perennis LF
Betula verrucosa (= *B. pendula*) R
Brachythecium rutabulum F
Brachypodium sylvaticum R
Briza media O
Bromus mollis (= *B. hordeaceus* ssp. *hordeaceus*) F
Calamagrostis epigejos R
Calliergonella cuspidata LF
Callitriche agg. R
Calluna vulgaris R (single)
Capsella bursa-pastoris R
Cardamine flexuosa R
Cardamine pratensis F
Carduus crispus ssp. *multiflorus* (third party record)
Carduus nutans (third party record)
Carex caryophyllea LF
Carex flacca F
Carex hirta F
Carex nigra F
Carex otrubae O
Carex panicea F
Carex remota R
Carex sylvatica x
Centaurea nigra O/F
Cerastium glomeratum O/R
Cerastium vulgare (= *C. fontanum*) F
Chaerophyllum temulentum R
Chamerion angustifolium R
Chrysanthemum leucanthemum (= *Leucanthemum vulgare*) O
Cirsium arvense LF
Cirsium palustre F
Cirsium vulgare O
Conopodium majus R
Coronopus squamatus O/F
Corylus avellana R
Crataegus monogyna O/F
Crataegus laevigata (recorded CJB 1986 R x)
Crepis taraxacifolia (= *C. vesicaria* ssp. *taraxacifolia*) R
Cynosurus cristatus F
Dactylis glomerata F
Danthonia decumbens O
Daphne laureola x
Daucus carota O
Deschampsia cespitosa F
Digitalis purpurea R (and x)
Dryopteris filix-mas R
Dryopteris spinulosa (= *D. carthusiana*) R
Endymion non-scriptus (= *Hyacinthoides non-scripta*) R (and x)
Epilobium adenocaulon (= *E. ciliatum*) O
Epilobium hirsutum LF
Epilobium montanum LF
Epilobium parviflorum R
Eranthis hyemalis (recorded by CJB 1990 R)
Erodium cicutarium (third party record)
Euphorbia amygdaloides x
Festuca gigantea x
Festuca ovina LF
Festuca pratensis F
Festuca rubra F
Fraxinus excelsior R
Fritillaria meleagris (recorded by CJB 2013 R increasing – escape)
Fumaria officinalis R
Galium aparine O
Galium hercynicum (= *G. saxatile*) (third party record)
Galium mollugo O/R
Galium palustre LF

Galium verum F
Genista anglica O/LF
Genista tinctoria O/LF
Geranium dissectum O
Glechoma hederacea R
Glyceria fluitans LF
Gnaphalium uliginosum (third party record)
Hedera helix R (and x)
Heracleum sphondylium R
Hieracium pilosella (= *Pilosella officinarum*) LF
Holcus lanatus LF
Hypericum humifusum R
Hypericum pulchrum (third party record)
Ilex aquifolium x
Juncus acutiflorus F
Juncus articulatus F
Juncus bufonius O
Juncus conglomeratus F
Juncus effusus F
Juncus inflexus F
Kindbergia praelonga F
Lamium album O
Lamium purpureum R
Lapsana communis R
Lathyrus nissolia R
Lathyrus pratensis F
Leontodon autumnalis O
Leontodon hispidus R/LF
Linum catharticum O
Lolium perenne LF
Lonicera periclymenum O
Lotus corniculatus F
Lotus uliginosus O/LF
Luzula campestris F
Luzula multiflora LF
Lysimachia nummularia R
Malus sylvestris R (and x)
Malva sylvestris R
Matricaria chamomilla R
Matricaria matricarioides (= *M. discoidea*) O
Medicago lupulina O
Melampyrum pratense (third party record)
Myosotis arvensis R
Myosotis palustris (= *M.* scorpioides) O
Nardus stricta F
Odontites verna O/F
Ophioglossum vulgatum R
Orchis fuchsii (= *Dactylorhiza fuchsii*) O
Pedicularis sylvatica F
Peplis portula (= *Lythrum portula*) LF
Phleum pratense F
Pimpinella saxifraga R
Plantago lanceolata F
Plantago major F
Poa annua F
Poa nemoralis R
Poa pratensis F
Poa trivialis LF
Polygala serpyllifolia O/R
Polygonum aviculare LF
Populus nigra R
Potentilla anglica O (recorded September 2017)
Potentilla anserina F
Potentilla erecta LF
Potentilla reptans F
Primula veris R
Primula vulgaris R
Prunella vulgaris F
Prunus spinosa x
Quercus robur O
Ranunculus acris F
Ranunculus aquatilis R
Ranunculus bulbosus F
Ranunculus ficaria O/F
Ranunculus flammula F
Ranunculus repens O/LF
Rhinanthus minor agg. LA
Rhytidiadelphus squarrosus LF
Ribes uva-crispa x
Rorippa islandica (third party record – not confirmed in Flora of Worcestershire)
Rosa arvensis O (and x)
Rosa canina R
Rubus fruticosus LF
Rumex acetosa F
Rumex conglomeratus LF
Rumex crispus R
Rumex obtusifolius R
Rumex sanguinea LF
Sagina procumbens R
Salix caprea O
Salix fragilis R
Sambucus nigra R
Senecio aquaticus (third party record)
Senecio erucifolius O
Senecio jacobaea R
Senecio vulgaris O
Silaum silaus O/F
Sison amomum LF
Solanum dulcamara O
Sonchus asper LF
Sonchus oleraceus LF
Stachys officinalis O/LF
Stachys sylvatica R
Stellaria graminea O
Stellaria holostea R
Stellaria media R
Succisa pratensis O/R
Taraxacum officinale O/F
Teucrium scorodonia R
Thymus drucei (= *T. polytrichus*) F
Torilis japonica R
Trifolium dubium F
Trifolium medium R
Trifolium micranthum R
Trifolium pratense F
Trifolium repens O/LF
Ulex europaeus LF
Ulex gallii R
Ulmus procera x
Urtica dioica O
Veronica chamaedrys O
Veronica officinalis LF
Veronica polita O
Veronica serpyllifolia F
Vicia angustifolia O
Vicia cracca R
Vicia sativa O/LF
Vicia sepium O/LF
Vinca major recorded by CJB 2015 VLF
Viola odorata R
Viola riviniana O
Zerna ramosa (= *Bromopsis ramosa*) R

Mammals

Hedgehog F (decreasing)
Mole F
Common shrew O
Noctule O/F
Pipistrelle F (probably common and soprano)
Brown long-eared bat F (other bats also – need survey)
Rabbit F
Brown hare O/F
Grey squirrel F
Bank vole F
Field vole F
Yellow-necked mouse O/F
Wood mouse F
Brown rat F
Dormouse (adjacent hedgerows)
Fox F
Stoat O/F
Weasel R
Badger O/F
Fallow deer R
Muntjac F

Birds

* = not seen for >10 years

Grey heron F
Mute swan (breeds on Pond 1)
Mallard F
European sparrowhawk O
Common buzzard F
Northern goshawk O (associated with Monkwood)
Common kestrel F
Hobby R
Peregrine falcon O (kills & overflying)
Red-legged partridge O/F
Common pheasant F
Common moorhen F
Common coot O
Lapwing O
Woodpigeon F/A
Collared dove F
Stock dove F
Turtle dove *
Eurasian cuckoo O
Barn owl O/F
Little owl *
Tawny owl F
Eurasian swift O/F
River kingfisher R
Green woodpecker F
Great spotted woodpecker F
Lesser spotted woodpecker R
Skylark*
Barn swallow O/F
Meadow pipit F
Pied wagtail O/F
Norther wren F
Hedge accentor F
European robin F
Blackbird F
Fieldfare O
Redwing O
Song thrush O
Mistle thrush F
Blackcap F
Chiffchaff O

Spotted flycatcher *
Marsh tit O/F
Willow tit O/F
Coal tit F
Blue tit A
Great tit A
European nuthatch F
Common treecreeper O
Long-tailed tit O/F
Jay F
Common magpie F
Carrion crow F
Rook O
Jackdaw F
Common starling F (decreasing)
House sparrow F (decreasing)
Chaffinch F
Greenfinch F (decreasing)
European goldfinch F
Northern bullfinch O
Yellowhammer O/F
Reed bunting O

Herpetofauna

Common frog F
Common toad F
Great crested newt F
Smooth newt F
Slow-worm F
Grass snake F

Fish

No fish are known in the ponds. It is possible but unlikely that Pond 1 has a fish population and there are no confirmed observations.

Entomology

We have thirty years of records of photophilic moths from light trapping but species are not differentiated between Monkwood, garden and grassland (the Green) habitats. Further surveys are required many orders including *EPHEMEROPTERA* (mayflies), *ODONATA* (dragonflies), *ORTHOPTERA* (grasshoppers, crickets), *DERMAPTERA* (earwigs), *HEMIPTERA* (bugs), *NEUROPTERA* (lacewings), *COLEOPTERA* (beetles), *TRICHOPTERA* (caddisflies), *DIPTERA* (true flies) and *HYMENOPTERA* (bees & wasps). Worms and various soil organisms require attention, as do gastropods and the smaller aquatic organisms of the ponds and ditches. There is plenty to occupy the enthusiastic amateur.

Below are some of the casual records made of interesting/notable invertebrates of Monkwood Green.

Coleophora genistae (micro-moth on petty whin)
Leptophyes punctatissima speckled bush-cricket
Lampyris noctiluca glow-worm
Panorpa communis scorpionfly

Butterflies and day-flying moths recorded on Monkwood Green include brimstone butterfly, brimstone moth, cinnabar moth, comma, common blue, five- and six-spot burnet moths, gatekeeper, grass rivulet, large skipper, large white, latticed heath, meadow brown, orange-tip, painted lady (some years), peacock, red admiral, ringlet,

silver-Y moth, small copper, small heath, small tortoiseshell, small white, small white wave, speckled wood, treble-bar moth.

Habitats and vegetation

Please see SSSI designation sheets and main text.

Techniques and prescription details

TBA

Further surveys and studies

TBA

MONITORING REPORTS AND REVIEWS

TBA

OTHER SUPPORTING DOCUMENTATION

NCC (now Natural England) management plan standard project checklist. This dates from 1988 but is still a very useful reference for site managers.

Other supporting information TBA as needed.

NCC 1988/ ENGLISH NATURE FULL CHECKLIST FOR STANDARD NATURE RESERVE PROJECTS[10]

(***NB***. This is a list originally compiled by the Nature Conservancy Council (lately English Nature, Natural England). All sites are different, so projects on it will need to be tailored to the particular circumstances and requirements. Items on the list do not necessarily agree with or conform to recommendations, suggestions or policies of Betts Ecology but are provided as a structured basis of ideas for work planning and an *aide memoire*.)

RECORDS — projects relating to the collection and collation of information

Use the following second digit for physical, flora and fauna records

R__1 Natural event
R__2 Survey
R__3 Monitor
R__4 Count/estimate/measure/census
R__5 Research project
R__6 List species

Archive General, including bibliography, photographic and map coverage

RV00 List/collect references, published and unpublished
RV10 List/collect photographs, ground
RV20 List/collect/commission photographs aerial
RV30 List/collect maps
RV40 Survey site, base. map features

[10] **Nature Conservancy Council (1988)**. *Site management plans for nature conservation — a working guide.* NCC, Peterborough, UK.

RV50 List/collect records, archival
RV51 Collect press cuttings

Physical Description of the physical environment

RP00 Collect data, climatological
RP10 Collect data, hydrological
RP20 Collect data geological
RP30 Collect data, geomorphological
RP40 Collect data, pedological

Flora & Fungi Description of the vegetation

RF00 Collect data, vegetation
RF10 Collect data, trees/shrubs
RF20 Collect data, other vascular plants
RF30 Collect data, bryophytes
RF40 Collect data, algae
RF50 Collect data, lichens
RF60 Collect data, fungi

Fauna Description of the fauna

RA00 Collect data, mammals
RA10 Collect data, birds
RA20 Collect data, herpetofauna
RA30 Collect data, fish
RA40 Collect data, *LEPIDOPTERA*
RA50 Collect data, *ODONATA*
RA60 Collect data, *ORTHOPTERA*
RA70 Collect data, other/general insects
RA80 Collect data, other/general invertebrates

Human impact Effects of people and their activities, including archaeology and historical and contemporary land use

RH00 Collect data, archaeological
RH10 Collect data, land use history
RH20 Collect data, past conservation management
RH30 Collect data, public, research
RH40 Collect data, public use, education
RH41 Count educational groups
RH50 Collect data, public use, recreation
RH51 Count visitors
RH60 Collect data, public use, trespass/theft/damage
RH70 Collect data, public use, unplanned/undesirable activities
RH71 Collect data, fires, unplanned
RH80 Collect data, management, by owners/tenants/public
RH90 Collect data, other activities, by owners/tenants/public bodies/neighbours

MANAGEMENT — projects relating to the practical implementation of management decisions

Wardening — visitor guidance and control, liaison and general PR work

Wardening — information Education of and advice to the visiting public

MI00 Inform public, off site
MI10 Inform visitors, general
MI20 Inform visitors, educational
MI30 Inform visitors, specialist
MI40 Inform visitors, recreational
MI50 Provide interpretive material

Wardening — liaison Contact with owners, neighbours, *etc*.

ML00 Liaise, owners/occupiers
ML10 Liaise, commoners
ML20 Liaise, right-holders
ML30 Liaise, neighbours
ML40 Liaise, local/national authorities
ML50 Liaise, local community/groups
ML60 Liaise, emergency services
ML70 Liaise, media
ML80 Liaise, others

Wardening — patrol Routine inspection and policing

MP00 Protect site/species by patrol

Estate — practical aspects (physical input) of site management

Estate — habitat manipulation Management of habitats

Manage habitat, woodland-scrub by:
MH00 coppicing
MH01 planting/sowing
MH02 thinning/group felling
MH03 assisting natural regeneration
MH04 ride/path/glade maintenance
MH05 non-intervention
MH06 enclosure/exclusion
MH07 scrub control
MH08 clearing dead wood
MH09 other activities

Manage habitat, grassland, by:

MH10 controlled grazing
MH11 controlled burning
MH12 mowing
MH13 sowing/planting/turf laying
MH14 scrub control
MH15 non intervention
MH16 enclosure/exclusion
MH19 other activities

Manage habitat, bracken - tall herb, by:

MH20 controlled grazing
MH21 controlled burning
MH22 mowing/selective cutting
MH23 enclosure/exclusion
MH24 non-intervention
MH25 spraying
MH29 other activities

Manage habitat, lowland/upland heath, by:

MH30 controlled grazing
MH31 scrub/tree control
MH32 mowing
MH33 fire prevention control
MH34 enclosure/exclusion
MH35 cultivation to accelerate leaching
MH36 non-intervention
MH37 controlled burning
MH39 other activities bodies/neighbours

Manage habitat, bog/mire/flush, by:

MH40 water level control
MH41 controlled grazing
MH42 tree/scrub control
MH43 enclosure/exclusion
MH44 fire prevention/control

MH45 visitor control
MH46 non intervention
MH49 other activities

Manage habitat, swamp/fen/inundation, by:
MH50 water level control
MH51 planting/seeding
MH52 scrub clearance
MH53 mowing
MH54 controlled grazing
MH55 excavation
MH56 non-intervention
MH57 ditch/dyke maintenance
MH58 controlled burning
MH59 other activities

Manage habitat, open water, by:
MH60 water level control
MH61 excavation
MH62 plant introduction
MH63 pollution prevention
MH64 clearing/dredging/re-profiling
MH65 clearing surrounding vegetation
MH66 non-intervention
MH69 other activities

Manage habitat, coastal, by:
MH70 visitor control
MH01 planting/stabilisation
MH72 scrub control
MH73 mowing
MH04 controlled grazing
MH75 non-intervention
MH06 enclosure/exclusion
MH07 ditch/dyke maintenance

MH07 controlled burning
MH79 other activities

Manage habitat, rock, by:
MH80 soil removal
MH81 excavation
MH82 cutting vegetation
MH13 visitor Control
MH84 grazing control
MH85 scrub clearance
MH06 removal of debris
MH87 non-intervention
MH89 other activities

Manage habitat, marine, by:
MH90 visitor control
MH91 fishing control
MH92 pollution control
MH93 non-intervention
MH99 other activities

Manacle habitat, artificial, by:
MA00 planting/sowing/turf laying/ propagating
MA01 mowing/harvesting/selective cutting
MA02 weed control/spraying
MA03 pest control
MA04 felling/cutting/pruning/clearing
MA05 path maintenance
MA06 fertilising
MA07 ploughing
MA09 other activities

Species manipulation Management of species

MS00 Manage species, tree/shrub
MS10 Manage species, other vascular plant
MS20 Manage species, lower plant
MS30 Manage species, mammal
MS40 Manage species, bird
MS50 Manage species, herpetofauna
MS60 Manage species, fish
MS70 Manage species, *LEPIDOPTERA*
MS80 Manage species, other insect
MS90 Manage species, other invertebrate

Estate — estate fabric work and the upkeep of the estate fabric

ME00 Protect site, by providing boundary structures
ME10 Protect site, by maintaining boundary structures
ME20 Equip site, by providing other structures
ME30 Equip site, by maintaining other structures
ME40 Maintain site, by removing unwanted structures/rubbish
ME50 Protect site, by implementing fire plan
ME60 Protect site, by controlling erosion/dumping/extraction
ME70 Equip site, by providing/maintaining rides/paths (except where part of habitat management)
ME80 Equip site, by providing/maintaining ditches/dykes (except where part of habitat management)
ME90 Protect site, by effecting emergency procedures

Estate — grazing stock Management of domesticated animals

MG00 Husband grazing stock, cattle
MG10 Husband grazing stock, sheep
MG20 Husband grazing stock, ponies

Estate — machinery Acquisition and maintenance of on-site equipment

MM00 Acquire/service vice vehicles/boats
MM10 Acquire/service machinery
MM20 Acquire/maintain tools/equipment

ADMINISTRATION - Servicing and support activities

Notification Notifying as SSSI

AN00 Classify site, conservation value
AN10 Compile package, SSSI
AN20 Renotify site, SSSI, amended
AN30 Denotify site, SSSI
AN40 Register site, SSSI, local land charge

Acquisition/declaration Acquisition or extension of management control and declaration of the site

AA00 Acquire site, by purchase/lease/agreement
AA10 Acquire site, extension, by purchase/lease/agreement
AA20 Augment protection, by *e.g.* purchase of shooting rights
AA30 Declare Nature Reserve, national/local
AA40 De-declare Nature Reserve
AA50 Update information, Estate Terrier

Legal Land Agency matters and payments

AL00 Maintain holding, legal, by *e.g.* renewing lease/agreement: tenancy
AL10 Safeguard title, legal, by *e.g.* closing site/road one day per year

Planning Plan preparation and revision

AP00 Prepare/revise statement, SSSI
AP10 Prepare/revise work programme, SSSI
AP20 Prepare/revise plan, management, reserve
AP30 Prepare/revise. plan, fire protection/control
AF40 Prepare/revise plan, emergency procedure
AP50 Prepare/revise plan, hazards
AP60 Prepare plan, annual work
AP70 Convene meeting, Annual Programme Review
AP80 Convene meeting, Site Management Committee

Site and species safeguard Law enforcement and associated administrative work

AS00 Protect site, NNR/LNR, by promulgating/enforcing bye-laws
AS10 Protect site, by implementing visiting permit system
AS20 Protect site/species, by implementing collecting/research permit system
AS30 Protect site, by preparing evidence
AS40 Protect site, by prosecution, *e.g.* Wildlife and Countryside Act (S.28)
AS50 Protect site/species, by prosecution

Inspection Routine inspections and audits

AI00 Implement inspection, monitoring of SSSI provisions
AI10 Implement inspection, reserve equipment
AI20 Implement inspection, reserve buildings
AI30 Implement inspection, reserve safety

Reports, correspondence and site details General correspondence and routine reports

AR00 Prepare report, project recording forms
AR10 Prepare report, Incident, *e.g.* fire/accident

AR20 Prepare report annual progress
AR30 Prepare correspondence, general
AR40 Record administrative details, *e.g.* staff appointments/ visits
AR50 Record financial details *e.g.* estimate book keeping

Training Management and planning training

AT00 Train staff, use of site planning system
AT10 Train staff, management techniques
AT20 Train staff, use of machinery/equipment

AT30 Train staff, other
AT40 Liaise/supervise staff
AT50 Liaise/supervise voluntary/honorary wardens
AT60 Liaise/supervise voluntary groups

END NOTES – BIODIVERSITY STATUTES

Biodiversity Statutes and related best practice

International

Of the many international agreements (see also under EU below), policies and conventions to which Britain is party, probably the most important is the **Convention on Biological Diversity (CBD)** which has been signed by many countries, including Britain, and came into force in 1993, following the Earth Summit at Rio de Janeiro in 1992. It has three main aims:

1. Conservation of biological diversity;
2. Sustainable use of its (biodiversity's) components, and
3. Fair and equitable sharing of benefits arising from genetic resources.

The UK Government's response to the CBD was the formation of the UK Biodiversity Action Plan (UK BAP – see below). There are regular updates and conferences on this major Convention such as the **Aichi Targets** and there is increasingly enforced regulatory emphasis on upholding the overriding objective to halt the loss of biodiversity, which feeds down to local statutory duty. Latest information may be found at www.cbd.int/. It is worth bearing in mind the five strategic goals:

1. Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society;
2. Goal B: Reduce the direct pressures on biodiversity and promote sustainable use;
3. Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
4. Goal D: Enhance the benefits to all from biodiversity and ecosystem services
5. Goal E: Enhance implementation through participatory planning, knowledge management and capacity building

Europe

The Convention on the Conservation of European Wildlife and Natural Habitats known as the **Bern Convention**. This is an international legal instrument binding on Britain. It has three main aims:

1. to conserve wild flora and fauna and their natural habitats;
2. to promote co-operation between signatory states, and
3. to give particular attention to endangered and vulnerable species including endangered and vulnerable migratory species.

Details at: http://tinyurl.com/36e6wdw.

The **Bonn Convention** on the Conservation of Migratory Species of Wild Animals. This came into force and was ratified by Britain in 1985. Its focus is on threatened mobile species that cross national frontiers in migration or dispersal generally, including many birds and several bats. Details at: http://tinyurl.com/ppdhqvd.

European Union

Readers should be aware that there is likely to be uncertainty about EU matters for some time due to the UK's referendum on membership and consequent changes. Within the EU, there are several

important legislative instruments that have been subsumed into British law or formally adopted by Britain. These include, but are not limited to, the following:

The European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora, known as the **Habitats Directive**. This is presently enforced, and increasingly strictly, in England and Wales by the Conservation of Habitats and Species Regulations 2010. Enforcement in Scotland and Northern Ireland is by instruments applying specifically to those regions. The Habitats Directive confers protection on a large number of habitats and species of community interest. Detailed information may be found at: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm.

European Communities Council Directive on the Conservation of Wild Birds, known as the **Wild Birds Directive**. All birds (excepting a very few derogated pest species or game birds) naturally occurring in the wild in Britain and throughout their natural range in the EU are protected under this legislation which also promotes the creation of Special Protection Areas for particular species under threat. Details at: http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

United Kingdom

In Britain, the **Wildlife and Countryside Act** (1981) was a seminal piece of legislation that now protects hundreds of species and their habitats. It has been updated many times over the decades since it was introduced and is constantly under review, but it remains the principal national legislative instrument in criminal law for protected wild plants, animals and sites. Details at: http://tinyurl.com/blg32gq. Please note that the Act also covers Invasive Alien Species (IAS). This is a rapidly evolving subject with draft provisions for Species Control Agreements and Species Control Orders drawn up by Defra in 2016.

The **UK BAP** (see above and below) was written in 1994 and was a step towards meeting the aims of the CBD highlighting the status of the UK's fauna and flora and a way forward in the conservation of our biodiversity. The UK BAP has been succeeded by the **Post-2010 Biodiversity Framework** which sets out our priorities to meet the challenges of the CBD since the most recent summit in Nagoya in 2010 — this is not a replacement of the BAP but a continuation.

The **Countryside and Rights of Way Act** (CRoW) (2000) and the **Natural Environment and Rural Communities Act** (NERC) (2006). The former is a long and complex piece of legislation in five parts — Access, Rights of Way, Nature Conservation and Wildlife Protection, Areas of Outstanding Natural Beauty, and Town and Village Greens. It is supplementary to the Wildlife and Countryside Act (above) which it strengthens and updates — and it has already been updated itself by the Natural Environment and Rural Communities Act. For the first time, the CRoW Act introduced a statutory Duty on Public Bodies, English Government Departments and the National Assembly of Wales, Local Planning Authorities, *etc.* to have regard to biodiversity conservation in general, and to maintain lists of species and habitats for which conservation steps should be taken or promoted. There is guidance on this from Defra at http://www.gov.uk and, amongst much else, it places Biodiversity Action Plans (BAPs — see above) within a statutory context and, as noted earlier, is aimed at enforcing the implementation of the principles of the CBD. This legislation has strengthened the statutory protection for wild fauna and flora species in making some offences arrestable, with significantly increased search and seizure powers granted to the police and almost all wildlife offences now have heavier fines and even prison sentences. Details at: http://tinyurl.com/kv4rf52a and http://tinyurl.com/nam4hyd. Please be aware there are several other important species-related legal instruments and regulations (**CITES**, **Protection of Badgers Act**, **Conservation of Seals Act**, **Deer Acts**, **Wild Mammals (Protection) Act**, *etc.* covering all or parts of the UK — see also our *Checklist of Legally Protected British Species.*)

Important. The Law Commission has been reviewing wildlife law in England and Wales with a view to consolidating the various disparate statutes into a single cohesive regulatory instrument. The resulting proposed Wildlife Bill will incorporate several changes including a formal definition of

"deliberate" (rather than intentional), changes to disturbance offences, updating of protected species licensing provisions, changes to invasive species clauses and increased penalties in the most serious cases.

In terms of adopted planning policy, the **National Planning Policy Framework** of 2012 places clear responsibility on Local Planning Authorities and those responsible for land-use to aim to conserve and enhance biodiversity and to encourage ecological richness in and around human developments and settlements. The Framework (for detail of which please see the Planning Portal at http://tinyurl.com/q4s4e73) emphasises that moving from a loss of biodiversity to a gain is a clear requirement of sustainable development and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution. The legal basis behind this is included the Natural Environment and Rural Communities Act above. Green Infrastructure planning (see below) that assures ecological connectivity and "space for nature" is thus essential. Important GI protocols for intrinsic and extrinsic habitat connectivity for sites include wildlife corridors such as hedges and streams, and "stepping-stone" habitat patches. Natural England's advice on GI can be accessed at: http://tinyurl.com/l4tdnj9.

Government Circular 06/2005 (jointly with Defra Circular with 01/2005) *Biological and Geological Conservation — Statutory Obligations and their impact within the planning system*) complements the National Planning Policy Framework (see http://tinyurl.com/or25xyr). It places a clear responsibility on Local Authorities to further the conservation of habitats and species of principal importance where a planning proposal may adversely affect them. Furthermore, most local authorities also have supplementary policies which can be found on their web sites.

The Hedgerows Regulations 1997 protect 'important hedgerows' from being removed (uprooted or destroyed). Hedgerows are protected if they are at least thirty years old and meet certain archaeological, historical, ecological or landscape criteria. Please see: http://tinyurl.com/p2za8ov.

Tree Preservation Orders (TPOs) for the protection of notable trees are also available. A guide is available here: http://tinyurl.com/lk8qpc6.

British Standard BS42020: 2013 *Biodiversity — Code of Practice for Planning and Development* sets out standards and guidance on biodiversity and ecology in practice. (Please see more detailed notes above.)

British Standard BS8583: 2015 *Biodiversity — Guidance for businesses on managing the risks and opportunities*. British Standards Institute, London, UK.

Biodiversity 2020: *A strategy for England's wildlife and ecosystem services and Making Space for Nature* (2010): http://tinyurl.com/nunoy89.

Protocols adopted and issued by the relevant professional institutes, particularly the **Chartered Institute for Ecology and Environmental Biology** are also relevant. This latter is now the professional body representing most ecological consultants and practitioners.

Please do be aware in all this that biodiversity legislation, whilst increasingly comprehensive and stringently applied, is complex — even the experts find it difficult. You must not take the above as any more than an attempt to offer useful information in good faith. Always consult a specialist lawyer!

Greenspace & Greenspace Strategies

There is now a considerable literature on this topic. English Nature, the predecessor of Natural England produced guidance and a model for Accessible Natural Greenspace in Towns and Cities that is also relevant to suburban and urban fringe areas and in which it concluded (Land Use Consultants, 2008): "[It was] an approach to promoting nature for the enjoyment of the people … Natural areas … should not be taken as an excuse to neglect the management of existing greenspaces. Natural greenspace requires the long term commitment to skilled management and greenspace managers have a vital role to play in developing the natural potential of the sites under their care and in achieving a high quality, truly multifunctional, greenspace resource for the benefit of local communities."

Building on work in the above and work in the 1990s, Natural England produced an *Accessible Natural Greenspace Standard* (ANGSt) in 2010. "Natural England believes that everyone should have access to good quality natural greenspace near to where they live, *i.e*. "*Nature Nearby*". This provides a broad range of benefits to people and the quality of their lives, covering all the ecosystem services we depend on. *Nature Nearby* is available at http://tinyurl.com/hhzv5lx.

In brief, Natural England has set out three themes in *Nature Nearby* as below (their text):

1. Access to Natural Greenspace Standard (ANGSt).
2. Visitor Service Standards.
3. Greenspace Quality Standard.

1. Access to Natural Greenspace Standard — ANGSt

ANGSt was developed in the early 1990s and was based on research into minimum distances people would travel to the natural environment. Natural England reviewed the standard in 2008 and concluded that the standard was still useful, but that further guidance was required to explain how the standard should be applied. This guidance covers that requirement.

ANGSt is a powerful tool in assessing current levels of accessible natural greenspace, and planning for better provision. It identifies those sites that might be considered natural sites, and areas within other green spaces that have a value for nature, and more importantly it identifies areas of nature deficiency where the standard is not met and where actions may be put in place to address this.
Using these principles, the standard can be applied for:

- protection, enhancement and management of existing green spaces;
- planning new spaces; and
- protecting vulnerable spaces

… at the same time as delivering a wide range of environmental, social and economic benefits.

Assessing current provision against ANGSt will help local authorities to identify where adequate provision is being made for natural green space, and where action needs to be taken to deliver appropriate levels of natural space close to people's homes.

The three underlying principles of ANGSt are:
a) Improving access to green spaces.
b) Improving naturalness of green spaces.
c) Improving connectivity with green spaces.

Natural England is encouraging all local authorities to adopt ANGSt as their local standard because of the essential range of benefits to society that it can deliver:

- Some of these benefits will see a reduction in the cost of other infrastructure, such as land
- drainage, as green spaces fulfill (*sic*) these roles more effectively.
- Other benefits will see reductions in costs of social and health services, as a result of

- improvements to health and well-being.
- Conformity to ANGSt at the higher cross-boundary level will see benefits to biodiversity and the mitigation of adverse climate change effects.

Local authorities are now being asked to demonstrate evidence of the social benefits of investments. The benefits listed above can provide a framework for assessing the social value of investment in natural spaces.

2. Visitor Service Standards

Visitor Service Standards are outlined for three types of natural greenspace:
a) National Nature Reserves;
b) Country Parks;
c) Local Nature Reserves.

These have all been developed in partnership with managers of these sites, and are helping to secure their use and recognition by different and diverse audiences. They promote standards of provision that are equitable and raise the profile of these sites as centres of excellence for both nature conservation and recreation.

3. Greenspace Quality Standards

Natural England, as a sponsor of the Green Flag Award, continues to promote it as the national quality standard for all parks and green spaces. It is transforming the way sites are managed and the approach to service delivery across sites and in time will become as well recognised as the Blue Flag Award for beaches.

Green Infrastructure (GI)
(See also above).

"A network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities." This is a large topic of increasing application in town planning and fundamental to environmental sustainability. It cannot be covered here in detail but we apply it wherever we can in site landscaping and greenspace design & monitoring. For example, Natural England's key recommendations for GI in eco-towns are that it should:

- Be a primary consideration in planning, developing and maintaining an eco-town.
- Be provided as a varied, widely distributed, strategically planned and interconnected network.
- Be factored into land values and decisions on housing densities and urban structure.
- Be accessible to local people and provide alternative means of transport.
- Be designed to reflect and enhance the area's locally distinctive character,
- including local landscapes and habitats.
- Be supported by a green infrastructure strategy.
- Be multi-functional, seeking the integration and interaction of different functions on the same site and across a green infrastructure network as a whole.
- Be implemented through co-ordinated planning, delivery and management that cuts across local authority departments and boundaries and across different sectors.
- Be able to achieve physical and functional connectivity between sites at all levels and right across a town, city or sub-region.
- Be implemented primarily through focused green infrastructure strategies and the spatial planning system of Regional Spatial Strategies and Local Development Frameworks, and it should be formally adopted within these planning policy documents.
- Be established permanently, with financial support for continued maintenance and

adaptation.

(Full text available at: http://tinyurl.com/yev5e45. Natural England general guidance on this topic is at http://tinyurl.com/l4tdnj9.)

A comprehensive good practice guide to GI has been produced by the Town & Country Planning Association and the Wildlife Trusts (Anon. 2012).

Natural Capital

Environmental assets may be considered as Critical Natural Capital (CNC) which is irreplaceable if qualitative and quantitative environmental sustainability is to be achieved, and Constant Natural Assets (CNA) which are environmental features that may be exchanged in issues of land use modification but, if so, there must be no overall loss of resource, *i.e.* there must be direct and full ecological compensation. For convenience, Natural Capital is often used as an overarching term subsuming CNC and CNA as well as ecosystem services.

The UK government's advisory group, the Natural Capital Committee, made nine recommendations in 2016 on how to account for natural capital. These included the creating of a twenty-five-year plan for the environment to help to manage environmental risks and to inform a wide range of decisions. It was recognised that there are challenges to accounting for natural capital including a lack of financial, environmental and social data and the UK's use of other countries' natural capital. The nine recommendations were:

1. The Government should develop a strategy to protect and improve natural capital and the benefits it provides.
2. The Government should assign institutional responsibility for monitoring the state of natural capital.
3. Organisations should create a register of natural capital for which they are responsible and use this to maintain its quality and quantity.
4. The Government should urgently step up action to ensure that the Office for National Statistics (ONS) and the Department for Environment, Food and Rural Affairs (Defra) meet the target of incorporating natural capital into the national accounts by 2020.
5. The National Infrastructure Plan should take account of the impact of NC on each of the main infrastructure sectors.
6. The Government should revise its economic appraisal guidance (HM Treasury Green Book).
7. The Government should drive a substantial, long term interdisciplinary research programme on natural capital to inform future iterations of the strategy.
8. The Government should determine how the plan to protect and improve natural capital is to be funded, drawing on a combination of public and private funding as proposed by the Committee.
9. The Government, working with business, NGOs and other parts of society, should fully develop a 25-year plan

The formal accounting of natural capital requires an agreed protocol and by the end of 2016 the basics, developed with the help of The Royal Society for the Protection of Birds and PwC, became available (see Houses of Parliament Parliamentary Office of Science & Technology POSTnote 542 of December 2016. Please ask us if you require further details.

Please do be aware in all this that biodiversity legislation, whilst increasingly comprehensive and stringently applied, is extremely complex — even the experts find it difficult. You must not take the above as any more than an attempt to offer useful information in good faith. Always consult a specialist lawyer!

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